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HOLLOMAN AIR FORCE BASE, NEW MEXICO

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Hazardous Waste Bureau
APR 21 2014

Adam Kusmak
Chief, Installation Management
550 Tabosa Avenue
Holloman AFB NM 88330-8458

New Mexico Environment Department
Attn: Mr. John Kieling, Chief
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe NM 87505-6303

Dear Mr. Kieling

Holloman Air Force Base is pleased to submit the Final RCRA Facility Investigation (RFI) Report for 15 of the Group 1 Septic System Sites for your review. This report includes Buildings 308 (OT-C530), 920 921, 922 (OT-C531), 924 (OT-C532), 1190 (OT-C533), 1196 (OT-C535), 1199 (OT-C536), 1200 (OT-C537), 1201 (OT-C538), 1221 (OT-C539), 1251 (OT-C540), 1166 (OT-C542), 1175 (OT-C543), 1176 (OT-C544). The remaining septic sites are undergoing further investigated under a separate contract and will be reported at a later date.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions, please contact me (575) 572-3931 or by email at adam.kusmak@holloman.af.mil.

Sincerely

ADAM M. KUSMAK, GS-13, DAF

4 Attachments:
Final RCRA Facility Investigation (RFI) Reports for 15 of the Group 1 Septic System Sites (Vol 1-4)

cc:

(w/Atch)
Mr. David Strasser
Hazardous Waste Bureau
5500 San Antonio Dr, NE
Albuquerque NM 87109-4127

(w/o Atch)
Mr. Will Moats
Hazardous Waste Bureau
5500 San Antonio Dr, NE
Albuquerque NM 87109-4127

(w/CD)
Mr. Chuck Hendrickson
USEPA, Region 6 (6PD-F)
1445 Ross Ave, Ste 1200
Dallas TX 75202-2750

CB&I
1401 Enclave Parkway, Suite 250
Houston, Texas 77077
Tel: +1 281 531 3100
Fax: +1 281 531 3143
www.CBI.com

Date: December 11, 2013

Project No.: 144106

TRANSMITTAL LETTER:

To: Ms. Stephanie Ramon

Letter No. 144106 - 0130

***Address*:** Environmental Programs Execution
ATTN: AFCEC/EXE Building 171
2261 Hughes Ave, Ste 155
Lackland AFB, TX 78236-9853

Re: ***Final Multiple RFI Reports - Group 1 Volumes I-IV***

Contract No.FA8903-09-D-8580 Task Order No. 0013

For: Review ____ ***As Requested*** ____ ***Approval*** ____ ***Corrections*** ____ ***Submittal*** ___***X***___ ***Other*** ____

Item No:	***No. of Copies***	***Date:***	***Document Title***
Multiple	1 electronic copy	October 2013	**Final, RCRA Facility Investigation Reports Group 1 – Volumes I-IV, Holloman Air Force Base, New Mexico**

Please call with questions or comments. Thank you.

Sincerely:

Christopher Long
Technical Lead

PC: DeAnna Rothhaupt – Holloman AFB (4 hard copies and 4 compact discs)

Final

RCRA Facility Investigation Reports

Group 1 – Septic System Sites
Buildings 308 (OT-C530), 920, 921, 922 (OT-C531), 924 (OT-C532), 1190 (OT-C533), 1196 (OT-C535), 1199 (OT-C536), 1200 (OT-C537), 1201 (OT-C538), 1221 (OT-C539), 1251 (OT-C540), 1166 (OT-C542), 1175 (OT-C543), 1176 (OT-C544)
Holloman Air Force Base, New Mexico

Prepared for U.S. Air Force Civil Engineer Center
2261 Hughes Ave., Suite 155
Lackland Air Force Base, Texas 78236-9861

Prepared by Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

Contract No. FA8903-09-D-8580
Task Order No. 0013
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December 2013

Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)

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Volume II

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RCRA Facility Investigation Report, Group 1 – Building 1221 (OT-C539)
RCRA Facility Investigation Report, Group 1 – Building 1251 (OT-C540)
RCRA Facility Investigation Report, Group 1 – Building 1166 (OT-C542)

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Acronyms and Abbreviations

AFB	Air Force Base
NMED	New Mexico Environment Department
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
Shaw	Shaw Environmental & Infrastructure, Inc. (a CB&I Company)
USACE	U.S. Army Corps of Engineers

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • December 2013

1.0 INTRODUCTION

Shaw Environmental & Infrastructure, Inc. (Shaw), a CB&I company, prepared thirteen Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Reports for the Air Force Civil Engineer Center (formerly the Air Force Center for Engineering and the Environment) under Contract No. FA8903-09-D-8580, Task Order No. 0013, Modification 01. Results presented in these reports are from the investigations of the thirteen Group 1 septic tank sites (originally fifteen sites - one site [OT-C534] was transferred to a separate contract, and a second site [OT-C541] did not contain an existing septic tank or evidence of a former septic tank) under the Midwestern Region Performance-Based Remediation Contract. These RFI Reports have been prepared pursuant to the requirements of the Holloman Air Force Base (AFB) Hazardous Waste Facility RCRA Permit No. NM6572124422 (the Permit) (New Mexico Environment Department [NMED], 2004). All work was performed in accordance with the Holloman AFB Basewide Septic Tank Solid Waste Management Unit RFI Work Plan (U.S. Army Corps of Engineers [USACE], 2010) and the Quality Program Plan (Shaw, 2012). The Quality Program Plan contains the Site Safety and Health Plan; the Uniform Federal Policy–Sampling and Analysis Plan/Quality Assurance Project Plan; and the Construction Quality Plan, which defines the methodology and practices that were used to control construction work during the performance of the RFIs.

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2.0 REFERENCES

New Mexico Environment Department (NMED), 2004, *Resource Conservation and Recovery Act Permit EPA ID# NM6572124422 to U.S. Department of the Air Force for Holloman Air Force Base*, Hazardous Waste Bureau, New Mexico Environment Department, Santa Fe, New Mexico, February 24.

Shaw Environmental & Infrastructure, Inc. (Shaw), 2012, *Quality Program Plan, Midwestern Region Performance Based Remediation,* Contract No. FA8903-09-D-8580, Task Order No. 0013, Modification 01, Project No. 144106, Revision 0, January.

United States Army Corp of Engineers (USACE), 2010, *Basewide Septic Tank Solid Waste Management Units, RCRA Facility Investigation Work Plan, Holloman AFB, New Mexico*, Final.

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Final

RCRA Facility Investigation Report
Group 1 – Building 308 (OT-C530)
Holloman Air Force Base, New Mexico

Prepared for U.S. Air Force Civil Engineer Center
2261 Hughes Ave., Suite 155
Lackland Air Force Base, Texas 78236-9861

Prepared by Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

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Acronyms and Abbreviations

AFB	Air Force Base
bgs	below ground surface
COPC	constituent of potential concern
DPT	direct push technology
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
ft	foot/feet
GPR	ground-penetrating radar
GRO	gasoline range organics
HI	hazard index
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MCL	maximum contaminant level
MDL	method detection limit
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
ORO	oil range organics
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RSL	Regional Screening Level
Shaw	Shaw Environmental & Infrastructure, Inc. (a CB&I Company)
SSL	soil screening level
SVOC	semivolatile organic compound
TAL	target analyte list
TDS	total dissolved solids
TPH	total petroleum hydrocarbons
USACE	U.S. Army Corps of Engineers
VCM	Voluntary Corrective Measure
VOC	volatile organic compound
WQS	water quality standards

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1.0 INTRODUCTION

Shaw Environmental & Infrastructure. Inc. (Shaw), a CB&I company, prepared this Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for the Air Force Civil Engineer Center (formerly the Air Force Center for Engineering and the Environment) under Contract No. FA8903-09-D-8580, Task Order No. 0013, Modification 01. Results presented in this report are from the investigation and corrective measures of an inactive concrete vault (found to be unrelated to a septic system) located in the vicinity of Building 308 (OT-C530) at Holloman Air Force Base (AFB), New Mexico, which was one of the fifteen Group 1 sites under the Midwestern Region Performance-Based Remediation Contract. Although this structure was not related to a septic system, references to the Group 1 septic system site name and general investigation processes is retained in this report for simplicity and clarity. This RFI Report has been prepared pursuant to the requirements of the Holloman AFB Hazardous Waste Facility RCRA Permit No. NM6572124422 (the Permit) (New Mexico Environment Department [NMED], 2004). The purpose of this RFI was to delineate potential contamination that may have been released to the environment from the Building 308 vault. A Voluntary Corrective Measure (VCM) was performed concurrently with the RFI to remediate and close the inactive vault.

Holloman AFB is situated in south-central New Mexico in the northwest central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). The 15 Group 1 former septic tank sites are located throughout Holloman AFB (Figure 1-2). Each former septic tank is positioned adjacent to a building; as such, each septic tank is also named in reference to its most proximal building as follows: OT-C530 (Building 308), OT-C531 (Buildings 920, 921, and 922), OT-C532 (Building 924), OT-C533 (Building 1190), OT-C534 (Building 1194), OT-C535 (Building 1196), OT-C536 (Building 1199), OT-C537 (Building 1200), OT-C538 (Building 1201), OT-C539 (Building 1221), OT-C540 (Building 1251), OT-C541 (Building 1269), OT-C542 (Building 1166), OT-C543 (Building 1175), and OT-C544 (Building 1176). This report presents a summary of the RFI work conducted at the concrete vault (OT-C530) at Building 308.

Building 308 is a 3,200 square foot (ft) building that was constructed in 1965, and is currently used to store aircraft support equipment. Review of the historical records of this site included the *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) in Appendix A and the Technical Memorandum (Northwind, 2008, Appendix A). These documents indicated that no septic tank was utilized for Building 308, or the other buildings in the immediate vicinity. The records also note that there were no floor drains in the Building 308 facility, and that the janitor's sink and sanitary sewer pipe from the restroom

connects with the pipe from the restrooms in Building 309 (as shown on Figure 2 (Drawing 1-23) of the *Holloman AFB Septic Tanks* [U.S. Air Force, 2007] report in Appendix A). The sanitary sewer pipe then continues south to Manhole 334E. No cross connections to the storm sewer were identified. The Technical Memorandum (Northwind, 2008, Appendix A) also notes the presence of a working oil/water separator adjacent to Building 309, although unrelated to Building 308. During the investigation of Building 308, an anomalous, small concrete vault of unknown function (possibly a small grit trap) was located and subsequently abandoned at the direction of Holloman AFB. Investigations and abandonment of this structure proceeded as if it were a septic tank, and in accordance with the *Basewide Septic Tank Solid Waste Management Units RFI Work Plan* (U.S. Army Corps of Engineers [USACE], 2010).

1.1 Purpose of the Investigation

Investigative activities were undertaken at Holloman AFB to determine the nature and extent of contamination, and propose recommendations for either closure or additional corrective action, if necessary, at 15 inactive, abandoned, or removed septic tank systems, including one concrete vault, following the general guidance for closing septic systems found in 20.7.3.307 New Mexico Administrative Code (NMAC) Standards – Abandoned Sewers and On-Site Liquid Waste Systems. A Voluntary Corrective Measure (VCM) was performed concurrently with the RFI to remediate and close the inactive vault.

Project quality objectives for each septic tank site consisted of the following:

- Gather and review all site historical information
- Identify septic tank components and historical uses
- Remove septic tank contents and contaminated soil (where necessary), and abandon the tank (where necessary)
- Determine the nature and extent of residual constituents of concern at each site, including potential pathways to groundwater
- Evaluate the risk at each site
- Develop conclusions and recommendations for each site.

This RFI Report presents the data collected to meet these project quality objectives at the Building 308 concrete vault.

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1.2 Scope of Activities

This RFI Report describes all activities associated with the investigation and remediation performed under the VCM at Building 308. The activities include soil and groundwater sampling and analysis, risk evaluation, sludge characterization, septic tank abandonment, site restoration, and land surveying. The RFI work was performed in accordance with the Holloman AFB *Basewide Septic Tank Solid Waste Management Unit RFI Work Plan* (USACE, 2010) and the *Quality Program Plan* (Shaw, 2012a). The *Quality Program Plan* (Shaw, 2012a) contains the Site Safety and Health Plan; the Uniform Federal Policy – Sampling and Analysis Plan/Quality Assurance Project Plan; and the Construction Quality Plan, which defines the methodology and practices that were used to control construction work during the performance of the RFI. The abandonment work was conducted in accordance with the Group 1 *Final Voluntary Corrective Measures Request – Septic Tank Sites* (Shaw, 2012b) work plan, as well as the aforementioned project control documents.

1.3 Regulatory Setting

The Permit establishes the general and specific standards and activities for managing hazardous waste pursuant to Subtitle C of RCRA, the New Mexico Hazardous Waste Act, and the New Mexico Hazardous Waste Management Regulations. The Permit also sets forth requirements for investigation, notification, corrective action, and reporting for the storage, management, and releases of hazardous wastes.

The 15 septic systems, including one vault, were either inactive or previously removed, as indicated in *Holloman AFB Septic Tanks* (U.S. Air Force, 2007) (Appendix A) report, and were not listed in the Permit (NMED, 2004). The Holloman AFB *RFI Work Plan* (USACE, 2010) was approved by NMED in a letter dated January 13, 2010 (NMED, 2010). The NMED-approved *RFI Work Plan* (USACE, 2010) contained investigation activities only; therefore, Shaw submitted a *VCM Request* (Shaw, 2012b) to include remediation and closure tasks that addressed septic system abandonment using 20.7.3.307 NMAC (Abandoned Sewers and On-Site Liquid Waste Systems). NMED has primary regulatory responsibility for the septic system sites; therefore, corrective action must be performed under Title 20 NMAC.

The investigations were based on action/cleanup levels stipulated in Appendix 4-F of the Permit to be protective of human health and the environment. Permit Appendix 4-F specifies that soil contaminant concentrations be compared with the NMED residential soil screening levels (SSL), as presented in the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a), or the *U.S. Environmental Protection Agency (EPA) Regions 3, 6, and 9 Regional Screening Levels for Chemical Contaminants at Superfund Sites* (EPA, 2012a), if no NMED SSL has been established. Holloman AFB also has NMED-approved background concentrations for metals in soil (NMED, 2012b).

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For groundwater, the Permit specifies that the more stringent of either the New Mexico Water Quality Control Commission (NMWQCC) water quality standards (WQS) (20.6.2 NMAC), or the EPA maximum contaminant levels (MCL) for drinking water, be used for comparison with measured sample concentrations (EPA, 2012b).

1.4 RFI Report Organization

This RFI Report is organized into the following sections:

- **Section 1.0, Introduction**: Identifies the objectives and purpose of this report.
- **Section 2.0, Environmental Setting**: Provides pertinent descriptions of history, location, physiography, topography, surface water, hydrology, regional geology, soil types, regional hydrogeology, climate, current and future land use, and current and future water use for Holloman AFB.
- **Section 3.0, Source Characterization**: Presents the data collection techniques and locations, as well as analytical methods.
- **Section 4.0, Investigation Results and Evaluation**: Details the soil analytical results, and evaluates the human health risk due to site contaminants.
- **Section 5.0, Data Quality Assurance and Data Quality Control Review**: Summarizes the analytical data validation results.
- **Section 6.0, Conclusions and Recommendations**: Presents the conclusions and recommendations of this RFI report.
- **Section 7.0, References**: Lists the references cited in this report.

In addition to the figures and tables listed in the table of contents, the following appendices are included in this report:

- **Appendix A** – Historical Records
- **Appendix B** – Photographic Log
- **Appendix C** – Geophysical Report
- **Appendix D** – Sample Collection Logs
- **Appendix E** – Boring Logs
- **Appendix F** – Well Construction Diagrams
- **Appendix G** – Well Purge Records
- **Appendix H** – Site Survey Data

- **Appendix I** – Laboratory Analytical Data and Data Validation Checklists
- **Appendix J** – Waste Manifests
- **Appendix K** – Risk Evaluation Calculations.

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2.0 ENVIRONMENTAL SETTING

This section provides background information for Holloman AFB including physical setting, history, topography, climate, soils, geology, hydrology, and land and water use.

2.1 Physical Setting

Holloman AFB is situated in south-central New Mexico, in the northwest-central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). Holloman AFB has a population of 6,000, and occupies 59,639 acres in the northeast quarter of Section 1, Township 17 South, Range 8 East. The White Sands Missile Range testing facilities occupy additional land extending northward from the base. Privately- and publicly-owned lands border the remainder of Holloman AFB. The major highway servicing Holloman AFB is Highway 70, which runs southwest from the town of Alamogordo, New Mexico, and separates Holloman AFB from publicly-owned lands to the south. Alamogordo, New Mexico, which has a population of 30,401 according to the 2010 U.S. Census, is located approximately 7 miles east of the base.

2.2 Holloman Air Force Base History

Holloman AFB was first established in 1942 as Alamogordo Army Air Field. From 1942 through 1945, Alamogordo Army Air Field served as the training grounds for over 20 different flight groups, flying primarily B-17s, B-24s, and B-29s. After World War II, most operations had ceased at the base. In 1947, Air Material Command announced the air field would be its primary site for the testing and development of unmanned aircraft, guided missiles, and other research programs. On January 13, 1948, the Alamogordo installation was renamed in honor of the late Colonel George V. Holloman, a pioneer in guided missile research. In 1968, the 49th Tactical Fighter Wing arrived at Holloman AFB, and has remained since. Today, Holloman AFB also serves as the training center for the German Air Force's Tactical Training Center.

2.3 Physiography and Topography

Holloman AFB is located within the Sacramento Mountains physiographic province on the western edge of the Sacramento Mountains. The base is approximately 59,600 acres in area, and is located at a mean elevation of 4,093 ft above mean sea level. The region is characterized by high tablelands with rolling summit plains; cuesta-formed mountains dipping eastward; and west-facing escarpments, with the wide bracketed basin forming the basin and range complex. Holloman AFB is located in the Tularosa Basin, which is part of the Central Closed Basins. The bordering mountains rise abruptly to altitudes of 7,000 to 12,000 ft above mean sea level. The San Andres Mountains bound the basin to the west

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(approximately 30 miles) with the Sacramento Mountains approximately 10 miles to the east (Figure 2-1). At its widest, the basin is approximately 60 miles east to west, and stretches approximately 150 miles north to south.

2.4 Climate

As a whole, New Mexico has a mild, arid to semiarid continental climate characterized by light precipitation totals, abundant sunshine, relatively low humidity, and relatively large annual and diurnal temperature ranges (Western Regional Climate Center, 2013). The climate of the Central Closed Basins varies with elevation. The base is located in the low areas, and is characterized by warm temperatures and dry air. Daytime temperatures often exceed 100 degrees Fahrenheit in the summer months, and are in the middle 50s (degrees Fahrenheit) in the winter. A preponderance of clear skies and relatively low humidity permits rapid nighttime cooling, resulting in average diurnal temperature ranges of 25 to 35 degrees Fahrenheit. Potential evapotranspiration, at 67 inches per year, significantly exceeds annual precipitation, usually less than 15 inches. Arid conditions resulting from very low rainfall amounts, coupled with the topographically induced wind patterns combining with the sparse vegetation, tend to cause localized “dust devils.” The annual rainfall for Alamogordo, New Mexico is 12 inches per year. Much of the precipitation falls during the midsummer monsoonal period (July and August) as brief, yet frequent, intense thunderstorms culminating in 30 to 40 percent of the total annual rainfall.

2.5 Regional Geology and Soils

2.5.1 Geology

The sedimentary rocks that make up the adjacent mountain ranges are between 250 and 500 million years old (New Mexico Bureau of Geology and Mineral Resources, 2012). During the period when the area was submerged beneath the shallow intracontinental sea, the layers of limestone, shale, gypsum, and sandstone were formed. In time, these layers were pushed upward through various tectonic forces forming a large bulge on the surface. Approximately 10 million years ago, the center began to subside resulting in a vertical drop of thousands of ft, leaving the edges still standing (the present-day Sacramento and San Andres mountain ranges). In the millions of years following, rainfall, snowmelt, and wind eroded the mountain sediments depositing them in the valley (i.e., Tularosa Basin). Water carrying eroded limestone, dolomite, gravel, and other materials continue to flow into the basin.

As the Tularosa Basin is a bolson, which is a basin with no surface drainage outlet, sediments carried by surface water into a closed basin are bolson deposits. The overlying alluvium generally consists of unconsolidated gravels, sands, and clays. Soils in the basin are derived from the adjacent ranges as erosional deposits of limestone, dolomite, and gypsum. A fining

sequence from the ranges towards the basin's center characterizes the area with the near-surface soils as alluvial, eolian, and lacustrine deposits. The alluvial fan deposits are laterally discontinuous units of interbedded sand, silt, and clay, while the eolian deposits consist primarily of gypsum sands. The eolian and alluvial deposits are usually indistinguishable due to the reworking of the alluvial sediment by eolian processes. The playa, or lacustrine deposits, consist of clay containing gypsum, and are contiguous with the alluvial fan and eolian deposits throughout the base. Stiff caliche layers, varying in thickness, have been identified at different areas of the base.

2.5.2 Soils

The U.S. Natural Resources Conservation Service (formerly the Soil Conservation Service) has identified two soil associations in the vicinity of Holloman AFB: (1) the Holloman-Gypsum Land-Yesum Complex, and (2) the Mead silty clay loam (Figure 2-2) (U.S. Department of Agriculture, 1981). The permeability of these horizons ranges from 4×10^{-4} to 1×10^{-3} centimeters per second.

The Holloman-Gypsum Land-Yesum Complex, 0 to 5 percent sloped soil, consists of larger areas of shallow and deep, well-drained soils and areas of exposed gypsum. The Holloman soil makes up approximately 35 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 13 inches of the substratum is pink, very fine sandy loam that is very high in gypsum. Below that, the substratum is white gypsum to a depth of more than 60 inches. This soil is calcareous and mildly alkaline to moderately alkaline. Permeability is moderate. Available water capacity is very low.

Gypsum Land makes up approximately 30 percent of the Holloman-Gypsum Land-Yesum Complex (0 to 5 percent slopes). Typically, less than 1 inch of very fine sandy loam overlies soft to hard, white gypsum. The deep Yesum consists of very fine sandy loam that makes up approximately 20 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 9 inches of the substratum is light brown, fine sandy loam that is very high in gypsum. Below that, the substratum is pink, very fine sandy loam to a depth of more than 60 inches. The soil is calcareous throughout, and is mildly alkaline. Permeability is moderate. Available water capacity is moderate. Many fine gypsum crystals are found throughout the profile.

The soil type found across the main drainage area for the installation is Mead silty clay loam, 0 to 1 percent slopes. This deep, poorly drained, nearly level soil is on outer fringes of alluvial fans. This soil formed in fine textured alluvium over lacustrine lake sediment. It is very high in salt content because of periodic flooding and poor drainage. Slopes are smooth and concave. Typically, the surface layer is reddish brown, silty clay loam, and clay loam

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approximately 5 inches thick. The substratum, to a depth of 48 inches, is light reddish brown clay with a high content of salt. Below that, the substratum is lacustrine material of variable texture and color to a depth of more than 60 inches. Included within this soil are areas of Holloman soils and Gypsum Land along the margins of the unit of steep, short gully sides and knolls. These inclusions make up approximately 15 percent of the map unit for this soil type. Individual areas are generally smaller than 10 acres. This soil is moderately calcareous throughout, and is moderately to strongly alkaline. It has a layer of salt that is more soluble than gypsum. Permeability is very low. Available water capacity is low.

2.6 Regional Hydrogeology

Groundwater occurs as an unconfined aquifer in the unconsolidated deposits of the central basin, with the primary source of recharge as rainfall percolation and minor amounts of stream runoff along the western edge of the Sacramento Mountains. Surface water/rainfall migrates downward into the alluvial sediments at the edge of the shallow aquifer near the ranges, and flows through progressively finer-grained sediments towards the central basin. Because the Tularosa Basin is a closed system, water that enters the area leaves either through evaporation or percolation. This elevated amount of percolation results in a fairly high water table. Beneath Holloman AFB, groundwater ranges from 5 to 50 ft below ground surface (bgs). Flow for the base is generally towards the southwest with localized influences from the variations in the topography of the base (Figure 2-3). In the northern and western portions of the base, groundwater flows more to the west towards the Ritas Draw, Malone Draw, and Lost River drainages. Groundwater flow is affected by local topography in areas immediately adjacent to arroyos, where groundwater flows directly toward the drainages regardless of the regional flow pattern.

Groundwater in the Tularosa Basin is of potable quality at the recharge areas in close proximity to the Sacramento Mountains and becomes increasingly mineralized toward the central portion of the basin and discharge areas. The majority (over 70 percent) of the Environmental Restoration Program sites located across Holloman AFB have groundwater monitoring wells containing water with an average total dissolved solids (TDS) concentration greater than 10,000 milligrams per liter (mg/L). These TDS data support the hypothesis that TDS concentrations below 10,000 mg/L at Holloman AFB are caused by dilution of natural groundwater quality from leaking water lines and surface irrigation from the domestic water supply. TDS concentrations greater than 10,000 mg/L exceed the NMWQCC limit as potable water (20.6.2 NMAC), and thus, the groundwater beneath Holloman AFB has been designated as unfit for human consumption. Likewise, the EPA guidelines have identified the groundwater as a Class IIIB water source, characterized by TDS concentrations exceeding 10,000 mg/L, and is characterized by a low degree of interconnection with adjacent surface water or groundwater of a higher class. Groundwater

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does not discharge or connect to any adjacent aquifers, because the Tularosa Basin is a closed basin. Adjacent surface waters include Lost River and Lake Holloman, which also have high concentrations of TDS, and are not considered potential drinking water sources.

2.7 Surface Water and Hydrology

The Tularosa Basin contains all of the surface flow in its boundaries. The nearest inflow of surface waters to Holloman AFB comes from the Lost River, located in the north-central region of the base. The upper reaches of the Three Rivers and the Sacramento River are perennial in the basin. Holloman AFB is dissected by several southwest-trending arroyos that control the surface drainage. Hay Draw arroyo is located in the far north. Malone and Ritas Draws, which drain into the Lost River and Dillard Draw arroyos, are located along the eastern perimeter of the base. Approximately 10,000 years ago, indications are that a much wetter climate existed. The present-day Lake Otero encompassed a much larger area, possibly upwards of several hundred square miles. Its remains are the Alkali Flat and Lake Lucero. Lake Lucero is a temporary feature of merely a few inches in depth during the rainy season.

Ancient lakes and streams deposited water-bearing deposits over the older bedrock basement materials. Fractures, cracks, and fissures in the Permian and Pennsylvanian bedrock yield small quantities of relatively good-quality water in the deeper peripheral. Potable water is only found from wells near the edges of the basin, with more saline water towards the center. Two of the principal sources of potable water are: (1) a long narrow area on the upslope sides of Tularosa and Alamogordo, and (2) in the far southwestern part of the basin. A portion of the city of Alamogordo's water, as well as Holloman AFB's water, is supplied from Bonito Lake (which is in the Pecos River Basin).

2.8 Current and Future Land Use

The land surrounding Holloman AFB consists of residential areas to the east and northeast (city of Alamogordo, New Mexico), rangeland to the south, the White Sands National Monument to the west, and areas where military activities are conducted to the north. The desert terrain of the area immediately surrounding Holloman AFB has limited development, and there are no agricultural operations, residential communities, or large industrial operations located adjacent to the base. The Boles Well Field, a freshwater source for Holloman AFB, is located approximately 6 miles to the southeast of the base. Holloman AFB is an active military installation, and is expected to remain active for the foreseeable future. No transfer of military property to the public is anticipated, and public access to the base is restricted. Future land use is not expected to differ significantly from current land use practices (Foster Wheeler Environmental Corporation, 2002).

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2.9 Current and Future Water Use

At present, Holloman AFB receives approximately 50 percent of its freshwater supply from the Boles Well Field. An additional freshwater resource for Holloman AFB, and for the city of Alamogordo, is Bonito Lake, located 60 miles northeast of the Tularosa Basin. Currently, there are no potable supplies of groundwater or surface water located on the base because of poor groundwater quality with TDS concentrations greater than 10,000 mg/L.

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3.0 SOURCE CHARACTERIZATION

This section presents the overall technical approach in general accordance with the *Basewide Septic Tank Solid Waste Management Units, RFI Work Plan, Holloman AFB, New Mexico* (USACE, 2010) (except where otherwise noted), and details the investigative and remediation activities that were implemented at Building 308.

The primary environmental media of concern at Building 308 are soil and groundwater. The extent of contamination in soil was expected to be relatively local to the vault location. Therefore, the basic approach was to work outward from the location in identifying contaminated soil. To evaluate the potential impacts to groundwater, a monitoring well was planned for installation in the leach field; however, because one was not identified at OT-C530, the monitoring well was installed in the immediate vicinity of the vault. The analytical programs for both soil and groundwater focused on the expected nature of contamination likely to be associated with septic tank discharges.

During the investigation of Building 308, an anomalous, small concrete vault of unknown function (possibly a small grit trap) was located and subsequently abandoned at the direction of Holloman AFB. Investigations and abandonment of this structure proceeded as if it were a septic tank, and in accordance with the *RFI Work Plan* (USACE, 2010). The RFI, conducted at OT-C530 (Building 308), was initiated as part of the Midwestern Region Performance-Based Remediation Contract. Under the *RFI Work Plan* (USACE, 2010) for this site, field activities included: pre-mobilization and mobilization/site setup activities, soil boring advancement, soil sample collection, monitoring well installation, vault contents sampling, vault contents removal, vault bottom puncturing, concrete vault collapsing, backfilling, and surface restoration. Appendix B provides a photographic log of the Building 308 investigation and abandonment activities.

3.1 Pre-mobilization/Mobilization Activities

Several pre-investigation documents were filed, and approvals obtained, as follows:

- Civil Engineer Work Request (Air Force Form 332) approval
- Base digging permit (Air Force Form 103, Base Civil Engineering Work Clearance Request) with utility clearances
- Site security clearances
- Facility manager notification of the intended operations.

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Before the start of site work activities, a pre-investigation kick-off meeting and site walk-through were conducted with the Air Force Civil Engineer Center resident engineer, Holloman AFB personnel, and Shaw's Construction Manager, to plan for equipment access, equipment staging, decontamination area layout, potential site hazards, emergency evacuation routes, and project schedule.

Prior to the submittal of the base digging permits, the drilling locations were delineated using marker flags, stakes, and paint. Utility clearance approvals were completed by the appropriate Holloman AFB utility office (i.e., telephone, sewer, water, natural gas, etc.), and by the New Mexico One Call utility clearance system. Upon receipt of the approved digging permit and utility clearances, Shaw's Construction Manager completed a site walk-through to confirm the utility and intrusive work locations. In addition, Shaw performed a site survey prior to the start of drilling activities to search for signs of other buried or overhead utilities.

3.2 Geophysical Investigation

A geophysical investigation was performed at Building 308 in an attempt to define the limits of the inactive septic system. Methods employed included: visual inspection, electromagnetic induction conductivity detection, ground-penetrating radar (GPR), and electromagnetic pipe and cable location.

Electromagnetic induction conductivity detection ground induction methods are employed to detect broad metal mass anomalies or conductive zones that may be indicative of potential septic tanks, and lateral changes in conductive zones of soil or backfill materials relative to native soil. GPR is used to detect inactive septic tank excavation sidewalls and fill areas. An electromagnetic pipe and cable survey was conducted to detect buried utility lines.

Electromagnetic and GPR surveys were conducted at Building 308 in June 2012. The location of an anomalous concrete vault was identified, approximately 100 ft northeast of Building 308. No leach field drain line piping was observed during the survey. Underground utility lines were also delineated for later reference during soil boring activities. Geophysical findings are shown on Figure 3-1. The complete geophysical report is included in Appendix C.

3.3 Soil Investigation

The soil investigation of the vault at Building 308 was conducted on July 17, 2012 and August 29, 2012. The program consisted of sampling two borings advanced at the vault location, as shown on Figure 3-1. Soil boring Station 1 (sample numbers OTC530-IS-0001-071712, OTC530-IS-0002-071712FD, and OTC530-IS-0003-071712) was placed southeast of the vault; Station 2 (sample numbers OTC530-IS-0004-071712 and OTC530-IS-0005-071712) was placed southwest of the vault. All borings were advanced using direct push

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technology (DPT), with soil samples collected at depths of 3 to 5 ft and 10 to 12 ft at Station 1, and 7 to 9 ft and 14 to 16 ft at Station 2. Appendix D contains copies of the sample collection logs. A field duplicate was collected from the 3 to 5 ft depth at Station 1. DPT soil samples were also collected at the Monitoring Well OTC530-MW01 location from depths of 0 to 2 ft, 3 to 5 ft, and 10 to 12 ft (sample numbers OTC530-IS-0006-0082912, OTC530-IS-0007-082912, and OTC530-IS-0008-082912, respectively).

Soil samples were logged in the field in accordance with the Unified Soil Classification System requirements, and sample depths were in general accordance with the *RFI Work Plan* (USACE, 2010). Soil samples were not screened with a photoionization detector, since there was no sensory evidence of contamination. Appendix E has copies of the soil boring logs.

Soil samples for volatile organic compound (VOC) analysis were collected in accordance with EPA Method 5035, using a TerraCore® Sampler device (EPA, 1986), while non-VOC sample aliquots were placed in laboratory-provided containers. Samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), explosives, polychlorinated biphenyls (PCB), target analyte list (TAL) metals, total petroleum hydrocarbons (TPH)-gasoline range organics (GRO), TPH-diesel range organics (DRO), TPH-oil range organics (ORO), cyanide, percent solids, and tritium by Accutest Laboratories, Inc., a National Environmental Laboratory Accreditation Program-accredited laboratory, using EPA analytical methods, as summarized on Table 3-1.

The excess sample core soil extracted using the DPT drilling method was placed in 55-gallon drums for later characterization and transport to a licensed disposal facility. The boreholes were abandoned upon completion by plugging from the bottom of the borehole to ground surface using bentonite pellets, then patched with cement to match the surrounding land surface contour. The soil borings were then covered with gravel to match the surrounding land surface contour. Soil boring equipment was decontaminated between borings, as detailed in Holloman AFB Standard Operating Procedure 2, "Sampling Equipment Decontamination" (provided in Appendix B of the *RFI Work Plan* [USACE, 2010]) and Shaw's Standard Operating Procedure No. EI-FS-014, "Decontamination of Contact Sampling Equipment."

3.4 Groundwater Investigation

One monitoring well was installed at Building 308 to determine any impacts to groundwater. Well OTC530-MW01 was installed approximately 5 ft south of the concrete vault, as shown on Figure 3-1.

The monitoring well was installed using hollow-stem auger drilling techniques in accordance with NMED Ground Water Quality Bureau *Monitoring Well Construction and Abandonment*

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Guidelines (NMED, 2011). The 10-inch borehole was advanced approximately 4 ft into the water table at approximately 5 ft bgs, and completed such that the top of the well screen was set above the approximate level of the groundwater observed during drilling. The monitoring well was constructed of 2-inch-diameter Schedule-40 polyvinyl chloride riser with 2-inch diameter, Schedule-40 polyvinyl chloride screen fitted with prepacked, very fine stainless-steel meshing (Appendix F). The screened section of the well was 5 ft long (as opposed to the stipulated 10 ft in the *VCM Work Plan* [Shaw, 2012b]; the variance is based on observed lithology). A silica sand filter pack was placed around the screen to approximately 1.5 ft above the top of the screen, with a 1.5-ft thick bentonite seal placed above the filter pack. The remaining annular space was grouted with cement and bentonite.

The monitoring well was constructed in the asphalt as a "flush-mount" surface completion with a water-tight well vault, locking, expandable well plug, and finished to surrounding grade. Table 3-2 and Appendix F provide monitoring well construction details.

The newly-installed monitoring well was developed to create an effective filter pack around the well screen, remove fine particles from the formation near the borehole, and assist in restoring the natural water quality of the aquifer in the vicinity of the well. Development occurred five days after installation to allow for grout curing. Surging and pumping were both employed to achieve the most effective well development.

Information recorded during well development included water-level measurements, depth-to-bottom measurements, water-quality parameters (pH, temperature, specific conductance, turbidity, dissolved oxygen, oxidation-reduction potential, and TDS), discharge-water color, water volume, and time period. Development performed at monitoring well OTC530-MW01 resulted in the following conditions:

- Water removed from the well was slightly cloudy, and the turbidity was greatly reduced during well development (i.e., down to below 65 nephelometric turbidity units).
- The pH, temperature, and specific conductance parameters were stabilized (less than 10 percent variation for three successive readings).

Groundwater sampling was conducted at OTC530-MW01 on October 3, 2012 using low-flow sampling techniques. Water quality indicator parameters were measured and recorded during purging of the monitoring wells (Appendix G) using a field-calibrated water quality meter. Table 3-3 contains final water quality readings from the sampling event. Groundwater samples were collected once indicator parameters had stabilized, and analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium by Accutest Laboratories, Inc.

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3.5 Debris Removal and Vault Abandonment

The vault consisted of a 6- by 6- by 3-ft open concrete box, installed just below ground surface, below which was a 5 ft by 5.6 ft diameter steel tank. On October 13, 2012, the steel cover plate was removed from the top of the concrete box, and all solid material was excavated from the tank. The tank was significantly rusted due to corrosion during years of inactivity. The bottom of the tank was punctured such that the tank would no longer hold water, and the open concrete box was broken into pieces and pushed into the tank. Clean soil was placed into the tank and pit, to a level that allowed for placement of approximately 6 inches of concrete. Steel reinforcement bar was placed in the hole, after which concrete was poured and finished to match the grade of the existing parking lot. The concrete was allowed to cure prior to use for parking. Appendix B has photographs of the inactive tank and vault abandonment.

Two soil confirmation samples were collected prior to pushing the concrete box into the tank. Sample OTC530-CS-0001-101812 was collected just north of the vault and directly above groundwater (6 to 6.25 ft bgs), while sample OTC530-CS-0002-101812 was collected just south of the vault and directly above groundwater (6 to 6.25 ft bgs). Both samples were analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium by Accutest Laboratories, Inc., using EPA analytical methods, as summarized on Table 3-1.

3.6 Investigation-Derived Waste

The investigation-derived wastes that were generated during the RFI were segregated into the following categories:

- Soil – drill cuttings soil and vault debris
- Water – decontamination and monitoring well purge liquids.

Upon generation, investigation-derived waste was sampled for characterization (results discussed in Section 4.3), and properly containerized and temporarily stored at the designated laydown yard, as specified by Holloman AFB. Wastes were contained in sealed, U.S. Department of Transportation–approved, steel 55-gallon drums (for soil cuttings and decontamination water), roll-off containers with liners and covers (for excavated waste soil), and a 1,400-gallon plastic tank (for waste water). The waste soil drums were emptied into 20 cubic yard roll-off containers, and the waste water was pumped into the bulk plastic tank prior to characterization sampling and analysis for disposal.

3.7 Site Surveying

The soil borings and monitoring well locations, along with the septic tank location and associated features as shown on Figure 3-1, were surveyed by Albuquerque Surveying Company, Inc. from Albuquerque, New Mexico, a state-licensed surveyor.

Horizontal coordinates are referenced to the North American Datum 1983 State Plane Coordinate System, New Mexico-Central, and surveyed to an accuracy of ±1.0 ft. Vertical elevations are referenced to the North American Vertical Datum 1988 coordinate system to an accuracy of ±0.01 ft. A copy of the survey results is presented in Appendix H.

3.8 Decontamination Procedures

A decontamination pad was constructed at the designated laydown area for decontamination of all downhole drilling equipment. The drilling rig was decontaminated prior to entering the site. Drilling equipment that came into contact with the borehole was decontaminated by hot-water pressure washing. Disposable equipment used for soil sample collection did not require decontamination.

4.0 INVESTIGATION RESULTS AND EVALUATION

Soil analytical results presented in this section were used to delineate constituents of concern that may have been released to the environment, and confirm that no additional remedial measures are required.

4.1 Soil Analytical Results

DPT soil boring samples and post-excavation confirmation samples were collected during the Building 308 RFI, at the locations shown on Figure 3-1. All soil samples were sent to Accutest Laboratories, Inc., for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium analyses. Analytical results for the soil samples are presented in Table 4-1. Laboratory analytical data packages, and the data validation checklists for the soil sample data, are provided in Appendix I.

The analytical results for metals in Table 4-1 show that Holloman AFB soil samples contain significant amounts of calcium, typically greater than 100,000 milligrams per kilogram (mg/kg) (10 percent), and can be as high as 250,000 mg/kg (25 percent). Calcium at these levels contributes spectral interferences during inductively-coupled plasma metals analysis, and can also clog the nebulizer that is used to introduce the sample. Sample dilution is the recommended method for solving both the spectral interference issue and the nebulizer clogging issue. However, sample dilution raises the analytical method detection limits (MDL) for all associated metals, including thallium.

A typical method detection limit for thallium during inductively-coupled plasma analysis is 0.13 mg/kg. Diluting by a factor of 5 to 20 to eliminate calcium spectral interference and nebulizer clogging causes the thallium detection limit to be elevated by a factor of 5 to 20. This results in a MDL that is above the NMED residential SSL of 0.782 mg/kg thallium. Consequently, the required remedy to allow for proper equipment operation resulted in MDLs that were above the NMED residential SSL. However, thallium is not an element that is anticipated to be present at Building 308 as a result of normal activities.

The validated soil analytical results were compared with the NMED SSLs (NMED, 2012a), or the EPA Regional Screening Levels (RSL) (EPA, 2012a), if NMED residential SSLs were not established for a given analyte. In addition, a TPH screening level of 1,000 mg/kg was used to evaluate the laboratory analytical data. The 1,000 mg/kg action level for petroleum-contaminated soil is the Residential Direct Exposure Limit for unknown oil, listed in Table 6-2 (TPH Screening Guidelines for Potable Groundwater) of the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a).

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Debris sample OTC530-SL-0001-071712 had a benzo(a)pyrene concentration of 0.187 mg/kg (above the NMED residential SSL of 0.148 mg/kg), and a lead concentration of 13.6 mg/kg (above the Holloman AFB background value of 10.9 mg/kg, but less than the NMED residential SSL of 400 mg/kg). Benzo(a)pyrene and lead were not detected at concentrations above the applicable NMED residential SSLs in confirmation soil samples (OTC530-CS-0001 and OTC530-CS-0002) collected beneath the vault. The debris was characterized as non-hazardous waste, removed from the tank, placed in containers, and transported to Otero/Greentree Regional Landfill in Alamogordo, New Mexico for disposal.

No other soil samples had detections above the NMED residential SSLs. Likewise, all soil samples from all locations and depths had TPH-GRO, TPH-DRO, and TPH-ORO concentrations below the TPH screening level. In addition, no tritium was detected in any of the soil samples.

Sample OTC530-IS-0008-081312, collected from OT-C530 Station 3/OTC530-MW01 in the 10 to 12 ft bgs interval, had a barium concentration (203 mg/kg) above the Holloman soil background value of 169.3 mg/kg. All other parameters were below the background values.

4.2 Groundwater Analytical Results

One monitoring well (OTC530-MW01) was installed during the investigation, as shown on Figure 3-1. Groundwater from well OTC530-MW01 was analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium by Accutest Laboratories, Inc. Detections were compared to the NMWQCC WQS and EPA drinking water MCLs. The Building 308 groundwater sample had a TDS value below 10,000 mg/L.

Analytical results for the Building 308 groundwater samples are shown in Table 4-2. All analytical parameter concentrations were below the NMWQCC WQS and the EPA MCLs. Barium and manganese groundwater concentrations exceeded the Holloman AFB unfiltered groundwater background values.

4.3 Investigation-Derived Waste Analytical Results

Waste characterization samples were collected from the bulk waste soil for analysis of Toxicity Characteristic Leaching Procedure VOCs, SVOCs, and RCRA metals. The results are presented in Table 4-3. The results of the waste soil analysis returned no concentrations above 40 Code of Federal Regulations Part 261.24 limits. The waste soil could be managed as nonhazardous waste, and was subsequently transported to Otero/Greentree Regional Landfill, Alamogordo, New Mexico for disposal (Waste Manifest in Appendix J).

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The wastewater from equipment decontamination was sampled and analyzed for VOCs, SVOCs, TAL metals, TPH-GRO, TPH-DRO, and TPH-ORO, with the analytical results presented in Table 4-4. The analytical results were reviewed by the Holloman AFB wastewater treatment plant personnel, and subsequently accepted for disposal.

4.4 Risk-Based Evaluation

4.4.1 Soil

Ten soil samples were collected at Building 308, from depths of 0 to 12 ft bgs, during the investigation. The material associated with debris sample OTC530-SL-0001-071712 was removed from the vault for off-site disposal, and therefore, was not considered during this risk evaluation. Per NMED (2012a), the soil depths of interest for a risk evaluation are 0 to 10 ft bgs for construction workers and residential receptors, and 0 to 1 ft bgs for commercial/industrial workers. Therefore, results from the screening assessment (Table 4-1) for the depth interval of 0 to 10 ft bgs were used for the risk evaluation. Based on the results of the initial screening evaluation, no constituents of potential concern (COPC) have a maximum detected concentration greater than: (1) NMED residential screening values (or EPA residential RSLs, if NMED values have not been established), and (2) site-specific background values. Total cancer risk ratios and total hazard ratios (hazard index [HI]) to address potential additive toxicological effects were also assessed (per NMED 2012a, Section 5.0). This was conducted by using maximum detected concentrations of carcinogens and non-carcinogens, estimating risk and hazard ratios, and scaling a total cancer risk and total hazard index. The total cancer risk was less than 1.0×10^{-5} (total cancer risk: 5.4×10^{-6}) and the total HI was less than 1.0 (site HI: 0.8), as shown in Appendix K.

Therefore, as no COPCs were selected for soil, and total cancer risks and non-cancer hazards were acceptable, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure are not health risks.

4.4.2 Groundwater

One groundwater sample was collected from the Building 308 monitoring well OTC530-MW01 on October 3, 2012. Based on the results of the screening evaluation (Table 4-2), no chemicals have concentrations greater than NMWQCC WQS or EPA drinking water MCLs. The barium and manganese concentrations in OTC530-MW01 groundwater exceeded the site-specific background value (unfiltered), but were below the NMWQCC water quality standard. Therefore, as no chemicals in groundwater were selected, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not health risks.

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4.4.3 Risk-Based Conclusions

No COPCs were selected in soil or groundwater; and total cancer risks and non-cancer hazards in soil were acceptable; therefore, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure are not health risks.

4.5 Ecological Evaluation

The site of the concrete vault at Building 308 is a flat-lying, asphalt surface which serves as the parking lot for the building (as shown in the photographic log in Appendix B). The surrounding areas serve as support functions for the flight line, and include aircraft maintenance and fueling facilities. Using the Ecological Site Exclusion Criteria Decision Tree (Attachment B to Volume 2 of *Risk Assessment Guidance for Investigations and Remediation* [NMED, 2012c]), no sensitive areas exist at or adjacent to the site, the site does not contain other land areas which could be considered viable ecological habitat, and/or the site does not contain any perennial or ephemeral aquatic features. Therefore, an ecological assessment is not warranted at this time.

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5.0 DATA QUALITY ASSURANCE AND DATA QUALITY CONTROL REVIEW

All analytical data was reviewed in accordance with EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA, 2004a) and the EPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (EPA, 2004b). Data qualifiers were added to the database prior to project use. The data tables provided in Section 4.0 show the data qualifiers added during data validation. Detailed data validation checklists for each data deliverable are provided in Appendix I.

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6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary and Conclusions

6.1.1 Soil

Ten soil samples were collected at Holloman AFB Building 308 during the investigation and analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium. Validated analytical results were compared with the NMED residential SSLs, the NMED Residential Direct Exposure Limit for soil contaminated with unknown petroleum oil, and the Holloman AFB soil background values. No parameters were detected that exceeded the New Mexico residential soil screening. Likewise, TPH was not detected above 1,000 mg/kg in any of the soil samples from any depth or location.

Risk-based health screening concluded that there were no COPCs in soil.

6.1.2 Groundwater

One groundwater sample was collected from the Building 308 monitoring well OTC530-MW01. The sample was analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium. No parameters had concentrations greater than the NMWQCC WQS or the EPA drinking water MCLs.

Risk-based health screening concluded that there were no COPCs in groundwater.

6.1.3 Vault Abandonment

The Building 308 concrete vault was abandoned in place in accordance with 20.7.3.307 NMAC. In doing so, its contents were sampled, removed, and disposed at Otero/Greentree Regional Landfill, a permitted waste facility, located in Alamogordo, New Mexico. The bottom of the vault was punctured to prevent the tank from holding water and the vault was demolished by collapsing the sidewalls.

As presented in Section 3.5, the two confirmatory soil samples collected from beneath the vault contained no constituents above NMED residential SSLs. Following soil sampling and vault abandonment in place, clean soil was used as backfill. Approximately 6 inches of reinforced concrete paving was installed to match the existing parking lot.

6.2 Recommendations

6.2.1 Soil

COPCs were not detected in the soil above NMED residential SSLs. Therefore, no additional corrective action is recommended for soil at Building 308.

6.2.2 Groundwater

COPCs were not detected in groundwater above the NMWQCC WQS or the EPA drinking water MCLs. Therefore, no additional corrective action is recommended for groundwater at Building 308.

6.2.3 Vault Abandonment

The concrete vault at Building 308 was abandoned in proper accordance with 20.7.3.307 NMAC. Therefore, this task is complete and no further work at this site is required.

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-066

7.0 REFERENCES

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Tables

Table 3-1
Sample Summary
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OTC530-CON1	672380.6843*	1692279.6219*	10/18/2012	Confirmation Soil	6 - 6.25	OTC530-CS-0001-101812	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OTC530-CON2	672376.3304*	1692283.4040*	10/18/2012	Confirmation Soil	6 - 6.25	OTC530-CS-0002-101812	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OTC530-SL1	672378.4242*	1692281.5418*	7/17/2012	Sludge	NA	OTC530-SL-0001-071712	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0

Table 3-1
Sample Summary
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OTC530-MW01 (Station 3)	672368.3690	1692281.6949	8/29/2012	Investigation Soil	0 - 2	OTC530-IS-0006-082912	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			8/29/2012	Investigation Soil	3 - 5	OTC530-IS-0007-082912	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			8/29/2012	Investigation Soil	10 - 12	OTC530-IS-0008-082912	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0

Table 3-1
Sample Summary
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OTC530-MW01 (Station 3)	672368.3690	1692281.6949	10/3/2012	Groundwater	NA	OTC530-GW-5301-100312	TDS	SM2540C
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OTC530-Station 1	672369.6116	1692275.9995	7/17/2012	Investigation Soil	3 - 5	OTC530-IS-0001-071712	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/17/2012	Investigation Soil - Field Duplicate	3 - 5	OTC530-IS-0002-071712-FD	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0

Table 3-1
Sample Summary
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OTC530-Station 1	672369.6116	1692275.9995	7/17/2012	Investigation Soil	10 - 12	OTC530-IS-0003-071712	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OTC530-Station 2	672372.2409	1692284.1222	7/17/2012	Investigation Soil	7 - 9	OTC530-IS-0004-071712	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-GRO	SW8015C
							TPH-DRO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/17/2012	Investigation Soil	14 - 16	OTC530-IS-0005-071712	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-GRO	SW8015C
							TPH-DRO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0

Table 3-1
Sample Summary
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

* Survey coordinates were estimated, as these sample locations were not surveyed in the field. The locations were estimated using field maps, notes, and photography, and then were pinpointed on field maps. These identified locations were then plotted in GIS to best approximate the locations. In some cases, surveyed locations were utilized to triangulate a non-surveyed location. Once plotted, coordinate locations were calculated using GIS. All coordinates were calculated using the New Mexico State Plane Central NAD 1983 Feet coordinate system.

[a] Coordinates are referenced to the North American Datum, 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] EPA, 1986, Test Methods for Evaluating Soil Waste Physical/Chemical Methods, EPA Publication SW-846, Final Update IV. Available online at www.epa.gov/osw/hazard/testmethods/sw846.

Percent Solids and Total Dissolved Solids from *Standard Methods for the Examination of Water and Wastewater* , 19th edition, 1995.

ft bgs = feet below ground surface
CON = confirmation sample
CS = confirmation soil
DRO = diesel range organics
EPA = Environmental Protection Agency
FD = field duplicate
GRO = gasoline range organics
GW = groundwater
IS = investigation soil
MW = monitoring well
NA = not applicable
ORO = oil range organics
PCB = polychlorinated biphenyl
RFI = RCRA Facility Investigation
RCRA = Resource Conservation and Recovery Act
SL = sludge
SVOC = semivolatile organic compound
TAL = target analyte list
TDS = total dissolved solids
TPH = total petroleum hydrocarbons
VOC = volatile organic compound

Table 3-2
Monitoring Well Construction Details and Groundwater Elevation Data
Building 308 (OT-C530)
Holloman Air Force Base, New Mexico

Well ID	Monitoring Well Construction Details						Groundwater Elevation Data: 10/3/2012		
	Location Coordinates		Installation Date	Well Diameter (in)	Well Depth at Construction (ft bgs)	Screened Interval (ft bgs)	Top of PVC Riser Pipe Elevation[b] (ft amsl)	Depth to Water (ft below top of PVC riser pipe)	Potentiometric Surface Elevation[b] (ft amsl)
	Grid Northing[a]	Grid Easting[a]							
OTC530-MW01	672368.369	1692281.6949	8/29/2012	2	9.0	4.0-9.0	4084.49	6.39	4078.10

[a] Location coordinates are in North American Datum 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] Elevations are referenced to the North American Vertical Datum of 1988 (NAVD 88).

ft = feet
ft amsl = feet above mean sea level
ft bgs = feet below ground surface
ID = identification
in = inches
PVC = polyvinyl chloride

Table 3-3
Monitoring Well Purge Water Quality Parameters
Building 308 (OT-C530)
Holloman Air Force Base, New Mexico

Well ID	Sample Date	Depth to Water (ft below top of PVC riser pipe)	Total Depth (ft below top of PVC riser pipe)	Purge Water Volume (gallons)	Temperature (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	TDS (g/L)
OTC530-MW01	10/3/2012	6.39	8.62	Not recorded	25.60	6.46	4.168	*	2.92	131.6	2.71

* Indicates that the turbidity meter was not functioning properly at the time of sample purging.

°C = degrees Celsius
DO = dissolved oxygen
ft = feet
g/L = grams per liter
ID = identification
mg/L = milligrams per liter
mS/cm = millisiemens per centimeter
mV = millivolts
NTU = Nephelometric Turbidity Unit
ORP = oxidation-reduction potential
PVC = polyvinyl chloride
TDS = total dissolved solids

Table 4-1
Soil Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC530-CS-0001-101812		OTC530-CS-0002-101812		OTC530-IS-0001-071712		OTC530-IS-0002-071712-FD		OTC530-IS-0003-071712		OTC530-IS-0004-071712	
				Sample Date		10/18/2012		10/18/2012		7/17/2012		7/17/2012		7/17/2012		7/17/2012	
				Location		CON1, under tank		CON2, under tank		Station 1, tank influent		Station 1, tank influent		Station 1, tank influent		Station 2, septic tank	
				Depth (ft bgs)		6 - 6.25		6 - 6.25		3 - 5		3 - 5		10 - 12		7 - 9	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE	**77.5**		**77.8**		**84.7**		**88.1**		**77.1**		**73.3**			
VOLATILES (mg/kg)																	
1,1,1-TRICHLOROETHANE	NE	8700	15600	0.00071	U	0.00081	U	0.001	U	0.00083	U	0.001	U	0.00097	U		
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02	0.00071	U	0.00081	U	0.0011	U	0.0009	U	0.0011	U	0.0011	U		
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100	0.001	U	0.0012	U	0.0015	U	0.0013	U	0.0016	U	0.0015	U		
1,1,2-TRICHLOROETHANE	NE	1.1	2.81	0.00071	U	0.00081	U	0.001	U	0.00083	U	0.001	U	0.00097	U		
1,1-DICHLOROETHANE	NE	3.3	64.5	0.00071	U	0.00081	U	0.001	U	0.00083	U	0.001	U	0.00097	U		
1,1-DICHLOROETHENE	NE	240	449	0.00086	U	0.00098	U	0.0013	U	0.0011	U	0.0013	U	0.0012	U		
1,2,4-TRICHLOROBENZENE	NE	22	73.0	0.00083	U	0.00095	U	0.0011	U	0.0009	U	0.0011	U	0.0011	U		
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86	0.0018	U	0.002	U	0.0021	U	0.0017	U	0.0021	U	0.002	U		
1,2-DIBROMOETHANE	NE	0.034	0.588	0.00071	U	0.00081	U	0.00091	U	0.00075	U	0.00091	U	0.00088	U		
1,2-DICHLOROBENZENE	NE	1900	2310	0.00077	U	0.00088	U	0.001	U	0.00083	U	0.001	U	0.00097	U		
1,2-DICHLOROETHANE	NE	0.43	7.89	0.00085	U	0.00097	U	0.00091	U	0.00075	U	0.00091	U	0.00088	U		
1,2-DICHLOROPROPANE	NE	0.94	15.2	0.00071	U	0.00081	U	0.0011	U	0.0009	U	0.0011	U	0.0011	U		
1,3-DICHLOROBENZENE	NE	NE	NE	0.00071	U	0.00081	U	0.0011	U	0.0009	U	0.0011	U	0.0011	U		
1,4-DICHLOROBENZENE	NE	2.4	31.7	0.00092	U	0.0011	U	0.001	U	0.00083	U	0.001	U	0.00097	U		
2-HEXANONE	NE	210	NE	0.0035	U	0.004	U	0.0049	U	0.0041	U	0.0049	U	0.0047	U		
ACETONE	NE	61000	66600	0.014	U	0.016	U	0.018	U	0.015	U	**0.0348**	J	0.018	U		
BENZENE	NE	1.1	15.4	0.00071	U	0.00081	U	0.0014	U	0.0011	U	0.0014	U	0.0013	U		
BROMODICHLOROMETHANE	NE	0.27	5.41	0.001	U	0.0011	U	0.001	U	0.00083	U	0.001	U	0.00097	U		
BROMOFORM	NE	62	616	0.00071	U	0.00081	U	0.0014	U	0.0011	U	0.0014	U	0.0013	U		
BROMOMETHANE	NE	7.3	16.5	0.0014	U	0.0016	U	0.0018	U	0.0015	U	0.0018	U	0.0018	U		
CARBON DISULFIDE	NE	820	1530	0.0014	U	0.0016	U	0.0018	U	0.0015	U	0.0018	U	0.0018	U		
CARBON TETRACHLORIDE	NE	0.61	10.8	0.0008	U	0.00092	U	0.0016	U	0.0014	U	0.0016	U	0.0016	U		
CHLOROBENZENE	NE	290	376	0.00071	U	0.00081	U	0.00091	U	0.00075	U	0.00091	U	0.00088	U		
CHLOROETHANE	NE	15000	29800	0.0014	U	0.0016	U	0.0018	U	0.0015	U	0.0018	U	0.0018	U		
CHLOROFORM	NE	0.29	5.86	0.00071	U	0.00081	U	0.0011	U	0.0009	U	0.0011	U	0.0011	U		
CHLOROMETHANE	NE	120	275	0.0015	U	0.0017	U	0.0018	U	0.0015	U	0.0018	U	0.0018	U		
CIS-1,2-DICHLOROETHYLENE	NE	160	156	0.00071	U	0.00081	U	0.0014	U	0.0011	U	0.0014	U	0.0013	U		
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	0.00071	U	0.00081	U	0.00091	U	0.00075	U	0.00091	U	0.00088	U		
CYCLOHEXANE	NE	7000	NE	0.00071	U	0.00081	U	0.0013	U	0.0011	U	0.0013	U	0.0012	U		
DIBROMOCHLOROMETHANE	NE	0.68	12.1	0.00071	U	0.00081	U	0.00091	U	0.00075	U	0.00091	U	0.00088	U		
DICHLORODIFLUOROMETHANE	NE	94	168	0.00071	U	0.00081	U	0.0014	U	0.0011	U	0.0014	U	0.0013	U		
ETHYLBENZENE	NE	5.4	68.4	0.00078	U	0.00089	U	0.00091	U	0.00075	U	0.00091	U	0.00088	U		
ISOPROPYLBENZENE	NE	2100	2430	0.00093	U	0.0011	U	0.001	U	0.00083	U	0.001	U	0.00097	U		
METHYL ACETATE	NE	78000	78200	0.0078	U	0.0089	U	0.011	U	0.0094	U	0.011	U	0.011	U		
METHYL ETHYL KETONE	NE	28000	37100	0.0035	U	0.004	U	0.0055	U	0.0046	U	**0.0058**	J	0.0054	U		
METHYL ISOBUTYL KETONE	NE	5300	5820	0.0035	U	0.004	U	0.005	U	0.0041	U	0.005	U	0.0048	U		
METHYLCYCLOHEXANE	NE	5630	5630	0.00071	U	0.00081	U	0.0012	U	0.00098	U	0.0012	U	0.0011	U		
METHYLENE CHLORIDE	NE	56	409	0.0032	U	0.0037	U	0.0042	U	0.0035	U	0.0042	U	0.004	U		

Table 4-1
Soil Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC530-CS-0001-101812		OTC530-CS-0002-101812		OTC530-IS-0001-071712		OTC530-IS-0002-071712-FD		OTC530-IS-0003-071712		OTC530-IS-0004-071712	
				Sample Date		10/18/2012		10/18/2012		7/17/2012		7/17/2012		7/17/2012		7/17/2012	
				Location		CON1, under tank		CON2, under tank		Station 1, tank influent		Station 1, tank influent		Station 1, tank influent		Station 2, septic tank	
				Depth (ft bgs)		6 - 6.25		6 - 6.25		3 - 5		3 - 5		10 - 12		7 - 9	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																	
STYRENE	NE	6300	7280	0.00071	U	0.00081	U	0.0024	U	0.002	U	0.0024	U	0.0023	U		
TERT-BUTYL METHYL ETHER	NE	43	901	0.00071	U	0.00081	U	0.0018	U	0.0015	U	0.0018	U	0.0018	U		
TETRACHLOROETHYLENE	NE	22	7.02	0.00081	U	0.00093	U	0.00091	U	0.00075	U	0.00091	U	0.00088	U		
TOLUENE	NE	5000	5270	0.00071	U	0.00081	J	0.0011	U	0.0009	U	0.0011	U	0.0011	U		
TRANS-1,2-DICHLOROETHENE	NE	150	270	0.00071	U	0.00081	U	0.0014	U	0.0011	U	0.0014	U	0.0013	U		
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.00071	U	0.00081	U	0.001	U	0.00083	U	0.001	U	0.00097	U		
TRICHLOROETHYLENE	NE	0.91	8.77	0.00071	U	0.00081	U	0.0011	U	0.0009	U	0.0011	U	0.0011	U		
TRICHLOROFLUOROMETHANE	NE	790	1410	0.0014	U	0.0016	U	0.0018	U	0.0015	U	0.0018	U	0.0018	U		
VINYL CHLORIDE	NE	0.06	0.728	0.00071	U	0.00081	U	0.0014	U	0.0011	U	0.0014	U	0.0013	U		
XYLENES, TOTAL	NE	630	814	0.0022	U	0.0025	U	0.0029	U	0.0024	U	0.0029	U	0.0028	U		
SEMIVOLATILES (mg/kg)																	
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	0.024	U	0.024	U	0.02	U	0.019	U	0.021	U	0.023	U		
2,4,5-TRICHLOROPHENOL	NE	6100	6110	0.025	U	0.025	U	0.02	U	0.019	U	0.021	U	0.023	U		
2,4,6-TRICHLOROPHENOL	NE	44	61.1	0.027	U	0.027	U	0.02	U	0.019	U	0.021	U	0.023	U		
2,4-DICHLOROPHENOL	NE	180	183	0.024	U	0.024	U	0.02	U	0.019	U	0.021	U	0.023	U		
2,4-DIMETHYLPHENOL	NE	1200	1220	0.031	U	0.031	U	0.025	U	0.023	U	0.027	U	0.028	U		
2,4-DINITROPHENOL	NE	120	122	0.21	U	0.21	U	0.39	U	0.37	U	0.43	U	0.45	U		
2,4-DINITROTOLUENE	NE	1.6	15.7	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U		
2,6-DINITROTOLUENE	NE	61	61.1	0.026	U	0.026	U	0.023	U	0.022	U	0.025	U	0.027	U		
2-CHLORONAPHTHALENE	NE	6300	6260	0.027	U	0.027	U	0.039	U	0.037	U	0.043	U	0.045	U		
2-CHLOROPHENOL	NE	390	391	0.025	U	0.025	U	0.02	U	0.019	U	0.021	U	0.023	U		
2-METHYLNAPHTHALENE	NE	230	NE	0.024	U	0.025	U	0.02	U	0.019	U	0.021	U	0.023	U		
2-METHYLPHENOL	NE	3100	NE	0.026	U	0.026	U	0.02	U	0.019	U	0.021	U	0.023	U		
2-NITROANILINE	NE	610	NE	0.031	U	0.031	U	0.039	U	0.037	U	0.043	U	0.045	U		
2-NITROPHENOL	NE	NE	NE	0.032	U	0.032	U	0.02	U	0.019	U	0.021	U	0.023	U		
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	0.035	U	0.035	U	0.039	U	0.037	U	0.043	U	0.045	U		
3-NITROANILINE	NE	NE	NE	0.03	U	0.03	U	0.039	U	0.037	U	0.043	U	0.045	U		
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	0.084	U	0.085	U	0.078	U	0.074	U	0.085	U	0.09	U		
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.027	U	0.027	U	0.02	U	0.019	U	0.021	U	0.023	U		
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	0.023	U	0.023	U	0.02	U	0.019	U	0.021	U	0.023	U		
4-CHLOROANILINE	NE	2.4	NE	0.032	U	0.032	U	0.02	U	0.019	U	0.021	U	0.023	U		
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U		
4-NITROANILINE	NE	24	NE	0.045	U	0.045	U	0.039	U	0.037	U	0.043	U	0.045	U		
4-NITROPHENOL	NE	NE	NE	0.17	U	0.17	U	0.16	U	0.15	U	0.17	U	0.18	U		
ACENAPHTHENE	NE	3400	3440	0.025	U	0.025	U	0.02	U	0.019	U	0.021	U	0.023	U		
ACENAPHTHYLENE	NE	NE	NE	0.024	U	0.024	U	0.02	U	0.019	U	0.021	U	0.023	U		
ACETOPHENONE	NE	7800	7820	0.025	U	0.025	U	0.02	U	0.019	U	0.021	U	0.023	U		
ANTHRACENE	NE	17000	17200	0.021	U	0.021	U	0.02	U	0.019	U	0.021	U	0.023	U		
ATRAZINE	NE	2.1	NE	0.021	U	0.021	U	0.02	U	0.019	U	0.021	U	0.023	U		

Table 4-1
Soil Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC530-CS-0001-101812		OTC530-CS-0002-101812		OTC530-IS-0001-071712		OTC530-IS-0002-071712-FD		OTC530-IS-0003-071712		OTC530-IS-0004-071712	
				Sample Date		10/18/2012		10/18/2012		7/17/2012		7/17/2012		7/17/2012		7/17/2012	
				Location		CON1, under tank		CON2, under tank		Station 1, tank influent		Station 1, tank influent		Station 1, tank influent		Station 2, septic tank	
				Depth (ft bgs)		6 - 6.25		6 - 6.25		3 - 5		3 - 5		10 - 12		7 - 9	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																	
BENZALDEHYDE	NE	7800	NE	0.21	U	0.21	U	0.2	U	0.19	U	0.21	U	0.23	U		
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.021	U	0.021	U	0.02	U	0.019	U	0.021	U	0.023	U		
BENZO(A)PYRENE	NE	0.015	0.148	0.021	U	0.021	U	0.02	U	0.019	U	0.021	U	0.023	U		
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.021	U	0.021	U	0.02	U	0.019	U	0.021	U	0.023	U		
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.021	U	0.021	U	0.02	U	0.019	U	0.021	U	0.023	U		
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.025	U	0.025	U	0.02	U	0.019	U	0.021	U	0.023	U		
BENZYL BUTYL PHTHALATE	NE	260	NE	0.042	U	0.042	U	0.039	U	0.037	U	0.043	U	0.045	U		
BIPHENYL	NE	51	57.1	0.028	U	0.028	U	0.02	U	0.019	U	0.021	U	0.023	U		
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.03	U	0.03	U	0.02	U	0.019	U	0.021	U	0.023	U		
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.029	U	0.029	U	0.02	U	0.019	U	0.021	U	0.023	U		
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.042	U	0.042	U	0.078	U	0.074	U	0.085	U	0.09	U		
CAPROLACTAM	NE	31000	NE	0.023	U	0.023	U	0.063	U	0.06	U	0.068	U	0.072	U		
CARBAZOLE	NE	NE	NE	0.023	U	0.023	U	0.02	U	0.019	U	0.021	U	0.023	U		
CHRYSENE	NE	15	148	0.021	U	0.021	U	0.02	U	0.019	U	0.021	U	0.023	U		
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.021	U	0.021	U	0.02	U	0.019	U	0.021	U	0.023	U		
DIBENZOFURAN	NE	78	NE	0.021	U	0.021	U	0.02	U	0.019	U	0.021	U	0.023	U		
DIETHYL PHTHALATE	NE	49000	48900	0.042	U	0.042	U	0.078	U	0.074	U	0.085	U	0.09	U		
DIMETHYL PHTHALATE	NE	611000	611000	0.042	U	0.042	U	0.039	U	0.037	U	0.043	U	0.045	U		
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.042	U	0.042	U	0.078	U	0.074	U	0.085	U	0.09	U		
DI-N-OCTYLPHTHALATE	NE	730	NE	0.042	U	0.042	U	0.039	U	0.037	U	0.043	U	0.045	U		
FLUORANTHENE	NE	2300	2290	0.021	U	0.021	U	0.02	U	0.019	U	0.021	U	0.023	U		
FLUORENE	NE	2300	2290	0.023	U	0.023	U	0.02	U	0.019	U	0.021	U	0.023	U		
HEXACHLOROBENZENE	NE	0.3	3.04	0.021	U	0.021	U	0.02	U	0.019	U	0.021	U	0.023	U		
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.023	U	0.023	U	0.039	U	0.037	U	0.043	U	0.045	U		
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.029	U	0.029	U	0.086	U	0.082	U	0.094	U	0.099	U		
HEXACHLOROETHANE	NE	12	42.8	0.024	U	0.024	U	0.039	U	0.037	U	0.043	U	0.045	U		
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.021	U	0.021	U	0.02	U	0.019	U	0.021	U	0.023	U		
ISOPHORONE	NE	510	5120	0.023	U	0.023	U	0.02	U	0.019	U	0.021	U	0.023	U		
M,P-CRESOL	NE	NE	NE	0.044	U	0.044	U	0.028	U	0.027	U	0.031	U	0.033	U		
NAPHTHALENE	NE	3.6	43.0	0.021	U	0.021	U	0.031	U	0.03	U	0.034	U	0.036	U		
NITROBENZENE	NE	4.8	53.5	0.031	U	0.031	U	0.02	U	0.019	U	0.021	U	0.023	U		
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.023	U	0.023	U	0.02	U	0.019	U	0.021	U	0.023	U		
N-NITROSODIPHENYLAMINE	NE	99	993	0.042	U	0.042	U	0.02	U	0.019	U	0.021	U	0.023	U		
PENTACHLOROPHENOL	NE	0.89	8.94	0.17	U	0.17	U	0.24	U	0.22	U	0.26	U	0.27	U		
PHENANTHRENE	NE	1830	1830	0.021	U	0.021	U	0.02	U	0.019	U	0.021	U	0.023	U		
PHENOL	NE	18000	18300	0.034	U	0.035	U	0.02	U	0.019	U	0.021	U	0.023	U		
PYRENE	NE	1700	1720	0.021	U	0.021	U	0.02	U	0.019	U	0.021	U	0.023	U		

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Soil Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC530-CS-0001-101812		OTC530-CS-0002-101812		OTC530-IS-0001-071712		OTC530-IS-0002-071712-FD		OTC530-IS-0003-071712		OTC530-IS-0004-071712	
				Sample Date		10/18/2012		10/18/2012		7/17/2012		7/17/2012		7/17/2012		7/17/2012	
				Location		CON1, under tank		CON2, under tank		Station 1, tank influent		Station 1, tank influent		Station 1, tank influent		Station 2, septic tank	
				Depth (ft bgs)		6 - 6.25		6 - 6.25		3 - 5		3 - 5		10 - 12		7 - 9	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																	
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.059	U	0.062	U	0.06	U	0.06	U	0.073	U	0.059	U		
1,3-DINITROBENZENE	NE	6.10	NE	0.059	U	0.062	U	0.06	U	0.06	U	0.073	U	0.059	U		
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.059	U	0.062	U	0.06	U	0.06	U	0.073	U	0.059	U		
2,4-DINITROTOLUENE	NE	1.60	15.7	0.059	U	0.062	U	0.073	U	0.073	U	0.089	U	0.072	U		
2,6-DINITROTOLUENE	NE	61.0	61.1	0.059	U	0.062	U	0.065	U	0.065	U	0.08	U	0.065	U		
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.059	U	0.062	U	0.06	U	0.06	U	0.073	U	0.059	U		
2-NITROTOLUENE	NE	2.90	29.1	0.059	U	0.062	U	0.06	U	0.06	U	0.073	U	0.059	U		
3-NITROTOLUENE	NE	6.10	7.82	0.059	U	0.062	U	0.06	U	0.06	U	0.073	U	0.059	U		
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.059	U	0.062	U	0.06	U	0.06	U	0.073	U	0.059	U		
4-NITROTOLUENE	NE	30.0	244.4	0.059	U	0.062	U	0.076	U	0.076	U	0.093	U	0.075	U		
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.059	U	0.062	U	0.06	U	0.06	U	0.073	U	0.059	U		
NITROBENZENE	NE	4.80	53.5	0.059	U	0.062	U	0.07	U	0.07	U	0.085	U	0.069	U		
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.059	U	0.062	U	0.06	U	0.06	U	0.073	U	0.059	U		
TETRYL	NE	240.0	244.0	0.059	U	0.062	U	0.06	U	0.06	U	0.073	U	0.059	U		
METALS (mg/kg)																	
ALUMINUM	13722	77000	78000	**6460**		**6990**		**7270**		**8450**		**4410**		**6820**			
ANTIMONY	1.6	31	31.3	0.85	U	0.87	U	0.97	U	0.95	U	1.1	U	1	U		
ARSENIC	3.7	0.39	3.90	**1.7**	J	**1.9**	J	**1.9**	J	**1.7**	J	**1.5**	J	**1.9**	J		
BARIUM	169.3	15000	15600	**62.7**	J	**58.8**	J	**64.8**	J	**72.5**	J	**72.1**	J	**131**			
BERYLLIUM	1.6	160	156	**0.3**	J	**0.32**	J	0.48	U	0.47	U	0.55	U	0.52	U		
CADMIUM	0.3	70	70.3	0.22	U	0.23	U	0.48	U	0.47	U	0.55	U	0.52	U		
CALCIUM	317332	NE	NE	**147000**		**132000**		**110000**		**87100**		**291000**		**264000**			
CHROMIUM[d]	25	117000	117000	**5.7**		**6.3**		**6.7**		**8.4**		**5.4**	J	**5.9**			
COBALT	7.7	23	NE	**2.6**	J	**2.6**	J	**2.6**	J	**2.7**	J	**1.5**	J	**2.1**	J		
COPPER	13	3100	3130	**5.7**	J	**5.6**	J	**4.9**	J	**6.1**	J	**2.6**	J	**3.2**	J		
IRON	23049	55000	54800	**5740**		**6270**		**6450**		**7690**		**3880**		**5630**			
LEAD	10.9	400	400	**7.1**	J	**6.3**	J	**2.8**	J	**4.3**	J	**4.1**	J	**4.3**	J		
MAGNESIUM	16991	NE	NE	**3480**		**3690**		**3080**		**3940**		**2810**		**4470**			
MANGANESE	393	1800	1860	**123**		**131**		**118**		**143**		**61.4**		**63.8**			
MERCURY	0.0108	10	15.6	**0.0072**	J	**0.005**	J	0.0094	U	0.0092	U	0.01	U	0.011	U		
NICKEL	17.4	1500	1560	**5.9**	J	**7.2**	J	**5.7**	J	**6.5**	J	**6.5**	J	**5.4**	J		
POTASSIUM	5077	NE	NE	**1620**	J	**1750**	J	**1920**	J	**2250**	J	**2250**	J	**1530**	J		
SELENIUM	1.4	390	391	1.3	U	1.4	U	1.9	U	1.9	U	1.9	U	2.1	U		
SILVER	1.1	390	391	0.22	U	0.23	U	0.48	U	0.47	U	0.47	U	0.52	U		
SODIUM	5196	NE	NE	**248**	J	**296**	J	530	U	520	U	520	U	570	U		
THALLIUM	1.3	0.78	0.782	0.80	U	0.83	U	1.3	U	1.2	U	1.2	U	1.3	U		
VANADIUM	42.6	390	391	**11.5**	J	**12.3**	J	**13.9**	J	**14.5**	J	**14.5**	J	**17.1**	J		
ZINC	54.6	23000	23500	**18.9**		**21.3**		**18.7**		**23.1**		**23.1**		**13.7**			

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Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC530-CS-0001-101812		OTC530-CS-0002-101812		OTC530-IS-0001-071712		OTC530-IS-0002-071712-FD		OTC530-IS-0003-071712		OTC530-IS-0004-071712	
				Sample Date		10/18/2012		10/18/2012		7/17/2012		7/17/2012		7/17/2012		7/17/2012	
				Location		CON1, under tank		CON2, under tank		Station 1, tank influent		Station 1, tank influent		Station 1, tank influent		Station 2, septic tank	
				Depth (ft bgs)		6 - 6.25		6 - 6.25		3 - 5		3 - 5		10 - 12		7 - 9	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																	
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0086	U	0.0086	U	0.0077	U	0.0075	U	0.0085	U	0.0089	U		
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.011	U	0.011	U	0.0097	U	0.0094	U	0.011	U	0.011	U		
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.011	U	0.011	U	0.0097	U	0.0094	U	0.011	U	0.011	U		
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0086	U	0.0086	U	0.0077	U	0.0075	U	0.0085	U	0.0089	U		
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0086	U	0.0086	U	0.0077	U	0.0075	U	0.0085	U	0.0089	U		
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0086	U	0.0086	U	0.0077	U	0.0075	U	0.0085	U	0.0089	U		
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0086	U	0.0086	U	0.0077	U	0.0075	U	0.0085	U	0.0089	U		
PETROLEUM HYDROCARBONS (mg/kg)																	
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	2.7	U	2.7	U	3	U	3.3	U	3.2	U	3.4	U		
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	4.3	U	4.2	U	**10.1**		**7.52**	J	4.3	U	4.6	U		
OIL RANGE ORGANICS C28-C40	NE	NE	1000	**10.5**	J	**19.4**		**41.5**		**33.4**		**9.56**	J	4.6	U		
CYANIDE (mg/kg)																	
CYANIDE	NE	22.0	46.9	0.077	U	0.077	U	0.067	U	0.067	U	0.078	U	0.082	U		
TRITIUM (pCi/g)																	
TRITIUM	NE	NE	NE	4.45	U	4.6	U	4.25	U	4.29	U	4.23	U	4.14	U		

Table 4-1
Soil Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC530-IS-0005-071712		OTC530-IS-0006-082912		OTC530-IS-0007-082912		OTC530-IS-0008-081312		OTC530-SL-0001-071712	
				Sample Date		7/17/2012		8/29/2012		8/29/2012		8/29/2012		7/17/2012	
				Location		Station 2, septic tank		Station 3, MW-01		Station 3, MW-01		Station 3, MW-01		Sludge	
				Depth (ft bgs)		14 - 16		0 - 2		3 - 5		10 - 12		NA	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE	**76.4**		**81.4**		**83.5**		**84**		**77.7**	
VOLATILES (mg/kg)															
1,1,1-TRICHLOROETHANE	NE	8700	15600	0.0011	U	0.0012	U	0.0011	U	0.00084	U	0.00088	UJ
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02	0.0012	U	0.0013	U	0.0012	U	0.00092	U	0.00096	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100	0.0017	U	0.0018	U	0.0016	U	0.0013	U	0.0014	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81	0.0011	U	0.0012	U	0.0011	U	0.00084	U	0.00088	U
1,1-DICHLOROETHANE	NE	3.3	64.5	0.0011	U	0.0012	U	0.0011	U	0.00084	U	0.00088	U
1,1-DICHLOROETHENE	NE	240	449	0.0014	U	0.0015	U	0.0013	U	0.0011	U	0.0011	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0	0.0012	U	0.0013	U	0.0012	U	0.00092	U	0.00096	UJ
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86	0.0023	U	0.0025	U	0.0022	U	0.0018	U	0.0018	U
1,2-DIBROMOETHANE	NE	0.034	0.588	0.001	U	0.0011	U	0.00096	U	0.00077	U	0.0008	U
1,2-DICHLOROBENZENE	NE	1900	2310	0.0011	U	0.0012	U	0.0011	U	0.00084	U	0.00088	UJ
1,2-DICHLOROETHANE	NE	0.43	7.89	0.001	U	0.0011	U	0.00096	U	0.00077	U	0.0008	U
1,2-DICHLOROPROPANE	NE	0.94	15.2	0.0012	U	0.0013	U	0.0012	U	0.00092	U	0.00096	U
1,3-DICHLOROBENZENE	NE	NE	NE	0.0012	U	0.0013	U	0.0012	U	0.00092	U	0.00096	UJ
1,4-DICHLOROBENZENE	NE	2.4	31.7	0.0011	U	0.0012	U	0.0011	U	0.00084	U	0.00088	UJ
2-HEXANONE	NE	210	NE	0.0055	U	0.0058	U	0.0052	U	0.0041	U	0.0043	UJ
ACETONE	NE	61000	66600	0.02	U	0.021	U	0.019	U	0.015	U	0.016	U
BENZENE	NE	1.1	15.4	0.0015	U	0.0016	U	0.0014	U	0.0012	U	0.0012	U
BROMODICHLOROMETHANE	NE	0.27	5.41	0.0011	U	0.0012	U	0.0011	U	0.00084	U	0.00088	U
BROMOFORM	NE	62	616	0.0015	U	0.0016	U	0.0014	U	0.0012	U	0.0012	U
BROMOMETHANE	NE	7.3	16.5	0.002	U	0.0021	U	0.0019	U	0.0015	U	0.0016	U
CARBON DISULFIDE	NE	820	1530	0.002	U	0.0021	U	0.0019	U	0.0015	U	0.0016	U
CARBON TETRACHLORIDE	NE	0.61	10.8	0.0018	U	0.0019	U	0.0017	U	0.0014	U	0.0014	UJ
CHLOROBENZENE	NE	290	376	0.001	U	0.0011	U	0.00096	U	0.00077	U	0.0008	UJ
CHLOROETHANE	NE	15000	29800	0.002	U	0.0021	U	0.0019	U	0.0015	UJ	0.0016	U
CHLOROFORM	NE	0.29	5.86	0.0012	U	0.0013	U	0.0012	U	0.00092	U	0.00096	U
CHLOROMETHANE	NE	120	275	0.002	U	0.0021	U	0.0019	U	0.0015	U	0.0016	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156	0.0015	U	0.0016	U	0.0014	U	0.0012	U	0.0012	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	0.001	U	0.0011	U	0.00096	U	0.00077	U	0.0008	U
CYCLOHEXANE	NE	7000	NE	0.0014	U	0.0015	U	0.0013	U	0.0011	U	0.0011	UJ
DIBROMOCHLOROMETHANE	NE	0.68	12.1	0.001	U	0.0011	U	0.00096	U	0.00077	U	0.0008	U
DICHLORODIFLUOROMETHANE	NE	94	168	0.0015	U	0.0016	U	0.0014	U	0.0012	U	0.0012	U
ETHYLBENZENE	NE	5.4	68.4	0.001	U	0.0011	U	0.00096	U	0.00077	U	0.0008	UJ
ISOPROPYLBENZENE	NE	2100	2430	0.0011	U	0.0012	U	0.0011	U	0.00084	U	0.00088	UJ
METHYL ACETATE	NE	78000	78200	0.013	U	0.013	U	0.012	U	0.0096	U	0.01	U
METHYL ETHYL KETONE	NE	28000	37100	0.0062	U	0.0065	U	0.0059	U	0.0047	U	0.0049	U
METHYL ISOBUTYL KETONE	NE	5300	5820	0.0056	U	0.0059	U	0.0053	U	0.0042	U	0.0044	U
METHYLCYCLOHEXANE	NE	5630	5630	0.0013	U	0.0014	U	0.0012	U	0.001	U	0.001	UJ
METHYLENE CHLORIDE	NE	56	409	0.0047	U	0.0049	U	0.0044	U	0.0035	U	0.0037	U

Table 4-1
Soil Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC530-IS-0005-071712		OTC530-IS-0006-082912		OTC530-IS-0007-082912		OTC530-IS-0008-081312		OTC530-SL-0001-071712	
				Sample Date		7/17/2012		8/29/2012		8/29/2012		8/29/2012		7/17/2012	
				Location		Station 2, septic tank		Station 3, MW-01		Station 3, MW-01		Station 3, MW-01		Sludge	
				Depth (ft bgs)		14 - 16		0 - 2		3 - 5		10 - 12		NA	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)															
STYRENE	NE	6300	7280	0.0026	U	0.0028	U	0.0025	U	0.002	U	0.0021	UJ		
TERT-BUTYL METHYL ETHER	NE	43	901	0.002	U	0.0021	U	0.0019	U	0.0015	U	0.0016	U		
TETRACHLOROETHYLENE	NE	22	7.02	0.001	U	0.0011	U	0.00096	U	0.00077	U	0.0008	U		
TOLUENE	NE	5000	5270	0.0012	U	0.0013	U	0.0012	U	0.00092	U	0.00096	UJ		
TRANS-1,2-DICHLOROETHENE	NE	150	270	0.0015	U	0.0016	U	0.0014	U	0.0012	U	0.0012	U		
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.0011	U	0.0012	U	0.0011	U	0.00084	U	0.00088	U		
TRICHLOROETHYLENE	NE	0.91	8.77	0.0012	U	0.0013	U	0.0012	U	0.00092	U	0.00096	UJ		
TRICHLOROFLUOROMETHANE	NE	790	1410	0.002	U	0.0021	U	0.0019	U	0.0015	UJ	0.0016	U		
VINYL CHLORIDE	NE	0.06	0.728	0.0015	U	0.0016	U	0.0014	U	0.0012	U	0.0012	U		
XYLENES, TOTAL	NE	630	814	0.0033	U	0.0034	U	0.0031	U	0.0025	U	0.0026	UJ		
SEMIVOLATILES (mg/kg)															
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
2,4,5-TRICHLOROPHENOL	NE	6100	6110	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
2,4,6-TRICHLOROPHENOL	NE	44	61.1	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
2,4-DICHLOROPHENOL	NE	180	183	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
2,4-DIMETHYLPHENOL	NE	1200	1220	0.027	U	0.026	U	0.025	U	0.025	U	0.027	U		
2,4-DINITROPHENOL	NE	120	122	0.43	U	0.41	U	0.4	U	0.4	U	0.42	U		
2,4-DINITROTOLUENE	NE	1.6	15.7	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
2,6-DINITROTOLUENE	NE	61	61.1	0.026	U	0.024	U	0.024	U	0.024	U	0.025	U		
2-CHLORONAPHTHALENE	NE	6300	6260	0.043	U	0.041	U	0.04	U	0.04	U	0.042	U		
2-CHLOROPHENOL	NE	390	391	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
2-METHYLNAPHTHALENE	NE	230	NE	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
2-METHYLPHENOL	NE	3100	NE	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
2-NITROANILINE	NE	610	NE	0.043	U	0.041	U	0.04	U	0.04	U	0.042	U		
2-NITROPHENOL	NE	NE	NE	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	0.043	U	0.041	U	0.04	U	0.04	U	0.042	U		
3-NITROANILINE	NE	NE	NE	0.043	U	0.041	U	0.04	U	0.04	U	0.042	U		
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	0.087	U	0.082	U	0.081	U	0.08	U	0.085	U		
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
4-CHLOROANILINE	NE	2.4	NE	0.022	U	0.02	UJ	0.02	U	0.02	U	0.021	U		
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
4-NITROANILINE	NE	24	NE	0.043	U	0.041	U	0.04	U	0.04	U	0.042	U		
4-NITROPHENOL	NE	NE	NE	0.17	U	0.16	U	0.16	U	0.16	U	0.17	U		
ACENAPHTHENE	NE	3400	3440	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
ACENAPHTHYLENE	NE	NE	NE	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
ACETOPHENONE	NE	7800	7820	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
ANTHRACENE	NE	17000	17200	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
ATRAZINE	NE	2.1	NE	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		

Table 4-1
Soil Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC530-IS-0005-071712		OTC530-IS-0006-082912		OTC530-IS-0007-082912		OTC530-IS-0008-081312		OTC530-SL-0001-071712	
				Sample Date		7/17/2012		8/29/2012		8/29/2012		8/29/2012		7/17/2012	
				Location		Station 2, septic tank		Station 3, MW-01		Station 3, MW-01		Station 3, MW-01		Sludge	
				Depth (ft bgs)		14 - 16		0 - 2		3 - 5		10 - 12		NA	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)															
BENZALDEHYDE	NE	7800	NE	0.22	U	0.2	U	0.2	U	0.2	U	0.2	U	0.21	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.022	U	0.02	U	0.02	U	0.02	U	**0.07**	J		
BENZO(A)PYRENE	NE	0.015	0.148	0.022	U	0.02	U	0.02	U	0.02	U	**0.187**	J		
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.022	U	0.02	U	0.02	U	0.02	U	**0.196**	J		
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.022	U	0.02	U	0.02	U	0.02	U	**0.126**	J		
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.022	U	0.02	U	0.02	U	0.02	U	**0.216**			
BENZYL BUTYL PHTHALATE	NE	260	NE	0.043	U	0.041	U	0.04	U	0.04	U	0.042	U		
BIPHENYL	NE	51	57.1	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.087	U	0.082	U	0.081	U	0.08	U	0.085	U		
CAPROLACTAM	NE	31000	NE	0.069	U	0.066	U	0.065	U	0.064	U	0.068	U		
CARBAZOLE	NE	NE	NE	0.022	U	0.02	U	0.02	U	0.02	U	**0.027**	J		
CHRYSENE	NE	15	148	0.022	U	0.02	U	0.02	U	0.02	U	**0.202**	J		
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.022	U	0.02	U	0.02	U	0.02	U	**0.0229**	J		
DIBENZOFURAN	NE	78	NE	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
DIETHYL PHTHALATE	NE	49000	48900	0.087	U	0.082	U	0.081	U	0.08	U	0.085	U		
DIMETHYL PHTHALATE	NE	611000	611000	0.043	U	0.041	U	0.04	U	0.04	U	0.042	U		
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.087	U	0.082	U	0.081	U	0.08	U	0.085	U		
DI-N-OCTYLPHTHALATE	NE	730	NE	0.043	U	0.041	U	0.04	U	0.04	U	0.042	U		
FLUORANTHENE	NE	2300	2290	0.022	U	0.02	U	0.02	U	0.02	U	**0.0647**	J		
FLUORENE	NE	2300	2290	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
HEXACHLOROBENZENE	NE	0.3	3.04	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.043	U	0.041	U	0.04	U	0.04	U	0.042	U		
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.095	U	0.09	U	0.089	U	0.088	U	0.093	U		
HEXACHLOROETHANE	NE	12	42.8	0.043	U	0.041	U	0.04	U	0.04	U	0.042	U		
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.022	U	0.02	U	0.02	U	0.02	U	**0.143**	J		
ISOPHORONE	NE	510	5120	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
M,P-CRESOL	NE	NE	NE	0.031	U	0.029	U	0.029	U	0.029	U	0.031	U		
NAPHTHALENE	NE	3.6	43.0	0.035	U	0.033	U	0.032	U	0.032	U	0.034	U		
NITROBENZENE	NE	4.8	53.5	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
N-NITROSODIPHENYLAMINE	NE	99	993	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
PENTACHLOROPHENOL	NE	0.89	8.94	0.26	U	0.25	U	0.24	U	0.24	U	0.25	U		
PHENANTHRENE	NE	1830	1830	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
PHENOL	NE	18000	18300	0.022	U	0.02	U	0.02	U	0.02	U	0.021	U		
PYRENE	NE	1700	1720	0.022	U	0.02	U	0.02	U	0.02	U	**0.056**	J		

Table 4-1
Soil Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC530-IS-0005-071712		OTC530-IS-0006-082912		OTC530-IS-0007-082912		OTC530-IS-0008-081312		OTC530-SL-0001-071712	
			Sample Date	7/17/2012		8/29/2012		8/29/2012		8/29/2012		7/17/2012	
			Location	Station 2, septic tank		Station 3, MW-01		Station 3, MW-01		Station 3, MW-01		Sludge	
			Depth (ft bgs)	14 - 16		0 - 2		3 - 5		10 - 12		NA	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)													
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.075	U	0.062	U	0.071	U	0.07	U	0.056	U
1,3-DINITROBENZENE	NE	6.10	NE	0.075	U	0.062	U	0.071	U	0.07	U	0.056	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.075	U	0.062	U	0.071	U	0.07	U	0.056	U
2,4-DINITROTOLUENE	NE	1.60	15.7	0.091	U	0.075	U	0.087	U	0.085	U	0.067	U
2,6-DINITROTOLUENE	NE	61.0	61.1	0.081	U	0.067	U	0.078	U	0.076	U	0.06	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.075	U	0.062	U	0.071	U	0.07	U	0.056	U
2-NITROTOLUENE	NE	2.90	29.1	0.075	U	0.062	U	0.071	U	0.07	U	0.056	U
3-NITROTOLUENE	NE	6.10	7.82	0.075	U	0.062	U	0.071	U	0.07	U	0.056	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.075	U	0.062	U	0.071	U	0.07	U	0.056	U
4-NITROTOLUENE	NE	30.0	244.4	0.094	U	0.078	U	0.09	U	0.089	U	0.07	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.075	U	0.062	U	0.071	U	0.07	U	0.056	U
NITROBENZENE	NE	4.80	53.5	0.087	U	0.072	U	0.083	U	0.082	U	0.065	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.075	U	0.062	U	0.071	U	0.07	U	0.056	U
TETRYL	NE	240.0	244.0	0.075	U	0.062	U	0.071	U	0.07	U	0.056	U
METALS (mg/kg)													
ALUMINUM	13722	77000	78000	**6120**		**5580**		**10600**		**6970**		**6540**	
ANTIMONY	1.6	31	31.3	1.2	U	0.88	U	1.1	U	1.1	U	0.88	U
ARSENIC	3.7	0.39	3.90	1.2	U	**1.2**	J	**2.1**	J	**3**	J	**2.2**	J
BARIUM	169.3	15000	15600	**42.1**	J	**56.8**	J	**77.3**	J	**203**		**55.6**	J
BERYLLIUM	1.6	160	156	0.58	U	0.44	U	0.53	U	0.54	U	0.44	U
CADMIUM	0.3	70	70.3	0.58	U	0.44	U	0.53	U	0.54	U	0.44	U
CALCIUM	317332	NE	NE	**187000**		**207000**		**88900**		**180000**		**101000**	
CHROMIUM[d]	25	117000	117000	**6.9**		**5.7**		**9.7**		**10.6**		**11.9**	
COBALT	7.7	23	NE	**1.6**	J	**2.1**	J	**3.8**	J	**2.5**	J	**2.5**	J
COPPER	13	3100	3130	**2.2**	J	**5.4**	J	**7.3**	J	**6.3**	J	**9.9**	J
IRON	23049	55000	54800	**5200**		**5230**		**9860**		**6060**		**8270**	
LEAD	10.9	400	400	**3.1**	J	**3.2**	J	**6.1**	J	**3.2**	J	**13.6**	
MAGNESIUM	16991	NE	NE	**3500**		**5570**		**4760**		**2730**		**4600**	
MANGANESE	393	1800	1860	**86.7**		**117**		**203**		**73.7**		**150**	
MERCURY	0.0108	10	15.6	0.01	U	0.0095	U	0.014	J	0.0093	U	0.0099	U
NICKEL	17.4	1500	1560	**4.8**	J	**4.9**	J	**8.2**	J	**6.1**	J	**6.1**	J
POTASSIUM	5077	NE	NE	**1420**	J	**1670**	J	**2920**	J	**1470**	J	**1800**	J
SELENIUM	1.4	390	391	2.3	U	1.8	U	2.1	U	2.1	U	1.8	U
SILVER	1.1	390	391	0.58	U	0.44	U	0.53	U	0.54	U	0.44	U
SODIUM	5196	NE	NE	640	U	490	U	580	U	590	U	480	U
THALLIUM	1.3	0.78	0.782	1.5	U	1.1	U	1.4	U	1.4	U	1.1	U
VANADIUM	42.6	390	391	**15.2**	J	**11.9**	J	**19.3**	J	**13.9**	J	**11.8**	J
ZINC	54.6	23000	23500	**15.2**		**15.8**		**32.4**		**24.5**		**48.9**	

Table 4-1
Soil Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC530-IS-0005-071712		OTC530-IS-0006-082912		OTC530-IS-0007-082912		OTC530-IS-0008-081312		OTC530-SL-0001-071712	
				Sample Date		7/17/2012		8/29/2012		8/29/2012		8/29/2012		7/17/2012	
				Location		Station 2, septic tank		Station 3, MW-01		Station 3, MW-01		Station 3, MW-01		Sludge	
				Depth (ft bgs)		14 - 16		0 - 2		3 - 5		10 - 12		NA	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)															
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0086	U	0.0081	U	0.0079	U	0.0079	U	0.0086	U		
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.011	U	0.01	U	0.0099	U	0.0099	U	0.011	U		
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.011	U	0.01	U	0.0099	U	0.0099	U	0.011	U		
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0086	U	0.0081	U	0.0079	U	0.0079	U	0.0086	U		
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0086	U	0.0081	U	0.0079	U	0.0079	U	0.0086	U		
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0086	U	0.0081	U	0.0079	U	0.0079	U	0.0086	U		
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0086	U	0.0081	U	0.0079	U	0.0079	U	0.0086	U		
PETROLEUM HYDROCARBONS (mg/kg)															
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	3.7	U	3.2	U	2.5	U	3	U	3.4	U		
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	4.3	U	**38.1**		7.9	U	4	U	**8.34**	J		
OIL RANGE ORGANICS C28-C40	NE	NE	1000	4.3	U	**116**		**68.6**		**8.73**		**48.9**			
CYANIDE (mg/kg)															
CYANIDE	NE	22.0	46.9	0.074	U	0.074	U	0.07	U	0.069	U	0.074	U		
TRITIUM (pCi/g)															
TRITIUM	NE	NE	NE	4.22	U	4.17	U	4.07	U	4.16	U	4.15	U		

Table 4-1
Soil Analytical Data
Buidling 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

CON = confirmation sample
dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Table 4-2
Groundwater Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC530-GW-5301-100312	
			Sample date	10/3/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NMWQCC WQS (µg/L)[c]**	Result	VQ
TOTAL DISSOLVED SOLIDS (mg/L)	NE	NE	10,000	**3680**	
VOLATILES (µg/L)					
1,1,1-TRICHLOROETHANE	NE	200	60	0.2	U
1,1,2,2-TETRACHLOROETHANE	NE	NE	10	0.24	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	NE	NE	0.33	U
1,1,2-TRICHLOROETHANE	NE	5	10	0.2	U
1,1-DICHLOROETHANE	NE	NE	25	0.21	U
1,1-DICHLOROETHENE	NE	7	5	0.2	U
1,2,4-TRICHLOROBENZENE	NE	70	NE	0.5	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.20	NE	0.71	U
1,2-DIBROMOETHANE	NE	0.05	0.10	0.3	U
1,2-DICHLOROBENZENE	NE	600	NE	0.22	U
1,2-DICHLOROETHANE	NE	5	10	0.22	U
1,2-DICHLOROPROPANE	NE	5	NE	0.26	U
1,3-DICHLOROBENZENE	NE	NE	NE	0.25	U
1,4-DICHLOROBENZENE	NE	75	NE	0.2	U
2-HEXANONE	NE	NE	NE	2	U
ACETONE	NE	NE	NE	10	U
BENZENE	NE	5	10	0.21	U
BROMODICHLOROMETHANE	NE	80	NE	0.2	U
BROMOFORM	NE	80	NE	0.34	U
BROMOMETHANE	NE	NE	NE	0.79	U
CARBON DISULFIDE	NE	NE	NE	0.49	U
CARBON TETRACHLORIDE	NE	5	10	0.31	U
CHLOROBENZENE	NE	100	NE	0.2	U
CHLOROETHANE	NE	NE	NE	0.5	U
CHLOROFORM	NE	80	100	0.26	U

Table 4-2
Groundwater Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC530-GW-5301-100312	
			Sample date	10/3/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NMWQCC WQS (µg/L)[c]**	Result	VQ
VOLATILES - continued (µg/L)					
CHLOROMETHANE	NE	NE	NE	0.5	U
CIS-1,2-DICHLOROETHYLENE	NE	70	NE	0.24	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	0.22	U
CYCLOHEXANE	NE	NE	NE	0.48	U
DIBROMOCHLOROMETHANE	NE	80	NE	0.2	U
DICHLORODIFLUOROMETHANE	NE	NE	NE	0.5	UJ
ETHYLBENZENE	NE	700	750	0.29	U
ISOPROPYLBENZENE	NE	NE	NE	0.2	U
METHYL ACETATE	NE	NE	NE	5	U
METHYL ETHYL KETONE	NE	NE	NE	3.1	U
METHYL ISOBUTYL KETONE	NE	NE	NE	2.3	U
METHYLCYCLOHEXANE	NE	NE	NE	0.2	U
METHYLENE CHLORIDE	NE	5	100	2	U
STYRENE	NE	100	NE	0.2	U
TERT-BUTYL METHYL ETHER	NE	NE	NE	0.21	U
TETRACHLOROETHYLENE	NE	5	20	0.32	U
TOLUENE	NE	1000	750	0.2	U
TRANS-1,2-DICHLOROETHENE	NE	100	NE	0.23	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.21	U
TRICHLOROETHYLENE	NE	5	100	0.31	U
TRICHLOROFLUOROMETHANE	NE	NE	NE	0.5	U
VINYL CHLORIDE	NE	2	1	0.44	U
XYLENES, TOTAL	NE	10000	620	0.5	U

Table 4-2
Groundwater Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC530-GW-5301-100312	
			Sample date	10/3/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NMWQCC WQS (µg/L)[c]	Result	VQ
SEMIVOLATILES (µg/L)					
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	0.75	U
2,4,5-TRICHLOROPHENOL	NE	NE	NE	0.85	U
2,4,6-TRICHLOROPHENOL	NE	NE	NE	0.74	U
2,4-DICHLOROPHENOL	NE	NE	NE	0.67	U
2,4-DIMETHYLPHENOL	NE	NE	NE	0.73	U
2,4-DINITROPHENOL	NE	NE	NE	5	U
2,4-DINITROTOLUENE	NE	NE	NE	0.65	U
2,6-DINITROTOLUENE	NE	NE	NE	0.77	U
2-CHLORONAPHTHALENE	NE	NE	30	0.69	U
2-CHLOROPHENOL	NE	NE	NE	0.67	U
2-METHYLNAPHTHALENE	NE	NE	30	0.66	U
2-METHYLPHENOL (O-CRESOL)	NE	NE	NE	0.69	U
2-NITROANILINE	NE	NE	NE	0.72	U
2-NITROPHENOL	NE	NE	NE	0.64	U
3,3'-DICHLOROBENZIDINE	NE	NE	NE	0.7	U
3-NITROANILINE	NE	NE	NE	0.62	U
4,6-DINITRO-2-METHYLPHENOL	NE	NE	NE	1.4	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.75	U
4-CHLORO-3-METHYLPHENOL	NE	NE	NE	0.77	U
4-CHLOROANILINE	NE	NE	NE	0.65	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.83	U
4-NITROANILINE	NE	NE	NE	0.92	U
4-NITROPHENOL	NE	NE	NE	4.8	U
ACENAPHTHENE	NE	NE	30	0.67	U
ACENAPHTHYLENE	NE	NE	30	0.66	U
ACETOPHENONE	NE	NE	NE	0.71	U
ANTHRACENE	NE	NE	30	0.71	U

Table 4-2
Groundwater Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC530-GW-5301-100312	
			Sample date	10/3/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NMWQCC WQS (µg/L)[c]	Result	VQ
SEMIVOLATILES - continued (µg/L)					
ATRAZINE	NE	3	NE	0.82	U
BENZALDEHYDE	NE	NE	NE	4.8	U
BENZO(A)ANTHRACENE	NE	NE	30	0.52	U
BENZO(A)PYRENE	NE	0.20	0.7	0.54	U
BENZO(B)FLUORANTHENE	NE	NE	30	0.72	U
BENZO(G,H,I)PERYLENE	NE	NE	30	0.63	U
BENZO(K)FLUORANTHENE	NE	NE	30	0.64	U
BENZYL BUTYL PHTHALATE	NE	NE	NE	0.68	U
BIPHENYL	NE	NE	NE	0.91	U
BIS(2-CHLOROETHOXY) METHANE	NE	NE	NE	0.66	U
BIS(2-CHLOROETHYL) ETHER	NE	NE	NE	0.68	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	6	NE	1.1	U
CAPROLACTAM	NE	NE	NE	2.4	U
CARBAZOLE	NE	NE	NE	0.5	U
CHRYSENE	NE	NE	30	0.56	U
DIBENZ(A,H)ANTHRACENE	NE	NE	30	0.56	U
DIBENZOFURAN	NE	NE	NE	0.71	U
DIETHYL PHTHALATE	NE	NE	NE	0.95	U
DIMETHYL PHTHALATE	NE	NE	NE	0.77	U
DI-N-BUTYL PHTHALATE	NE	NE	NE	0.95	U
DI-N-OCTYLPHTHALATE	NE	NE	NE	0.95	U
FLUORANTHENE	NE	NE	30	0.56	U
FLUORENE	NE	NE	30	0.73	U
HEXACHLOROBENZENE	NE	1	NE	0.65	U
HEXACHLOROBUTADIENE	NE	NE	NE	0.91	U
HEXACHLOROCYCLOPENTADIENE	NE	50	NE	0.76	U
HEXACHLOROETHANE	NE	NE	NE	0.71	U

Table 4-2
Groundwater Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC530-GW-5301-100312	
			Sample date	10/3/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NMWQCC WQS (µg/L)[c]	Result	VQ
SEMIVOLATILES - continued (µg/L)					
INDENO(1,2,3-C,D)PYRENE	NE	NE	30	0.55	U
ISOPHORONE	NE	NE	NE	0.61	U
M,P-CRESOL	NE	NE	NE	1.3	U
NAPHTHALENE	NE	NE	30	0.61	U
NITROBENZENE	NE	NE	NE	0.69	U
N-NITROSODI-N-PROPYLAMINE	NE	NE	NE	0.81	U
N-NITROSODIPHENYLAMINE	NE	NE	NE	0.95	U
PENTACHLOROPHENOL	NE	1	NE	4.8	U
PHENANTHRENE	NE	NE	30	0.67	U
PHENOL	NE	NE	NE	0.52	U
PYRENE	NE	NE	30	0.65	U
EXPLOSIVES (µg/L)					
1,3,5-TRINITROBENZENE	NE	NE	NE	0.078	U
1,3-DINITROBENZENE	NE	NE	NE	0.078	U
2,4,6-TRINITROTOLUENE	NE	NE	NE	0.078	U
2,4-DINITROTOLUENE	NE	NE	NE	0.078	U
2,6-DINITROTOLUENE	NE	NE	NE	0.078	U
2-AMINO-4,6-DINITROTOLUENE	NE	NE	NE	0.078	U
2-NITROTOLUENE	NE	NE	NE	0.078	U
3-NITROTOLUENE	NE	NE	NE	0.078	U
4-AMINO-2,6-DINITROTOLUENE	NE	NE	NE	0.078	U
4-NITROTOLUENE	NE	NE	NE	0.078	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	NE	NE	0.078	U
NITROBENZENE	NE	NE	NE	0.078	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	NE	NE	0.078	U
TETRYL	NE	NE	NE	0.078	U

Table 4-2
Groundwater Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC530-GW-5301-100312	
			Sample date	10/3/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NMWQCC WQS (µg/L)[c]**	Result	VQ
METALS (µg/L)					
ALUMINUM	1043	NE	NE	**22.9**	J
ANTIMONY	6	6	NE	5.2	U
ARSENIC	10	10	100	2.5	U
BARIUM	38	2000	1000	**41.7**	J
BERYLLIUM	4	4	NE	0.5	U
CADMIUM	5	5	10	2	U
CALCIUM	1,136,664	NE	NE	**724000**	
CHROMIUM, TOTAL	12	100	50	8	U
COBALT	36	NE	NE	0.5	U
COPPER	9.8	1300	1000	2.5	J
IRON	300	NE	1000	29	U
LEAD	9	15	50	4.4	U
MAGNESIUM	3,692,782	NE	NE	**99800**	
MANGANESE	50	NE	200	**190**	
MERCURY	0.5	2	2	0.03	U
NICKEL	22	NE	NE	**3.2**	J
POTASSIUM	212,144	NE	NE	**15500**	
SELENIUM	50	50	50	8	U
SILVER	10	NE	50	0.5	U
SODIUM	20,989,580	NE	NE	**334000**	
THALLIUM	2	2	NE	**0.16**	J
VANADIUM	90	NE	NE	**19.5**	J
ZINC	17	NE	10000	20	U

Table 4-2
Groundwater Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC530-GW-5301-100312	
			Sample date	10/3/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NMWQCC WQS (µg/L)[c]**	Result	VQ
PCBs (µg/L)					
PCB-1016 (AROCHLOR 1016)	NE	NE	1	0.19	U
PCB-1221 (AROCHLOR 1221)	NE	NE	1	0.24	U
PCB-1232 (AROCHLOR 1232)	NE	NE	1	0.24	U
PCB-1242 (AROCHLOR 1242)	NE	NE	1	0.19	U
PCB-1248 (AROCHLOR 1248)	NE	NE	1	0.19	U
PCB-1254 (AROCHLOR 1254)	NE	NE	1	0.19	U
PCB-1260 (AROCHLOR 1260)	NE	NE	1	0.19	U
PETROLEUM HYDROCARBONS (µg/L) [d]					
GASOLINE RANGE ORGANICS C6-C10	NE	NE	See individual VOC & SVOC	50	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	400	**161**	J
OIL RANGE ORGANICS C28-C40	NE	NE	200	97	U
CYANIDE (µg/L)					
CYANIDE	NE	200	200	**4.7**	J
TRITIUM (pCi/L)					
TRITIUM	NE	NE	NE	553	U

Table 4-2
Groundwater Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NM WQCC Water Quality Standard

Value exceeds EPA Maximum Contaminant Level

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," letter to D. Scruggs, Chief, Environmental Restoration Program, Holloman Air Force Base from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, New Mexico Environment Department, March 1.*

[b] *U.S. Environmental Protection Agency (EPA), 2012, National Primary Drinking Water Regulations: List of Drinking Water Contaminants and Maximum Contaminant Levels.*

[c] *New Mexico Water Quality Control Commission, Water Quality Standards, 20.6.2 New Mexico Administrative Code.*

[d]New Mexico Environment Department (NMED), 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, New Mexico Environment Department, Santa Fe, New Mexico, February, Table 6-2. TPH Screening Guidelines for Potable Groundwater (GW-1), February 2012, Table A-1: NMED Soil Screening Levels, updated June 2012. "Unknown oil" criteria used for Oil Range Oraganics.

EPA = U.S. Environmental Protection Agency

GW = groundwater

J = estimated value

MCL = Maximum Contaminant Level

µg/L = micrograms per liter

mg/L = milligrams per liter

NA = not analyzed

NE = not established

NMWQCC = New Mexico Water Quality Control Commission

pCi/L = picocuries per liter

RFI = RCRA Facility Investigation

U = not detected at the detection limit shown

VQ = validation qualifier

WQS = Water Quality Standard

Table 4-3
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	LDY-IDW01-090412	
		Sample Date	9/4/2012	
		Sample Type	Waste	
		40 CFR 261 Waste Characteristic Criteria	Result	Lab Qual
General Chemistry				
Corrosivity as pH	pH Units	> 2 and < 12.5	**7.7**	
Cyanide Reactivity	mg/kg	< 250	1.5	U
Ignitability (Flashpoint)	°F	> 140 °F	>200	
Solids, Percent	%	-	**84.4**	
Sulfide Reactivity	mg/kg	< 500	59	U
TCLP Volatiles				
Benzene	mg/L	0.5	0.0020	U
Chlorobenzene	mg/L	100	0.0020	U
Chloroform	mg/L	6	0.0022	U
Carbon tetrachloride	mg/L	0.5	0.0025	U
1,1-Dichloroethylene	mg/L	0.7	0.0023	U
1,2-Dichloroethane	mg/L	0.5	0.0020	U
p-Dichlorobenzene	mg/L	7.5	0.0023	U
Methyl ethyl ketone	mg/L	200	0.0020	U
Tetrachloroethylene	mg/L	0.7	0.0025	U
Trichloroethylene	mg/L	0.5	0.0026	U
Vinyl chloride	mg/L	0.2	0.0022	U
TCLP Semivolatiles				
2-Methylphenol	mg/L	200	0.0054	U
3&4-Methylphenol	mg/L	200	0.011	U
Pentachlorophenol	mg/L	100	0.054	U
2,4,5-Trichlorophenol	mg/L	400	0.0050	U
2,4,6-Trichlorophenol	mg/L	2	0.0050	U
1,4-Dichlorobenzene	mg/L	7.5	0.010	U
2,4-Dinitrotoluene	mg/L	0.13	0.0050	U
Hexachlorobenzene	mg/L	0.13	0.0056	U
Hexachlorobutadiene	mg/L	0.5	0.010	U
Hexachloroethane	mg/L	3	0.010	U
Nitrobenzene	mg/L	2	0.0059	U
Pyridine	mg/L	100	0.016	U
TCLP Metals				
Arsenic	mg/L	5	0.020	U
Barium	mg/L	100	**0.12**	J
Cadmium	mg/L	1	0.010	U
Chromium	mg/L	5	0.010	U
Lead	mg/L	5	0.010	U
Mercury	mg/L	0.2	0.00050	U
Selenium	mg/L	1	0.020	U
Silver	mg/L	5	0.010	U

Table 4-3
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

°F = degrees Fahrenheit
> = greater than
< = less than
% = percent
CFR = Code of Federal Regulations
J = estimated value
Lab Qual = laboratory qualifier
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
TCLP = Toxicity Characteristic Leaching Procedure
U = not detected at the detection limit shown

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles				
Acetone	µg/L	NE	10	U
Benzene	µg/L	5	0.21	U
Bromodichloromethane	µg/L	80	0.20	U
Bromoform	µg/L	80	0.34	U
Chlorobenzene	µg/L	100	0.20	U
Chloroethane	µg/L	NE	0.50	U
Chloroform	µg/L	80	0.26	U
Carbon disulfide	µg/L	NE	0.49	U
Carbon tetrachloride	µg/L	5	0.31	U
Cyclohexane	µg/L	NE	0.48	U
1,1-Dichloroethane	µg/L	NE	0.21	U
1,1-Dichloroethylene	µg/L	7	0.20	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.71	U
1,2-Dibromoethane	µg/L	0.05	0.30	U
1,2-Dichloroethane	µg/L	5	0.22	U
1,2-Dichloropropane	µg/L	5	0.26	U
Dibromochloromethane	µg/L	80	0.20	U
Dichlorodifluoromethane	µg/L	NE	0.50	U
cis-1,2-Dichloroethylene	µg/L	70	**0.42**	J
cis-1,3-Dichloropropene	µg/L	NE	0.22	U
m-Dichlorobenzene	µg/L	NE	0.25	U
o-Dichlorobenzene	µg/L	600	0.22	U
p-Dichlorobenzene	µg/L	75	0.20	U
trans-1,2-Dichloroethylene	µg/L	100	0.23	U
trans-1,3-Dichloropropene	µg/L	NE	0.21	U
Ethylbenzene	µg/L	700	0.29	U
Freon 113	µg/L	NE	0.33	U
2-Hexanone	µg/L	NE	2.0	U
Isopropylbenzene	µg/L	NE	0.20	U
4-Methyl-2-pentanone	µg/L	NE	2.3	U
Methyl Acetate	µg/L	NE	5.0	U
Methyl bromide	µg/L	NE	0.79	U
Methyl chloride	µg/L	NE	0.50	U
Methylcyclohexane	µg/L	NE	0.20	U
Methylene chloride	µg/L	5	2.0	U
Methyl ethyl ketone	µg/L	NE	3.1	U
Methyl Tert Butyl Ether	µg/L	NE	0.21	U
Styrene	µg/L	100	0.20	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles (continued)				
1,1,1-Trichloroethane	µg/L	200	0.20	U
1,1,2,2-Tetrachloroethane	µg/L	NE	0.24	U
1,1,2-Trichloroethane	µg/L	5	0.20	U
1,2,4-Trichlorobenzene	µg/L	70	0.50	U
Tetrachloroethylene	µg/L	5	0.32	U
Toluene	µg/L	1000	0.20	U
Trichloroethylene	µg/L	5	0.31	U
Trichlorofluoromethane	µg/L	NE	0.50	U
Vinyl chloride	µg/L	2	0.44	U
Xylene (total)	µg/L	10000	0.50	U
Semivolatiles				
2-Chlorophenol	µg/L	NE	0.68	U
4-Chloro-3-methyl phenol	µg/L	NE	0.78	U
2,4-Dichlorophenol	µg/L	NE	0.67	U
2,4-Dimethylphenol	µg/L	NE	0.74	U
2,4-Dinitrophenol	µg/L	NE	5.0	U
4,6-Dinitro-o-cresol	µg/L	NE	1.4	U
2-Methylphenol	µg/L	NE	0.69	U
3&4-Methylphenol	µg/L	NE	1.3	U
2-Nitrophenol	µg/L	NE	0.65	U
4-Nitrophenol	µg/L	NE	4.8	U
Pentachlorophenol	µg/L	1	4.8	U
Phenol	µg/L	NE	0.53	U
2,4,5-Trichlorophenol	µg/L	NE	0.86	U
2,4,6-Trichlorophenol	µg/L	NE	0.75	U
Acenaphthene	µg/L	NE	0.67	U
Acenaphthylene	µg/L	NE	0.67	U
Acetophenone	µg/L	NE	0.72	U
Anthracene	µg/L	NE	0.72	U
Atrazine	µg/L	3	0.83	U
Benzaldehyde	µg/L	NE	4.8	U
Benzo(a)anthracene	µg/L	NE	0.52	U
Benzo(a)pyrene	µg/L	0.2	0.55	U
Benzo(b)fluoranthene	µg/L	NE	0.73	U
Benzo(g,h,i)perylene	µg/L	NE	0.64	U
Benzo(k)fluoranthene	µg/L	NE	0.64	U
4-Bromophenyl phenyl ether	µg/L	NE	0.76	U
Butyl benzyl phthalate	µg/L	NE	0.68	U
1,1'-Biphenyl	µg/L	NE	0.92	U
2-Chloronaphthalene	µg/L	NE	0.70	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Semivolatiles (continued)				
4-Chloroaniline	µg/L	NE	0.66	U
Caprolactam	µg/L	NE	2.4	U
Carbazole	µg/L	NE	0.50	U
Chrysene	µg/L	NE	0.56	U
bis(2-Chloroethoxy)methane	µg/L	NE	0.67	U
bis(2-Chloroethyl)ether	µg/L	NE	0.69	U
bis(2-Chloroisopropyl)ether	µg/L	NE	0.76	U
4-Chlorophenyl phenyl ether	µg/L	NE	0.84	U
2,4-Dinitrotoluene	µg/L	NE	0.66	U
2,6-Dinitrotoluene	µg/L	NE	0.77	U
3,3'-Dichlorobenzidine	µg/L	NE	0.71	U
Dibenzo(a,h)anthracene	µg/L	NE	0.56	U
Dibenzofuran	µg/L	NE	0.72	U
Di-n-butyl phthalate	µg/L	NE	0.96	U
Di-n-octyl phthalate	µg/L	NE	0.96	U
Diethyl phthalate	µg/L	NE	0.96	U
Dimethyl phthalate	µg/L	NE	0.77	U
bis(2-Ethylhexyl)phthalate	µg/L	6	1.1	U
Fluoranthene	µg/L	NE	0.56	U
Fluorene	µg/L	NE	0.73	U
Hexachlorobenzene	µg/L	1	0.66	U
Hexachlorobutadiene	µg/L	NE	0.92	U
Hexachlorocyclopentadiene	µg/L	50	0.76	U
Hexachloroethane	µg/L	NE	0.71	U
Indeno(1,2,3-cd)pyrene	µg/L	NE	0.55	U
Isophorone	µg/L	NE	0.61	U
2-Methylnaphthalene	µg/L	NE	0.66	U
2-Nitroaniline	µg/L	NE	0.72	U
3-Nitroaniline	µg/L	NE	0.62	U
4-Nitroaniline	µg/L	NE	0.93	U
Naphthalene	µg/L	NE	0.61	U
Nitrobenzene	µg/L	NE	0.69	U
N-Nitroso-di-n-propylamine	µg/L	NE	0.82	U
N-Nitrosodiphenylamine	µg/L	NE	0.96	U
Phenanthrene	µg/L	NE	0.68	U
Pyrene	µg/L	NE	0.65	U
Petroleum Hydrocarbons				
Gasoline Range Organics (C6-C10)	mg/L	NE	0.05	U
Diesel Range Organics (C10-C28)	mg/L	NE	**0.115**	J
Oil Range Organics (C28-C40)	mg/L	NE	0.10	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Metals				
Aluminum	µg/L	NE	**36.2**	J
Antimony	µg/L	6	**6.7**	J
Arsenic	µg/L	10	2.5	U
Barium	µg/L	2000	**29.1**	J
Beryllium	µg/L	4	0.50	U
Cadmium	µg/L	5	1.0	U
Calcium	µg/L	NE	**654,000**	
Chromium	µg/L	100	4	U
Cobalt	µg/L	NE	**6.2**	J
Copper	µg/L	1300	**2.9**	J
Iron	µg/L	NE	**97.5**	J
Lead	µg/L	15	2.2	U
Magnesium	µg/L	NE	**310,000**	
Manganese	µg/L	NE	**179**	
Mercury	µg/L	2	0.03	U
Nickel	µg/L	NE	**3.7**	J
Potassium	µg/L	NE	**16,500**	
Selenium	µg/L	50	4.0	U
Silver	µg/L	NE	0.50	U
Sodium	µg/L	NE	**762,000**	
Thallium	µg/L	2	0.078	U
Vanadium	µg/L	NE	**4.5**	J
Zinc	µg/L	NE	**12.8**	J

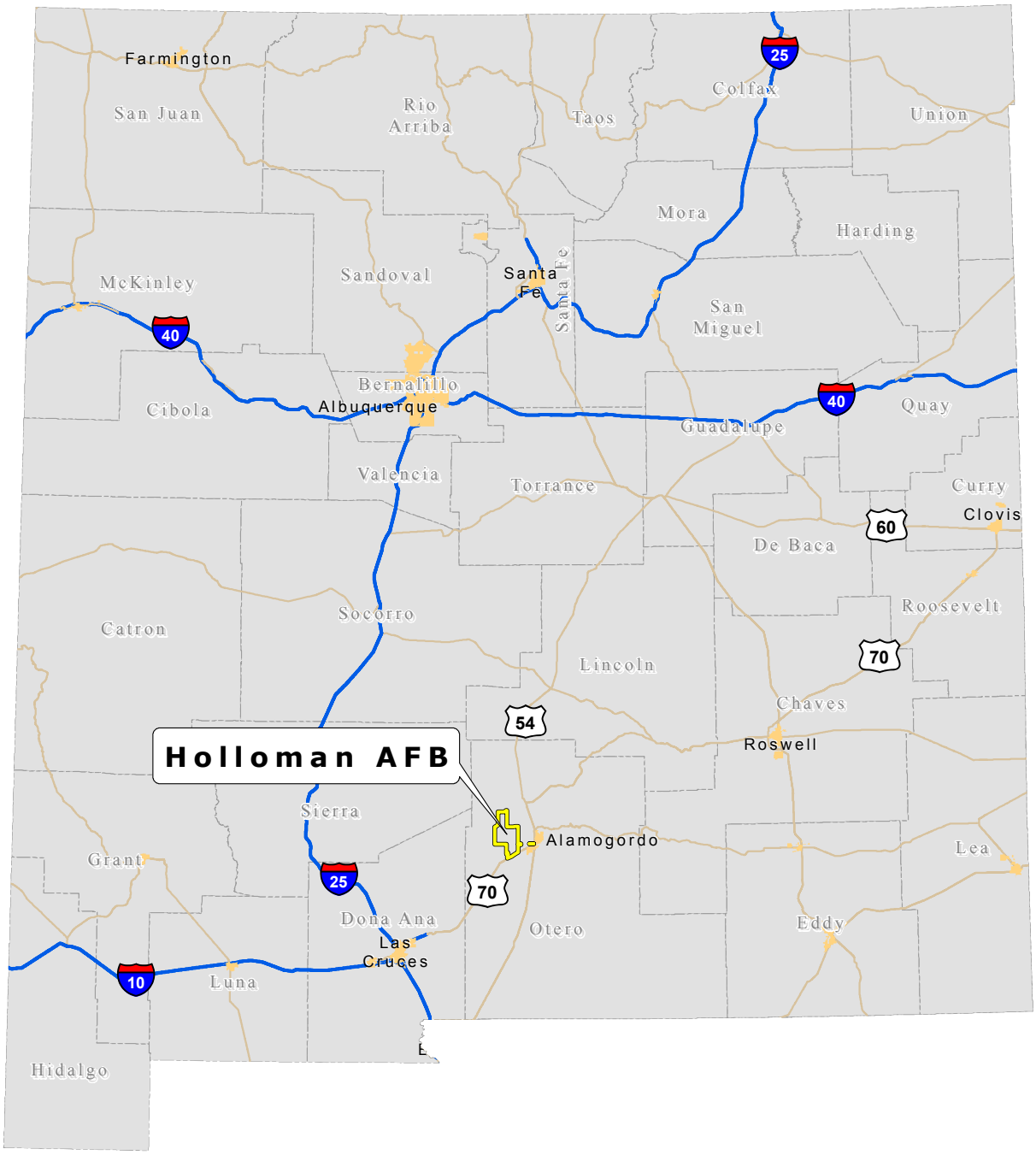
Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

[a] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

EPA = U.S. Environmental Protection Agency.
J = estimated value.
MCL = maximum contaminant level.
µg/L = micrograms per liter.
mg/L = milligrams per liter.
NE = not established
RSL = regional screening level.
U = not detected at the detection limit shown.
VQ = validation qualifier.

Figures



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Date: 8/28/2013

Approved By: BFoss

Checked By: CLong

Drawn By: BGrod

Office: Hou

Legend

Holloman AFB

N

WGS 84 UTM Zone 13N Meters

0 20 40 80
Kilometers

0 10 20 40
Miles

Figure 1-1

Holloman Air Force Base Location

Holloman AFB, New Mexico

Office	Drawn By	Checked By	Approved By	Date	File Path
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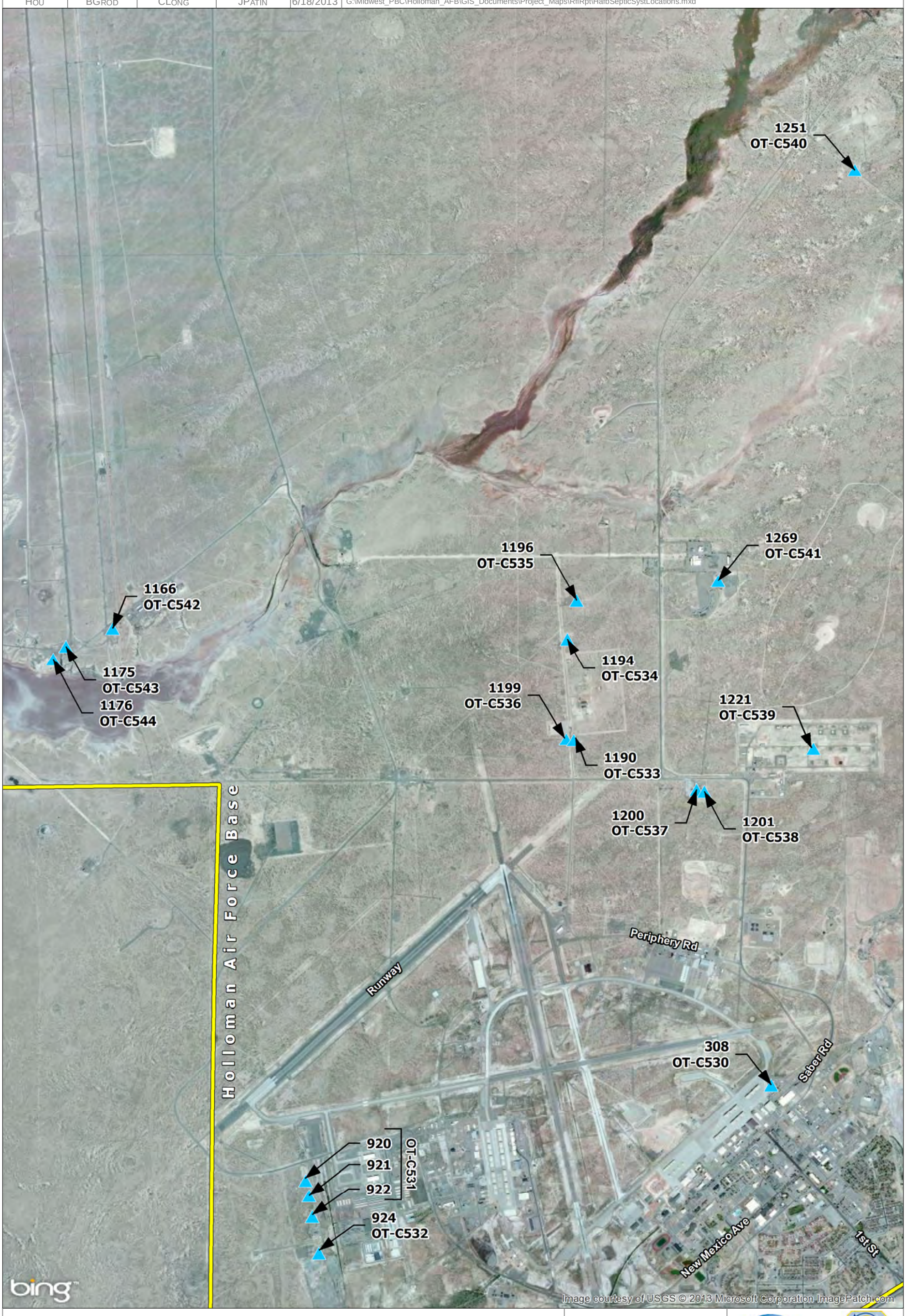


LEGEND

- Holloman AFB
- Septic Tank System

N

WGS 84 UTM Zone 13N
Meters

1 inch = 2,800 feet

0 700 1,400 2,800
Feet

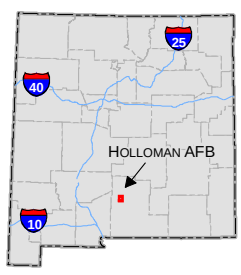
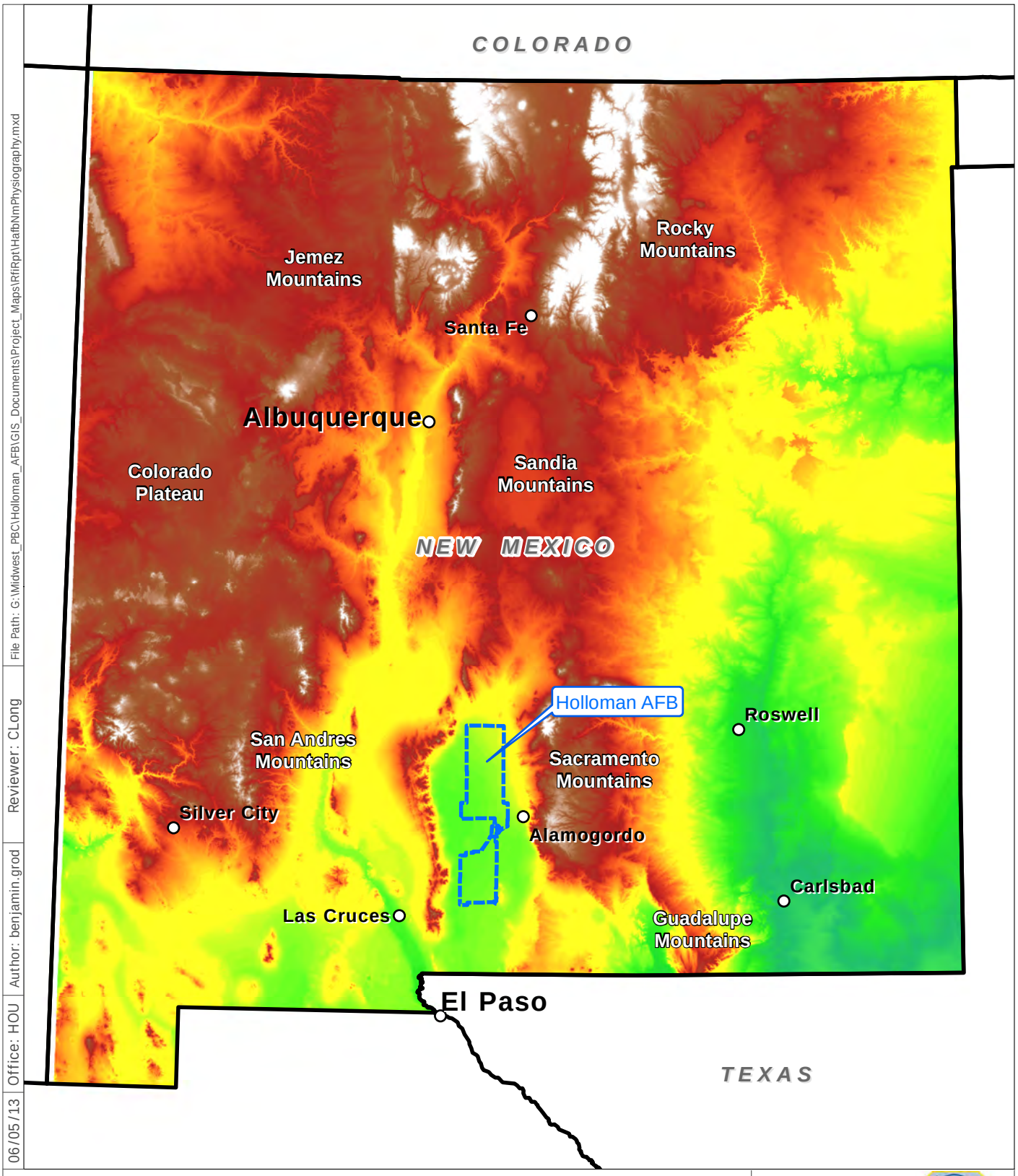


Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
Holloman AFB, NM



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Reviewer: CLong
Author: benjamin.grod
Office: HOU
06/05/13

Legend

Holloman Air Force Base (AFB) Installation Area

Elevation
- High : 3,936 meters
- Low : 0 meters

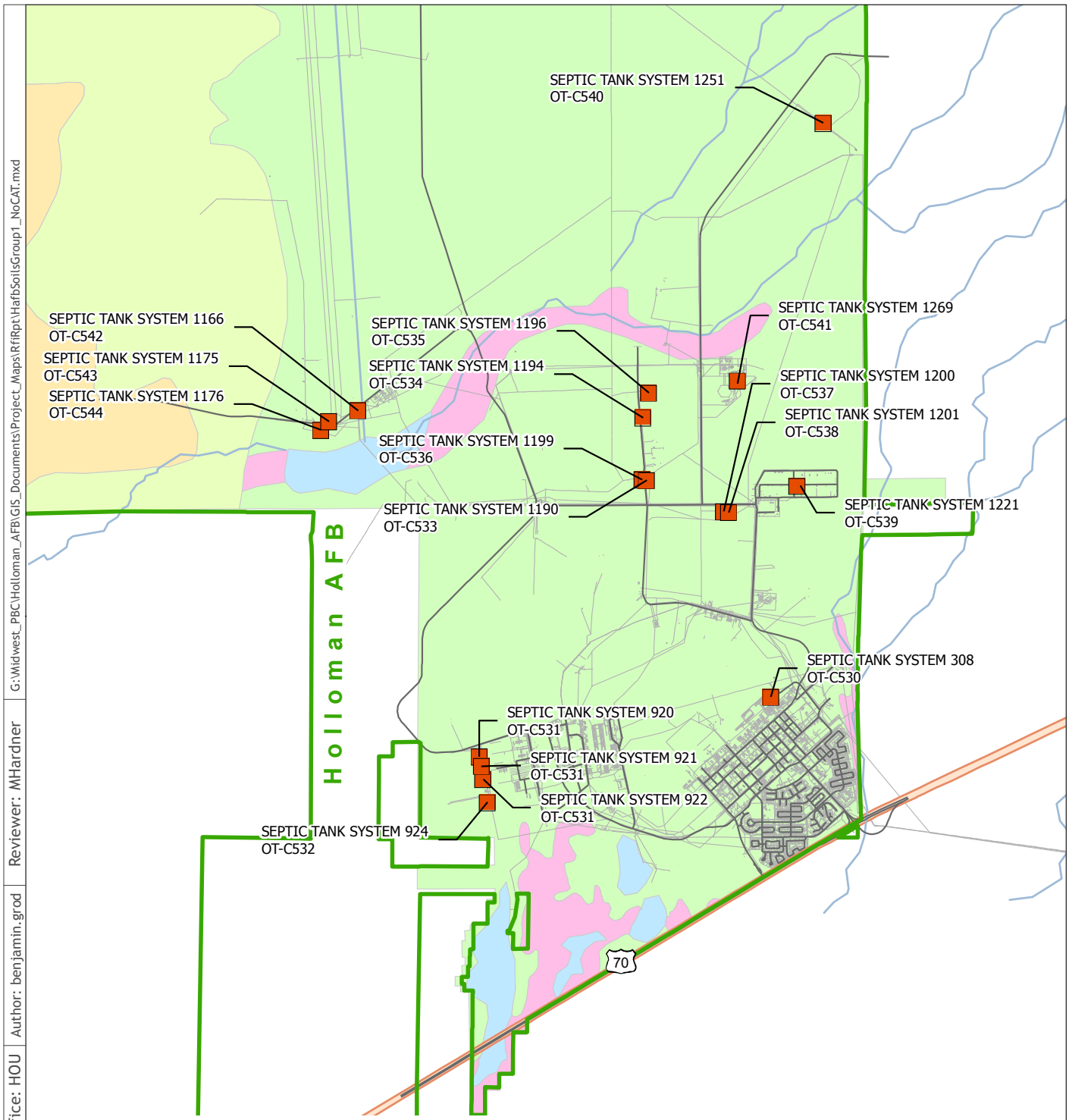
NAD 83 SPCS
New Mexico Central
Feet

0 50
Miles

Figure 2-1

Physiographic Map

Holloman AFB, New Mexico



Note:
1) Soils types at Holloman Air Force Base, New Mexico are based on United States Department of Agriculture (USDA) Soil Conservation Service Classifications. Source USDA, 1981

06/18/13 | Office: HOU | Author: benjamin.grod | Reviewer: MHardner | G:\Widwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbSoilsGroup1_NoCAT.mxd

Legend

- Installation Area
- Group 1 Septic Tank Sites
- Surface Water
- Active Dune Land Gypsum
- Duneland Yesum Association
- Holloman-Gypsum Land-Yesum complex
- Intermittent Water
- Mead Silty Clay Loam
- Rock Land Warm

NAD 83 SPCS
New Mexico Central
Feet

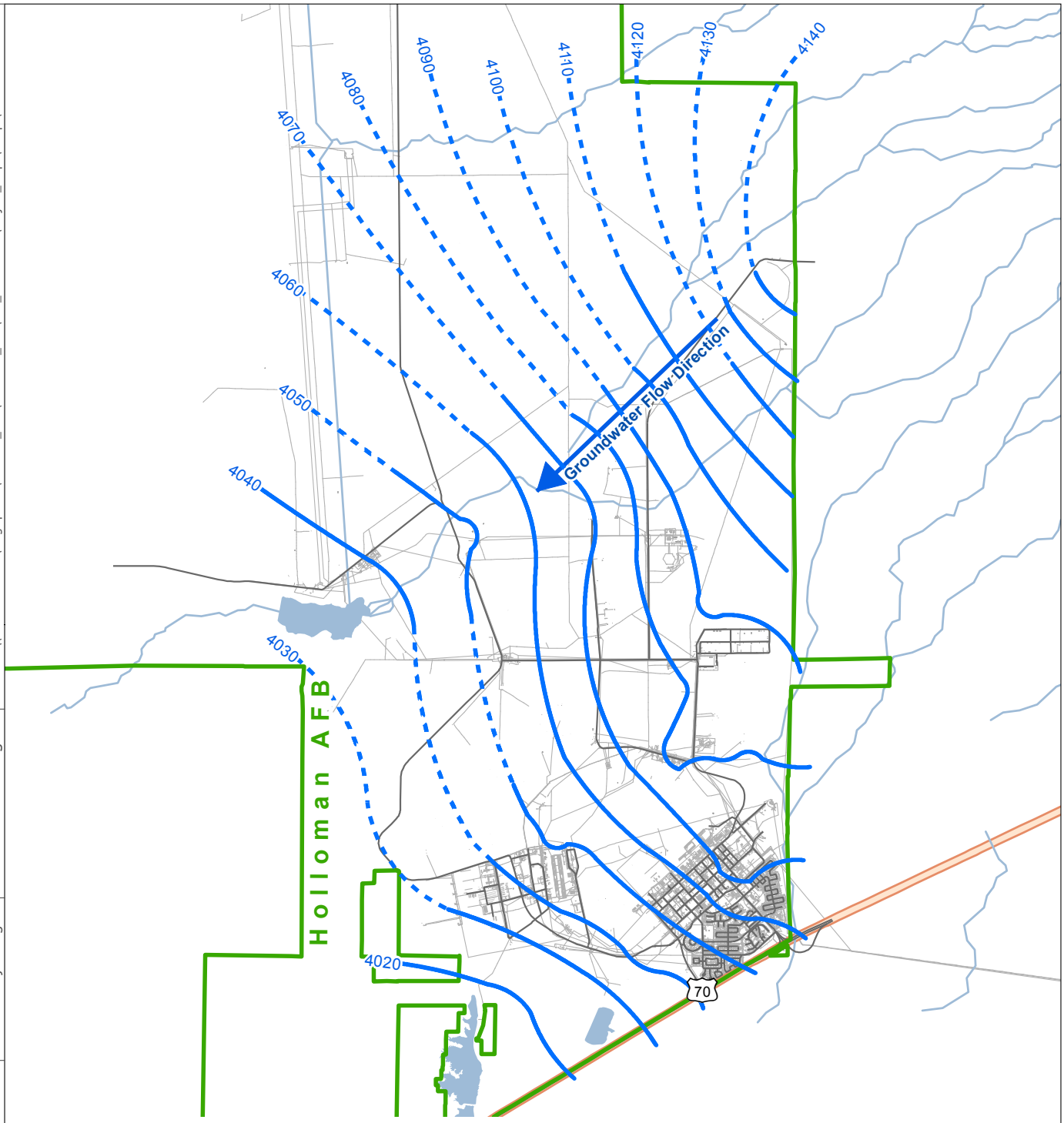
0 7,000
Feet

CBI

Figure 2-2

Septic Systems Soils Map

Holloman AFB, New Mexico



Note:
1) Groundwater contour map showing groundwater elevation contours across Holloman Air Force Base, New Mexico, are based on 2002 measurements taken from the shallow aquifer.
2) Source: Holloman AFB GIS, 2002 LTM.

08/28/13 | Office: HOU | Author: benjamin.grod | Reviewer: CLong | File Path: \\cfsfs01.cfs.com\arcgisprod2\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbGw2002.mxd

Legend

- Installation Area
- Groundwater Flow Direction
- Groundwater Elevation Contour (ft) (Dashed where inferred)
- Surface Water

NAD 83 SPCS
New Mexico Central
Feet

0 8,000
Feet

Figure 2-3

Regional Groundwater Contour Map

Holloman AFB, New Mexico

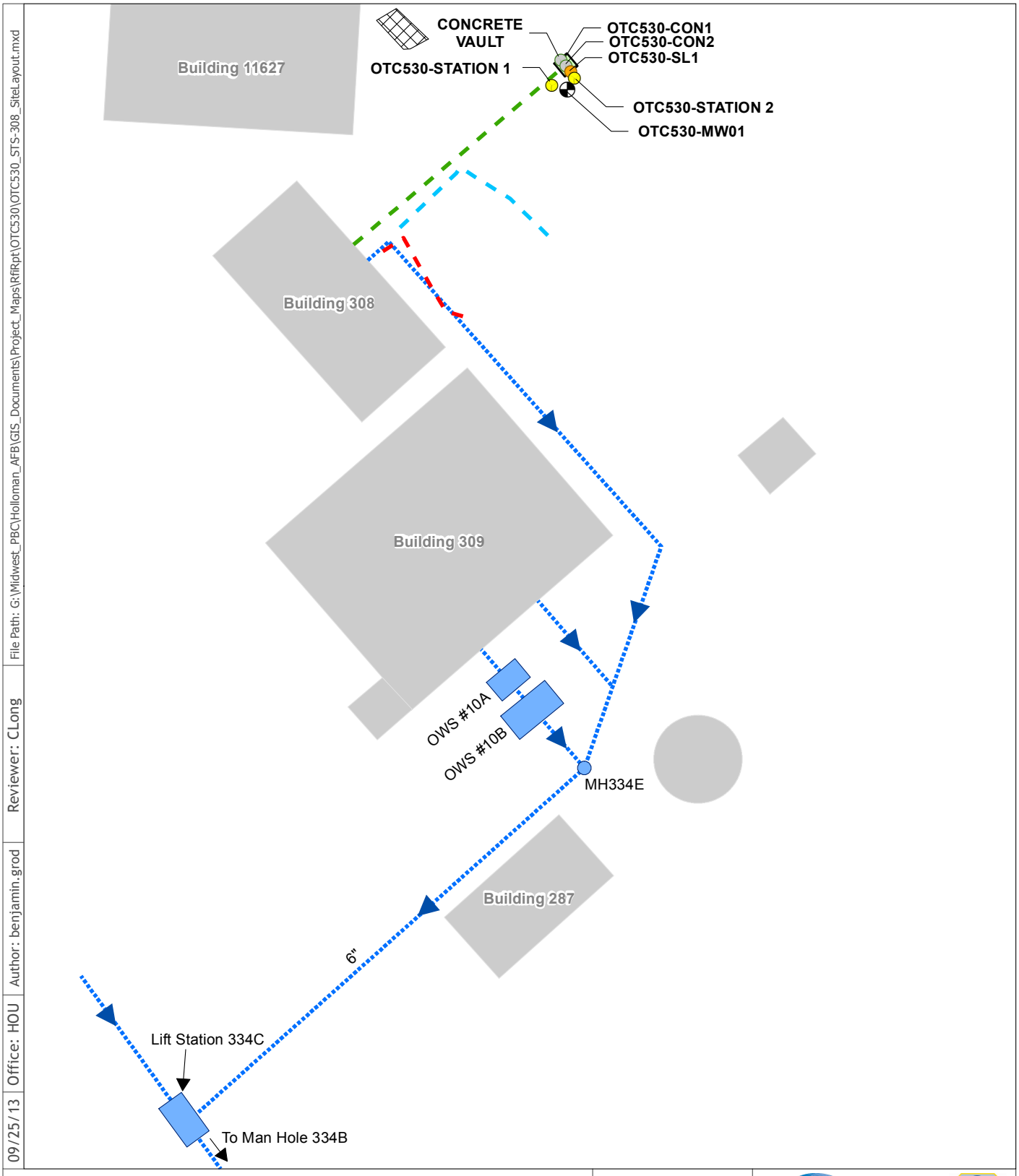


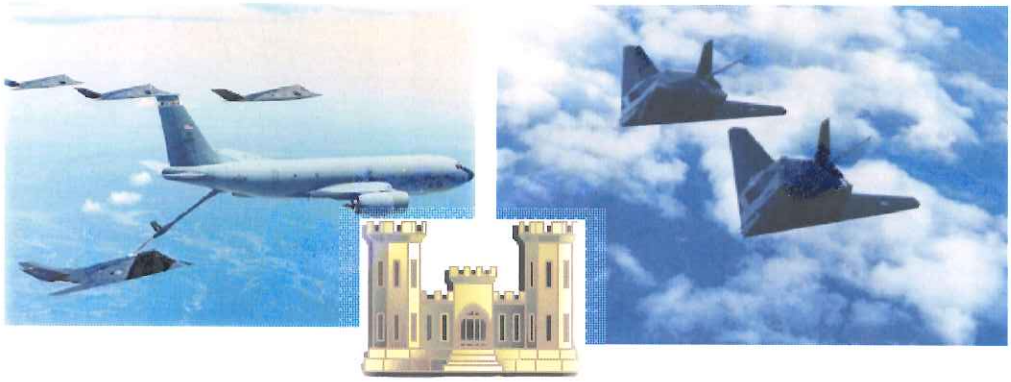
Figure 3-1

Site Layout and
Sampling Locations
Building 308 Concrete Vault
OT-C530

Holloman AFB, New Mexico

Appendix A
Historical Records

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS



Holloman Air Force Base
New Mexico

APRIL 2007

Headquarters, Air Combat Command
Langley Air Force Base, Virginia

49 CES/CEV
Holloman Air Force Base, New Mexico

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH FIGHTER WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

APR 27 2007

MEMORANDUM FOR NEW MEXICO ENVIRONMENT DEPARTMENT
Attn: Mr. James P. Bearzi
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe NM 87505-6303

FROM: 49 CES/CEV
550 Tabosa Ave.
Holloman AFB NM 88330-8458

SUBJECT: Submittal of Information Required by NMED Letter of August 30, 2006
Septic Tanks and Associated Drain Fields, Holloman AFB
EPA ID# NM6572124422

1. Pursuant to Part 4, Condition IV.B.3 of Permit No. NM6572124422, Holloman AFB is submitting the final portion of the required information.

2. This final portion of the required information covers the history of the facilities served by each septic tank and, based on the historic activities that occurred in each facility, the possible wastes that were discharged into the septic systems.

3. If you have any questions or comments, please contact Mr. Dave Griffin or Mr. George Fish at (505) 572-3931.

DEBORAH J. HARTELL
Chief, Environmental Flight

cc: w/Attachments
Mr. Cornelius Amindyas
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

Mr. David Strasser
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS
HISTORY

Holloman's records show a list of fifty seven (57) septic tank systems broken into three categories- Active Septic Systems, Inactive Septic Systems, and Removed Septic Systems. The systems are identified by the Building number they are/were attached to. There are twenty five (25) Active Septic Systems which are listed in this report. There are twenty one (21) Inactive Septic Systems that are listed and the history of activities in the building associated with the system is identified to the extent of available knowledge. There are eleven (11) Removed Septic Systems listed with histories based on available record knowledge.

The Active systems are identified, but no histories of the buildings are provided as this will likely change over time particularly with change in mission (aircraft on base) or tie-in to the base waste water treatment system. A history will be added to this list if and when the septic system is no longer needed and moved to the Inactive or Removed list.

The Inactive systems are scheduled for proper closure per guidance given in the NMED Liquid Waste Regulation 20.7.3.307 NMAC. This regulation calls for capping of the line(s) from the building to the septic tank, pumping out the tanks contents, penetration of the bottom of the tank, along with collapse of the tank roof and filling of the tank with sand or soil.

The septic systems on the Removed list have had the actual septic tank excavated and removed.

A search of Real Property records and the Historic Properties Inventory yielded the information available on the buildings. There was not information available on every building, but if new information becomes available, it will be added to the list.

Attachment 54a-e shows the current plan of where the sewer system lies to show what buildings are currently connected to Holloman's Sewer System. Any building that does not have an active septic tank is either abandoned or connect to Holloman's Sewer System.

ACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	149	1998		1000
2	312	1994		1000
3	375	1968		500
4	882			
5	864 (863)	1994	5'x8'x6'4"	750
6	885	1970	7'10"x4'8"x6'10"	1000
7	886			
8	887	1991		1000
9	923	1959	4'2"x7"x7'9.5"	1600
10	1022	1992		1200
11	1066	1994		1000
12	1160	1957	5'x12'4"x7'6"	1500
13	1161	1957		750
14	1162	1957		350
15	1163	1957		350
16	1169	1962		1680
17	1195	1962		1260
18	1256	1970	12'8"x4'8"x5'	
19	1270			
20	1271			
21	1278	2004		1250
22	1284			
23	1625			
24	75600	1989		1200
25	La Luz Gate (1290)(**1292**)	2004		1250

INACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	308	1965		
2	920	1959	4'2"x7"x7'9.5"	1600
3	921	1959	4'2"x7"x7'9.5"	1600
4	922	1959	4'2"x7"x7'9.5"	1600
5	924	1959	4'2"x7"x7'9.5"	1600
6	1091	1969	6'8"x3'x8'5"	
7	1097	1987	5'10"x5'x7'8"	1672
8	1190	1952	9'x4'x8'10"	3000
9	1194	1987	4'x4'x8'10"	1350
10	1196	1993	4'6"x11'x6'	1300
11	1199	1957		500
12	1200	1954	4'x8'x4'	1000
13	1201	1951	2'6"x6'6"x5'5"	650
14	1219	1985	5'4"x10'6"x8'4"	
15	1221	1983	4'8"x9'4"x6'2"	1100
16	1226	1985	5'6'2"x6'	
17	1235	1986		1189
18	1239	1977	4'6"x8'6"x6'	750
19	1250	1957		350
20	1251			
21	1269	1966	4'6"x9'	500

INACTIVE SEPTIC SYSTEMS

BUILDING 308

This is a 3200 SF building originally constructed in 1965. The original operation in the building was calibration of guided weapons for aircraft. In the 1970s and early 1980s the building was used as a nosedock for F-4 - Test Aircraft Radar electronic work area. It has never had a floor drain.
This facility is currently being used to store air craft support equipment for Building 309. The shop has been used in the past for servicing, inspecting, and repairing AGE equipment, but due to the reduction in personnel, this work is currently only performed in Building 309. The need to expand the work area for AGE equipment maintenance into Building 308 in the near future is not anticipated. A current view of the building is shown below in Figure 1.

Figure 1: Picture of Bldg. 308

Facilities associated with the septic system consist of:

- Toilet
- Lavatory
- Janitorial Sink

The building is located at 340 Delaware Ave. The point of contact for this building is Ms. Vicky Cruz and Mr. Adam Ferrara, they can be reached at 575-~~475~~-5272. The hours

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of operation for this building when it is in use is one 8.5 hr shift (0630-1500) and one 9 hr shift (1500-2400), five days per week.

Industrial Wastewater Drainage: There are no floor or trench drains in this facility. A janitor's sink is located in the restroom. The sanitary sewer pipe from the restroom connects with the pipe from the restrooms in Building in 309. The effluent pipe then proceeds south to Manhole 334E the layout of this facility can be seen below in **Figure 2**. At the time of the inspection surveyors were unable to open Manhole 334E. No cross-connections to the storm sewer were identified.

Industrial Wastewater Sources/Existing Pretreatment/ Existing Management Practices: There is only once source of industrial wastewater from this facility: floor washing

Floor Washing: The floor in this facility is washed every three months using a Tennant floor scrubber, 10 gallons of water and Simple Green. Average and maximum daily wastewater flows from this activity are estimated to be less than one gallon and ten gallons, respectively. The wastewater from this activity is discharged into the French drain at Building 309; therefore, the quantity of wastewater generated by this activity is included in the flow summary for Building 309.

Existing management practices consist of sweeping the floor prior to washing it.

Site Description: Aircraft Corrosion Control
Site Specific Contingency Action Plan: See Attachment 1
Secondary Containment Routes: None
Probable Spill Route: Leaks dissipate in local area on ground
Material Compatibility: No material incompatibilities

Connected to Sewer?

Stored Substances:

Chemical	Container Type
MEK	1 gallon can
Polyurethane Paint	1 gallon can
Naptha	1 gallon can
Toluene	1 gallon can
Epoxy Primer	1 gallon can
PD-680 Type II	55 gallon drum
Waste Paint/Thinners	55 gallon drum

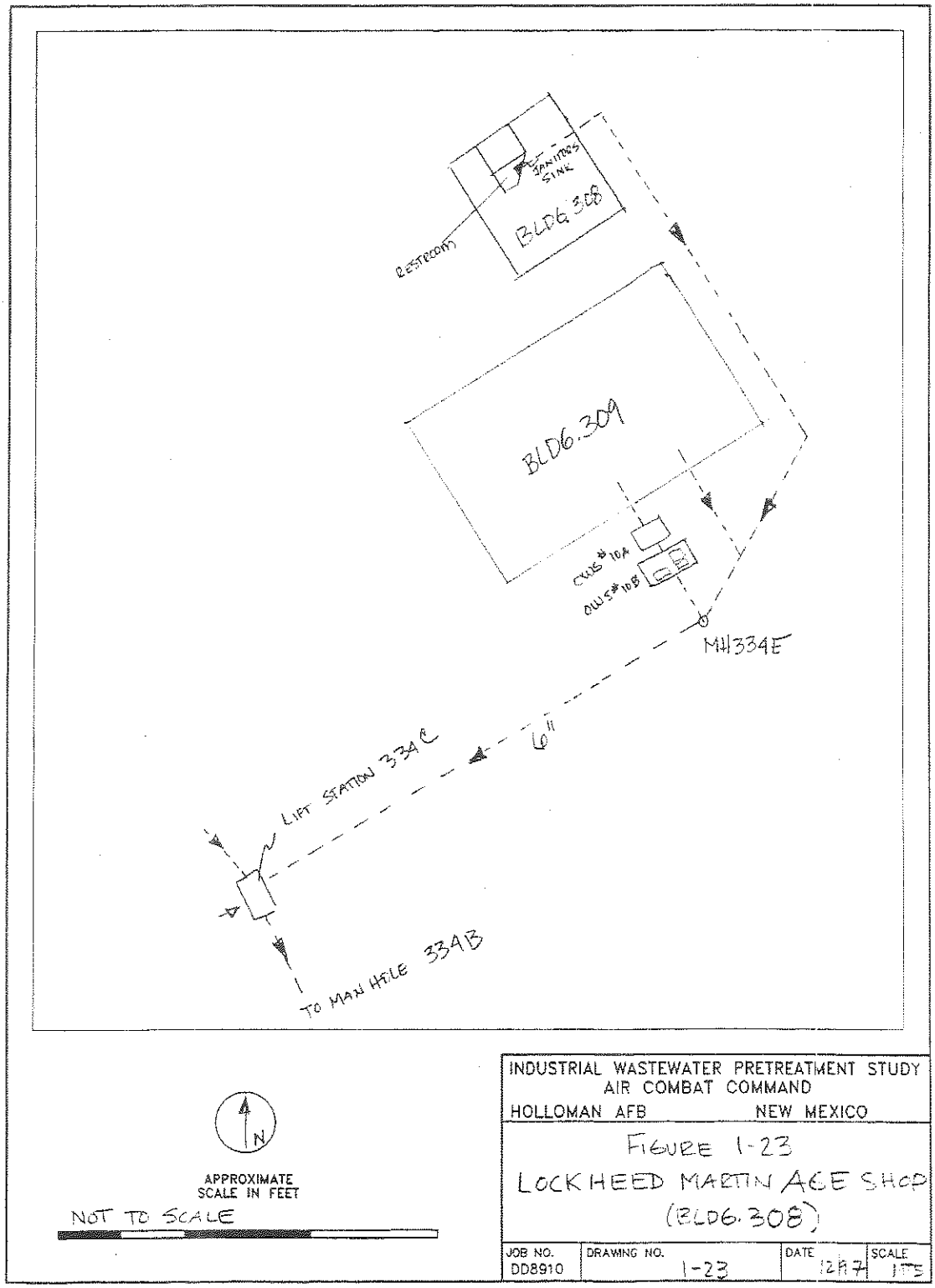

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Figure 2: Layout of Bldg. 308 and 309

INACTIVE SEPTIC SYSTEMS

BUILDINGS 920, 921, 922

These are three identical buildings constructed in 1959. Each building has 1900 SF. They were originally built for ammunition assembly which primarily consisted of bolting rocket components together prior to use. All three buildings are presently vacant and empty.
Each of the three buildings has a simple bathroom consisting of a:

- Toilet
- Lavatory

Multiple inspections were set up for this site, but no one showed up. Therefore, no follow-up information was found. Pictures of the current buildings are shown below in Figures 3-5.

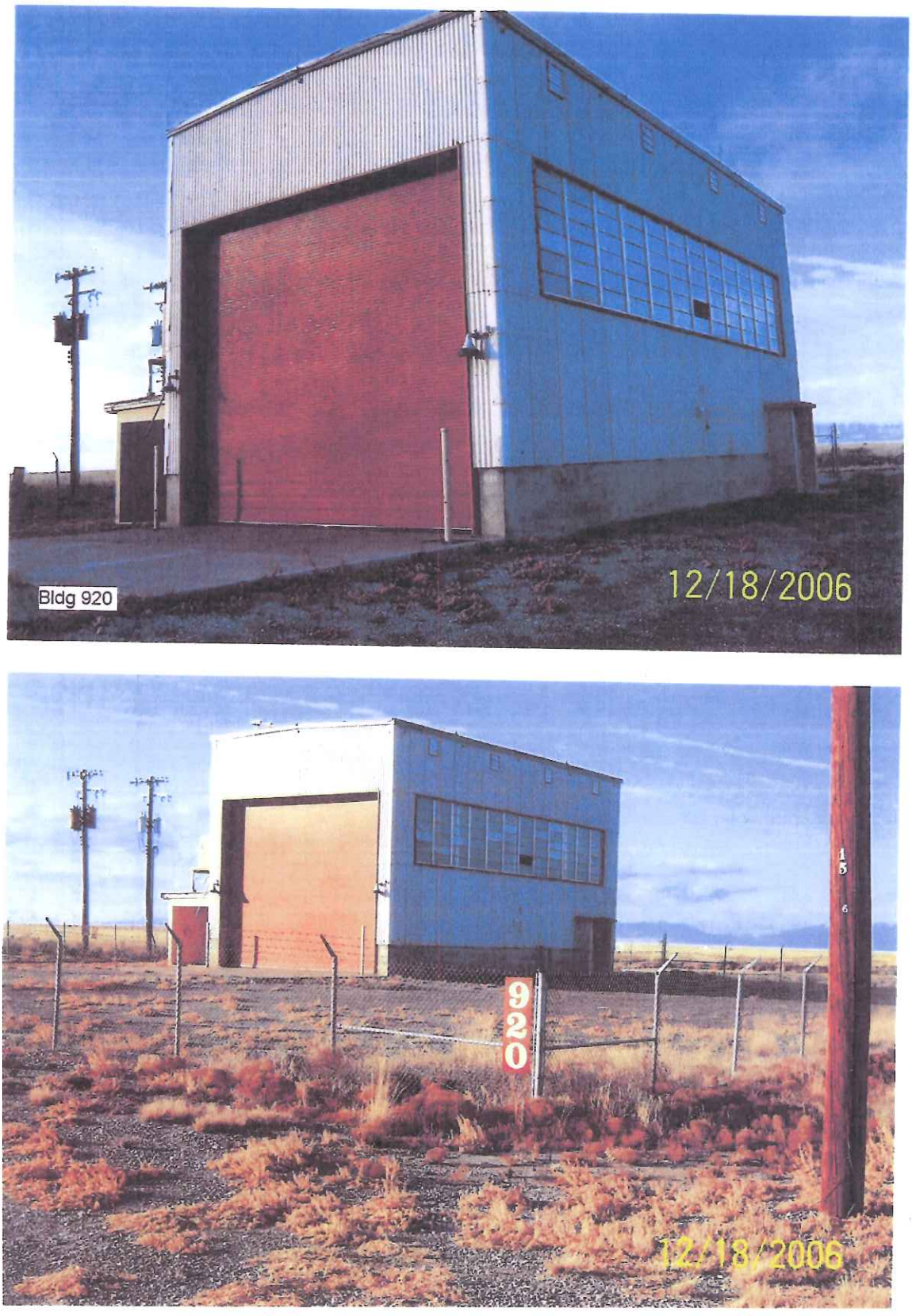


Figure 3: Pictures of Bldg. 920

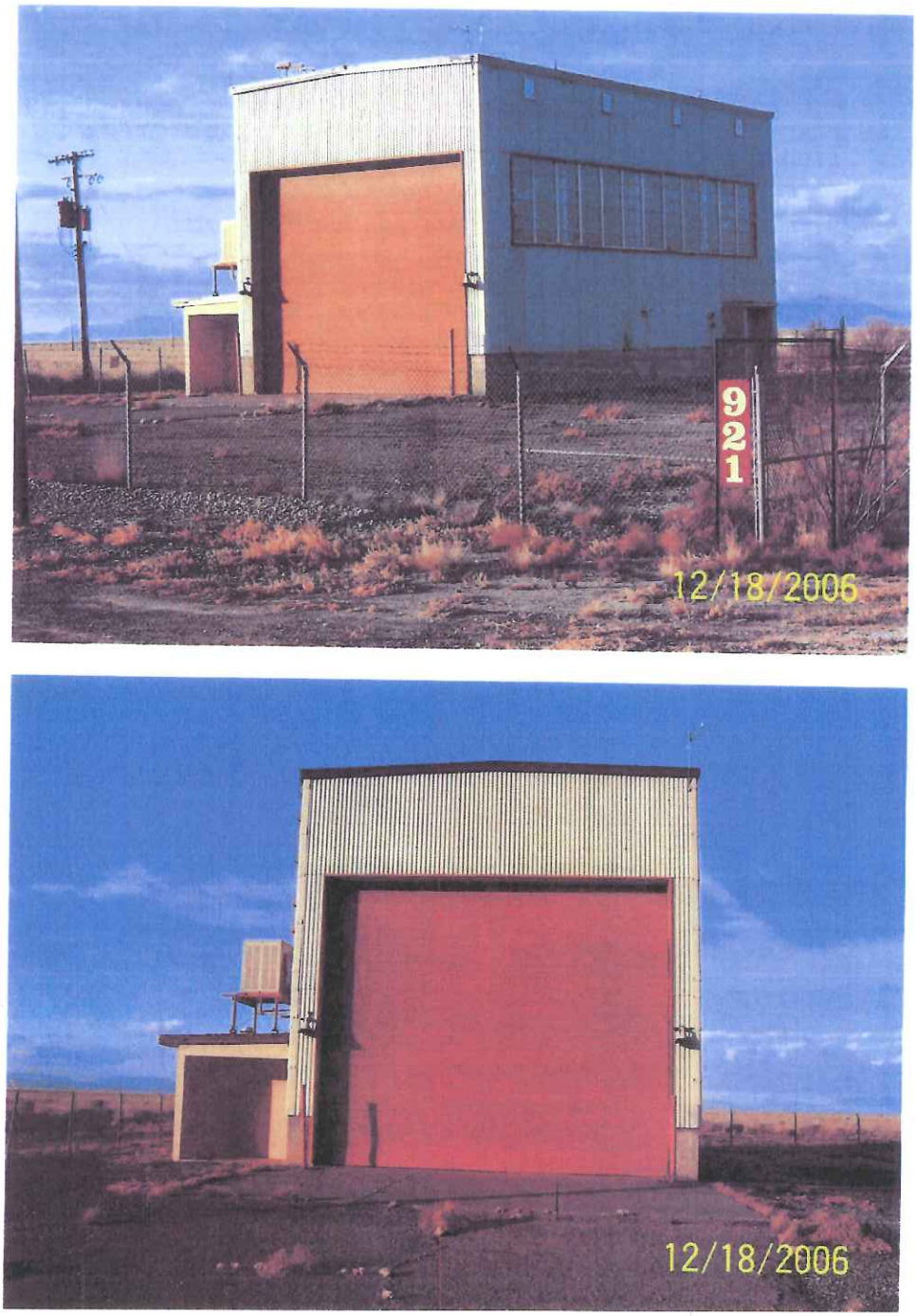


Figure 4: Pictures of Bldg. 921

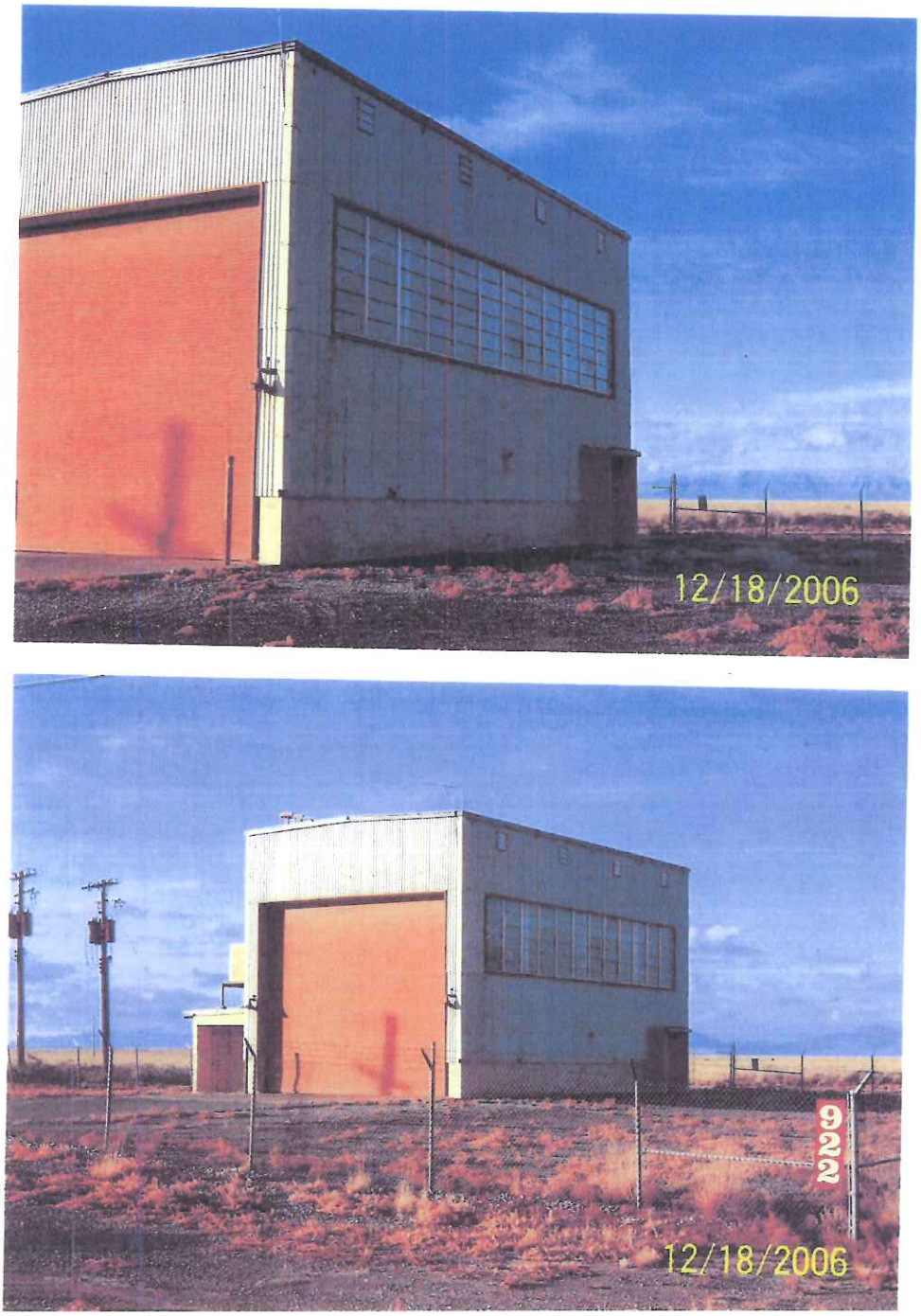


Figure 5: Pictures of Bldg. 922

INACTIVE SEPTIC SYSTEMS

BUILDING 924

This building was constructed in 1959 and has 4800 SF.
The building's original service was ammunition assembly similar to buildings 920-922.
It was later used for maintenance of radar tracking equipment.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

An on site inspection was done for this building on 20 Dec 2007 with the current facility manager, Mr. Michael Tackett. He did not have any information about the history of the septic tank system. Currently the building is being used for munitions storage. For the past two year it has stored rocket motors for the test track. From the on site inspection and drawings (Attachment 4-6) it can be seen that the bathroom drain is separate and there are no floor drains.

There are no pictures on file of this building.

INACTIVE SEPTIC SYSTEMS

BUILDING 1091

Site Description: There are no current files on this building because the building has been demolished. The building served as the Airfield Control Tower until replaced by the present Control Tower
On Attachment 55b a drawing of where the leach field was located in 1984 can be seen.
Grid Coordinates: J.9, 10.2
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: No secondary containment associated with underground storage tank
Probable Spill Route: Leakage from underground tank will contaminate water table in local vicinity

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 / UST

There were also three drawings that were discovered during the research stage of the project. The drawing (Attachment 7) shows the Septic Tank Details, Septic Tank Drain Field and the Drain Field Details.

INACTIVE SEPTIC SYSTEMS

BUILDING 1097

Specifications and history of this building are given in the following "Cold War Survey: Holloman Air Force Base". Along with this survey an on site inspection was done on 28 November 2007 with the current facility managers, A1C Clinton Bennett and TSgt Robert Edyburn. During the on site inspection it was discovered that the bathroom is separated from work area drains. In the past the building was used as a communications work center (office space) until 2005. There are no floor drains in the work area. It is currently being used as a houses base for a radio system network. There were also three drawings (Attachment 8-10) that were discovered in the investigation phase of the project. The drawings show the Materials Septic System, the Septic Tank Placement and Piping, the Latrine Plan, and the Mechanical Plumbing Plan.

Facilities in this building consist of:

- Toilet
- Urinal
- Lavatory

Description: Communications facility
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: None
Probable Spill Route: Leaks dissipate in local area on ground

Tank Location: South of facility
Fuel Flow – South/West

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 /AST
	500 gal each/ 1 /UST (Abandoned)

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Communications, Receiver.
Historic: Transmitter/Receiver.
Street Address: 1432 Sabre Road, HAFB, 88330-7842.

Building Number: 1097

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [ ] Minor [ ] Moderate [x] Major

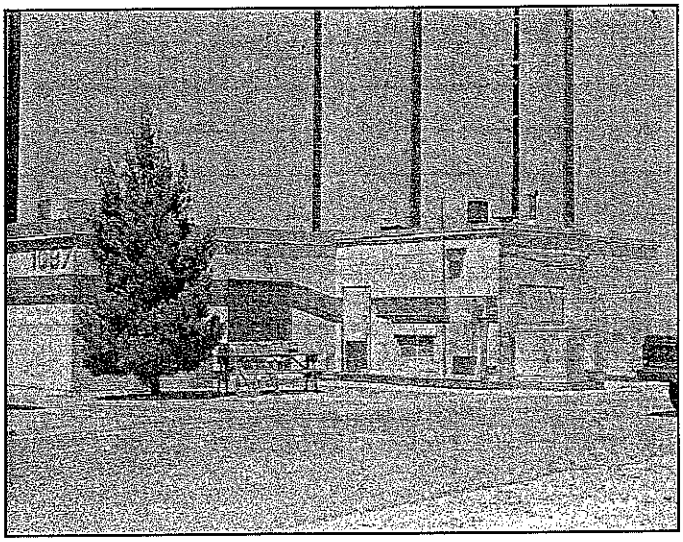
Comments:

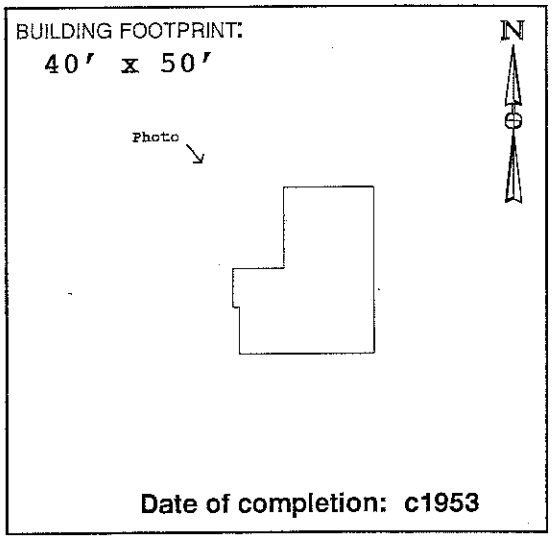
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1097 has not retained historic integrity.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1953

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1097 is a small transmitter building designed with few embellishments for utilitarian use only. Building 1097 originally had a rectangular footprint identical to Building 1098 and Building 1095. The original floor plan was sectioned into 4 rooms. An addition was constructed at the west elevation in 1986 using compatible structural and architectural components (CE File #1097-1). Both the builder and the architect are unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1097.

Current Function: Receiver/Air Traffic Control/Radio Control.

Original Function: Transmitter/Receiving/Communications.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1098-1 (c1952).

Foundation: Concrete wall footing. Concrete slab on granular fill.

Exterior walls: Painted concrete masonary units (CMU).

Roof: BUR on 2" rigid insul.; 2" poured gypsum on gyp board sup. by steel joists.

Notable interior features, including machinery:
Construction drawings document *"UHF Radio Air/Ground Facilities AN/GRC-27"*.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:
Continues to function as a communications facility/receiver site.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1097 has served as a Base communications facility since its completion c1953. Several renovations have resulted in a loss of historic integrity for this building. Building 1097 is no longer eligible for the National Register of Historic Places.

VII. ASSOCIATED BUILDINGS:

Location plan CE File #1098-2 identifies at least three north area transmitter sites. Building 1097 was associated with transmitter Building 1098. This facility is also associated with the flightline, and with communications Building 221.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building #1097 retains its original function as a radio receiver facility, however it has been modified to accommodate electrical, mechanical, and equipment additions and change-outs. Original equipment has been replaced.

Office space was added to the south elevation (1986: CE File #1097-1). All six windows at the north, east and west elevations have been blocked in. Original doors have been replaced. Vinyl floor tile covers original tile throughout. Dropped ceilings have been added.

This building, although retaining historic significance as a receiving site, has lost integrity of design, materials, workmanship, and association with its period of significance. Note: A Sgt. Boots (extension 3132) was identified by Building 1097 personnel as being a possible source for oral history research concerning specific activities associated with this facility.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Office space added to the west elevation (c1986: CE File #1097-1).

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Construction of adjacent buildings has altered viewshed.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Windows have been blocked in.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: An addition obscures the original west elevation. The original window treatments removed. Dropped ceilings added. Original asphalt floor tile covered.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: The presence of interior communications equipment and exterior poles contribute to the integrity of feeling as a radio site.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

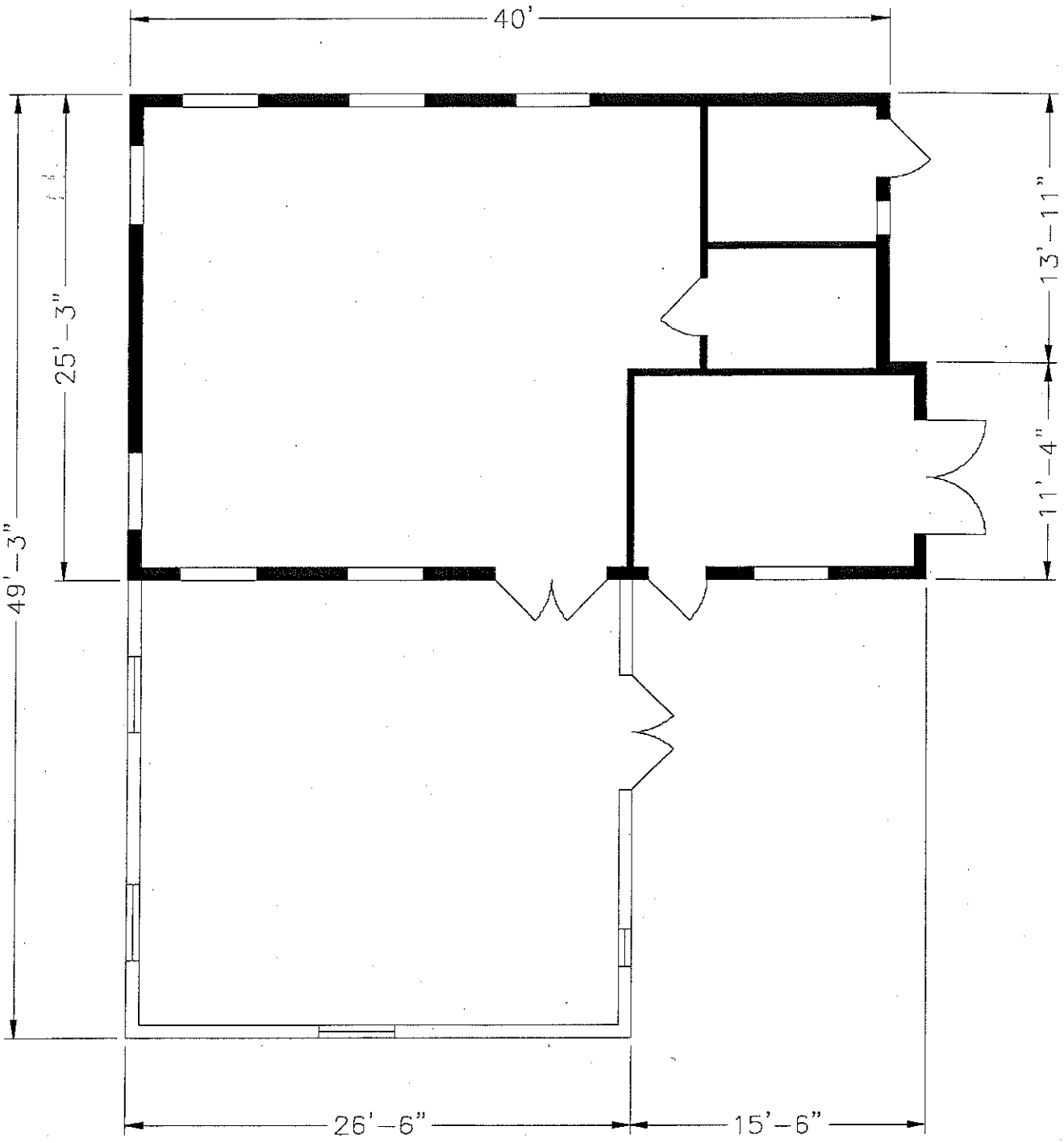
Comments: Original equipment has all been replaced.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #81**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



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Source: CE File #1098-2 (c1971)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1097** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1190

This building was constructed in 1952 and demolished in 2002. Specifications and history are provided in the "Cold War Survey".

The only drawing discovered was the plumbing floor plan and it can be seen in Attachment 11. Attachment 55d shows the current location of the leach field in 1984.

2002 Demolished Due To Unrelated Condition

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Security Police Building.
Historic: Change House/Unconventional Fuel Storage.
Street Address: 1514 Lethal Road, HAFB, 88330-7840.

Building Number: 1190

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1190 is in need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

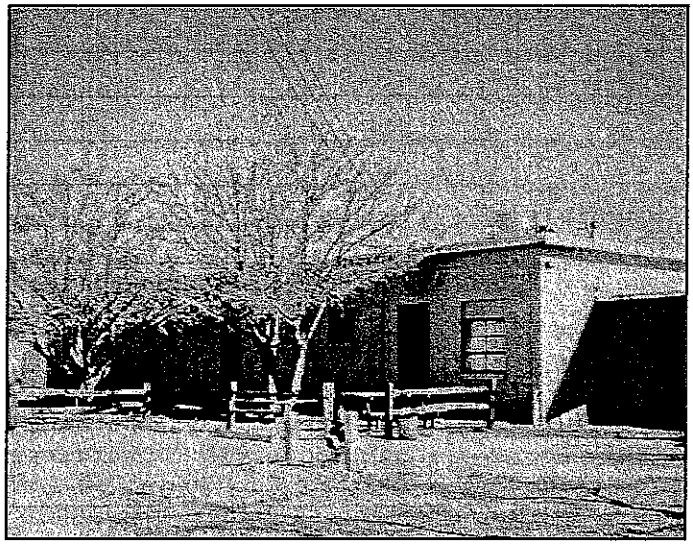
Comments: Interior partitions have been removed (date unknown).

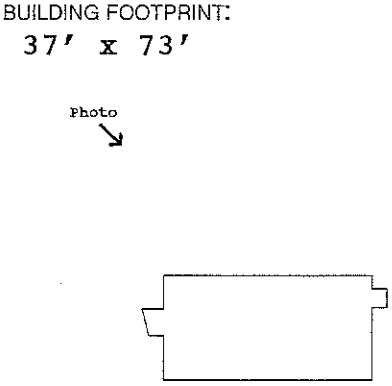
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1190 is a single-story, flat-roofed, concrete masonry unit (CMU) building exhibiting large roll-up equipment doors, numerous personnel access doors, and asymmetrical window fenestration. Construction drawings prepared in 1951 were stamped "As-built" but were not stamped in the revision block. Real Property Accountable Record/1190 indicates that Building 1190 was completed c1952 as a Change House for unconventional fuels personnel. W. C. Kruger Company (Santa Fe, NM) provided the construction drawings stored in CE File #1190. The builder is not known. A comparison of the current building and original blueprints reveals that no structural modifications to the building have occurred.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1190; CE File 1195-1 (c1951).

Current Function: Security Police operations.

Original Function: Change House, Unconventional Fuels.

Interim Functions: "RC Con House" (n.d.); "Prpln R-L Fuel/Lub" (n.d.); Prop Res Lab Rocket" (n.d.); "Prpln R-L Rkt" (n.d.); Sp Operations (n.d.).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1190-1 (c1951).

Foundation: Poured concrete footings and grade beams; concrete slab.

Exterior walls: Concrete masonry units (CMU).

Roof: (Built-up) gravel on rigid insul.; 2" slab sup. by metal lath and steel joists.

Notable interior features, including machinery: Shower stalls, locker room, dressing room, and laboratories.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

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VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Recommend reassessment of Building 1190 once the fifty-year construction date is met in the year 2002. This building retains historic integrity.

VII. ASSOCIATED BUILDINGS:

According to CE File #1190-1 *Title Sheet*, Unconventional Fuels Storage Building 1190 was associated with Building 1194 (Booster Inspection), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

This building retains all aspects of historic integrity. Although not meeting the "exceptional importance" standard imposed on buildings constructed within the last fifty years, Building 1190 remains potentially eligible as an individual property once the fifty-year date of construction is met in the year 2002. Recommend inclusion in a Multiple Property nomination along with the other unconventional fuels storage buildings. Building 1190 is currently being used as a storage and administrative facility by the 49th Squadron Security Police personnel. The original shower stalls, dressing room, locker room, shop, tools and supply rooms are all used for storage. Free-standing shelves have been installed to accommodate storage. As a result, some original doors and windows are blocked from view. Minor alterations have occurred at the interior. Two partitions have been removed. Glazed tile walls appear to have been added to at least one office. Vinyl tile has been installed over one section of the concrete slab in what once served as a machine shop. Some of the window panes have been painted. Because this facility remains potentially eligible, recommend that the original design features be considered in future modifications, and that photographs document any changes to the essential features. Suggested routine maintenance: Prune trees away from principal facade. Noticeable water damage warrants inspection of the roof. Replace broken window panes. Repair hole at exterior south elevation wall.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: Interior room layout as a Change House remains a key design element. This layout includes large open interior spaces, smaller labs/offices, and showers, dressing, and locker rooms used by unconventional fuels personnel.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Although no longer used as such, Building 1190 continues to be situated in the vicinity of other buildings historically associated with unconventional fuels testing and storage. This building appears to been recently landscaped.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two interior partitions removed. Glazed tile walls in office rather than CMU shown on original drawings.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Nearly all original workmanship remains visible, particularly at exterior.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Aside from the change in operations occurring here, Building 1190 remains essentially as it was originally constructed.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

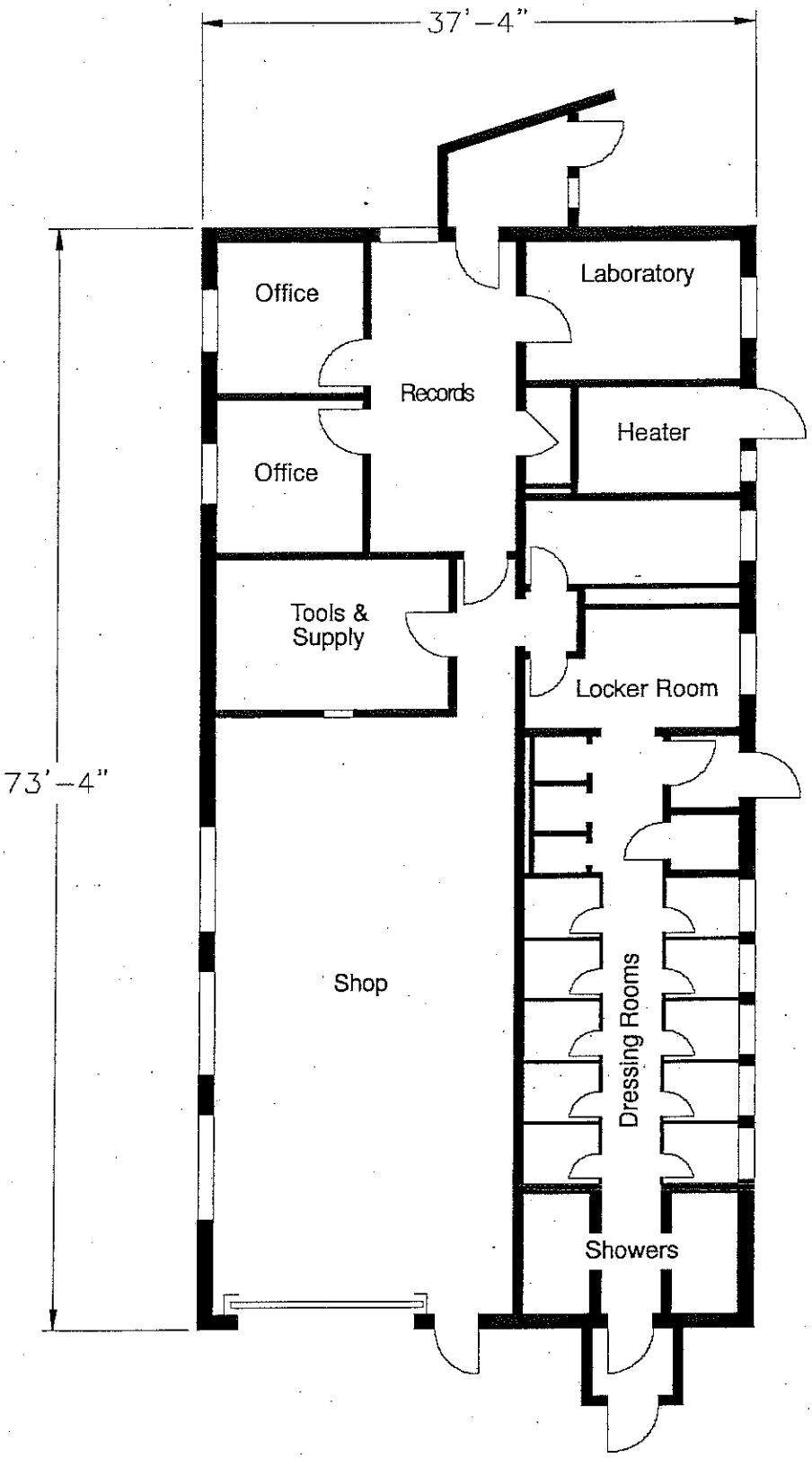
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #-Photo #**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1190-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1190** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Mike Gardner* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1194

Specifications and history are given in the "Cold War Survey".
Facilities in this building consist of:

- Toilet
- Lavatory

An on site inspection was done on 7 Jan 08 with the current facility manager, SSgt Joshua Roberts. In the inspection it was noted that the bathroom is separated from the work area drain. There was no history known. The building is currently being used for storage and it has been used for storage and has been used for storage for the past ten years.
Attachment 55d shows where the leach field for Bldg.1194 was located in 1984.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME: **Building Number:**

Current: Research Equipment Storage.

Historic: Booster Inspection/Unconventional Fuel.

Street Address: 1584 Lethal Rd., HAFB, 88330-7840. **1194**

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1194 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

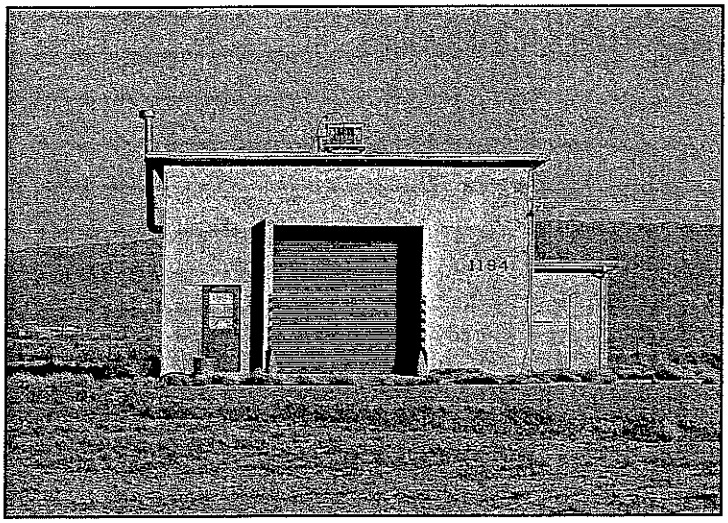
Comments: Interior partitioning is reversible.

Preliminary Determination of National or State Register Eligibility:

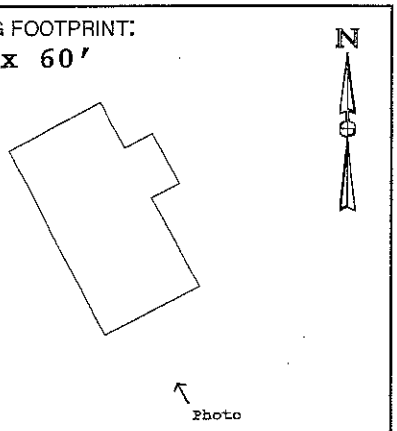
[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.



BUILDING FOOTPRINT:
30' x 60'



Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1194 is a rectangular, single-story, high bay structure made of concrete masonry units (CMU) and exhibiting a flat roof. The principal elevation faces west, showing one large roll-up door, and one personnel door. One row of windows is located below the eave line at the north and south elevations. The ceiling at the interior is exposed. "As-built" construction drawings show that Building 1194 was completed in 1952. W. C. Kruger Co. (Santa Fe, NM) provided the architectural work (1952: CE File 1194). The builder is unknown. No structural modifications to the original structure were noted.

III. HISTORIC AND CURRENT USE:

Current Function: Research equipment storage.

Original Function: Missile Assembly Test Building/Booster Inspection.

Interim Functions: "Mls/Space Rsch Tst" (n.d.); "M/Assembly Test Bldg" (n.d.); "Shp Wpn and Rlse Sys" (c1976); "BE Stor Cv Fclty" (n.d.); "Rsch Equip Stor" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1195-1 (c1952).

Foundation: Poured concrete footings and stem wall. Slab on compacted fill.

Exterior walls: CMU between concrete columns and bond beams.

Roof: BUR gravel. Rigid insulation. 2" concrete deck supported by steel joists.

Notable interior features, including machinery:

4-ton Wright Company chain-operated crane and hoist system, hoist no. 5197, serial no. 4925. The hoist is attached to a runway "I"-beam (crane) supported by steel support beams. Large metal roll-up doors at east and west elevations.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

210

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1194, although not meeting the "exceptional importance" standard, may be eligible for the National Register for its role in early Cold War materiel development once the fifty-year construction date is met in 2002.

VII. ASSOCIATED BUILDINGS:

According to CE File #1195-1 (c1951) *Title Sheet*, Building 1194 was associated with Building 1190 (Change House), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1194 remains essentially as it was constructed c1952. The original floor plan layout included one main room and an equipment room. A small area in the northwest corner of the main room has been partitioned. No documentation was found pertaining to this modification. This minor partitioning of the main room is reversible. This building is no longer associated with either missile assembly and test activities or unconventional fuels storage, and currently serves as an equipment storage room for the 6585th Test Group. Construction drawings (1956: CE File # 1194-1) show that an addition to this building was planned. There is no indication that this addition was ever built. Because this building retains historic integrity, and may be eligible for the National Register under Criteria A and/or C once the 50-year construction date is reached in the year 2002, recommend that future modifications take essential design features into account. Note: One isolated occurrence of prehistoric artifacts was noted on the grounds north of the building, including one white chert core, and one secondary chert flake.

Suggested routine maintenance: Scrape, prime, and paint the exterior. Replace downspouts. Prune landscape plantings away from foundation.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Construction drawings show plans for an addition to the north elevation (1956: CE File #1194-1). There is no evidence that this addition was ever built.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The high open-bay floor plan allowing the crane and hoist system, and the large metal equipment roll-up doors remain as key design elements.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Buildings 1193 and 1194 remain in an unmodified and isolated setting.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Nearly all of the historic materials used to construct this building remain visible.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two doors have been replaced. All windows appear to be original. Interior partitions at the northwest corner divide the original floor plan.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Although retaining its original open floor plan, this building is currently used for storage of modern equipment.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

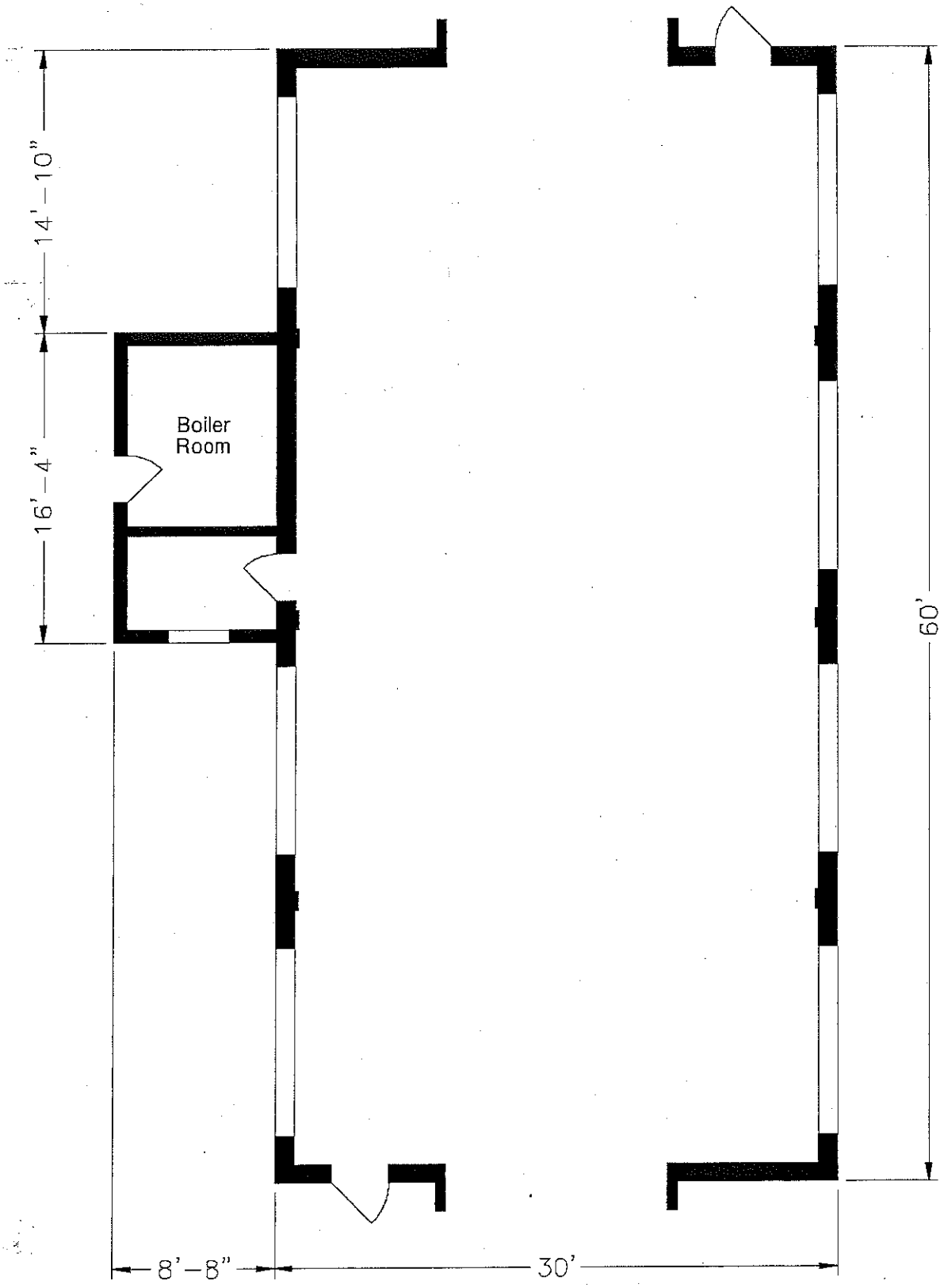
Comments: The open floor plan, isolated setting, hoist system, and nearby continuity check stand (Building 1193) contribute to this building's integrity of association.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #3-Photo #31**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1195-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1194** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1196

This building was constructed in 1956. It originally built for missile assembly, but is now in communications equipment storage.
The original facilities consisted of:

- Toilet
- Lavatory

These facilities were replaced in 1975 with:

- Toilet
- Urinal
- Lavatory

An on site inspection for this building was done on 4 Dec 07 with the current facility manager Sgt Lander. The information gathered from this inspection was that there were not any floor drains located within the building. In the past it was used for TAC can and for the past ten years it has been used for storage.
Attachment 55d shows where the leach field for Bldg. 1196 was located in 1984.

Figure 6: Picture of Bldg. 1196

INACTIVE SEPTIC SYSTEMS

BUILDING 1199

This building was constructed in 1957. It was originally built as a rocket fuel laboratory. In 1987 it was converted to the Security Forces Kennel.
As the fuels laboratory, it contained:

- Toilet
- Urinal
- Lavatory
- Shower

After conversion to the kennel, the facilities were changed to:

- Toilet
- Urinal
- Stainless Steel Sink

During the investigation stage of the project there were drawings found for building 1199. Attachment 12 and 13 are of the Site Plan, the Sewer Isometric, the Plumbing Plan and the Floor Plan.

Along with the drawings that were found an on site inspection was completed on 29 Nov 07 with the current facility manager, SSgt Gilmore. A new Security Forces Kennel area has been built and now the building is currently being used to house animals until they can be transferred to Alamogordo Animal Control.

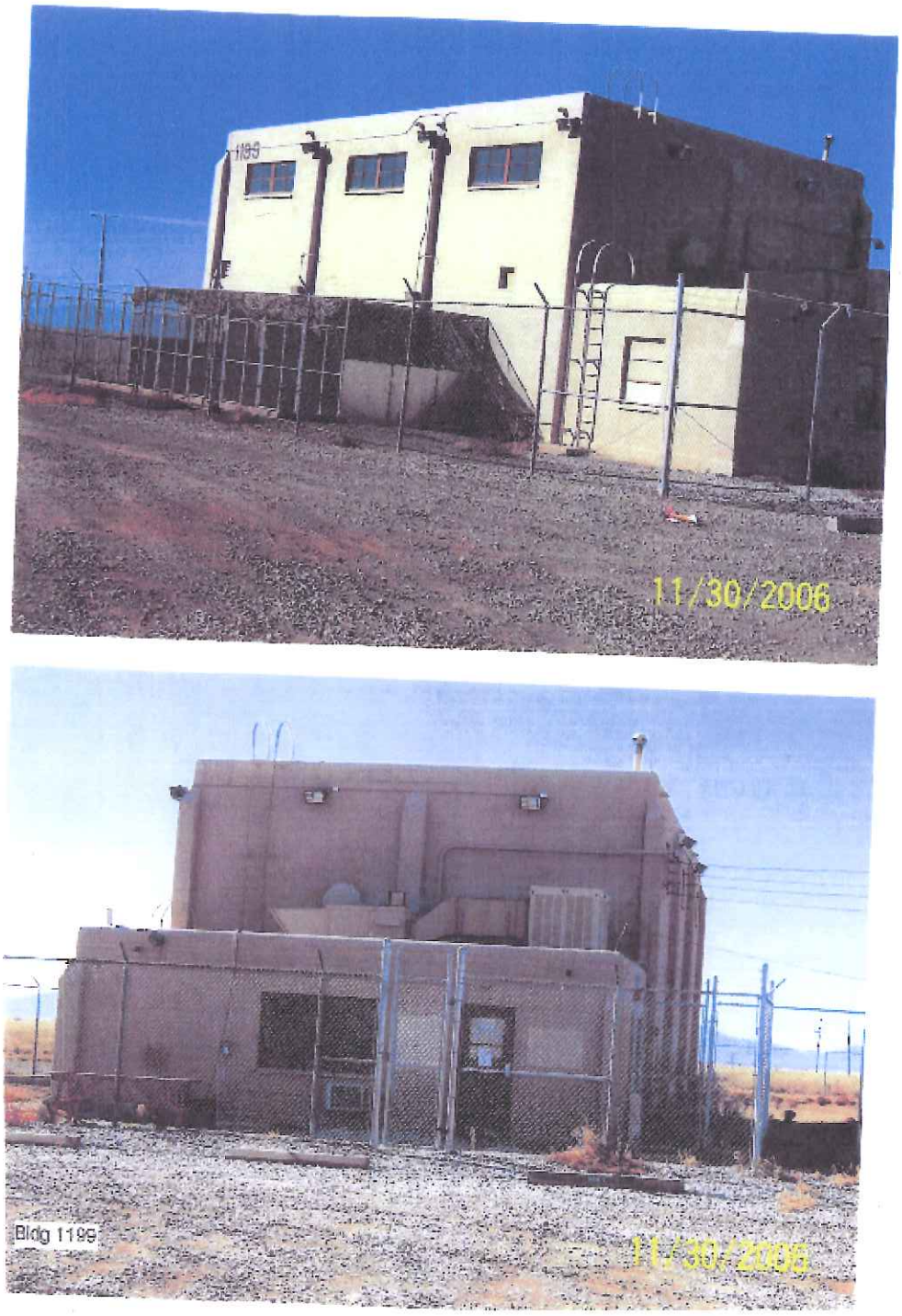


Figure 7: Pictures of Bldg 1199

INACTIVE SEPTIC SYSTEMS

BUILDING 1200

Specifications and History: See "Cold War Survey".

Three drawings were found for this building. These drawings show the Plumbing Floor Plan (Attachment 14), a Floor Plan (Attachment 15) and the Septic Tank and Drain Field (Attachment 16).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab, Medical (VACANT).
Historic: Space Biology Laboratory.
Street Address: 841 Douglas Road, HAFB, 88330-7823.

Building Number: 1200

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [ ] Needs maintenance [x] Deteriorated [ ] Archaeological

Comments: Building 1200 is abandoned, and showing signs of deterioration.

Degree of Alteration: [ ] None [ ] Minor [x] Moderate [ ] Major

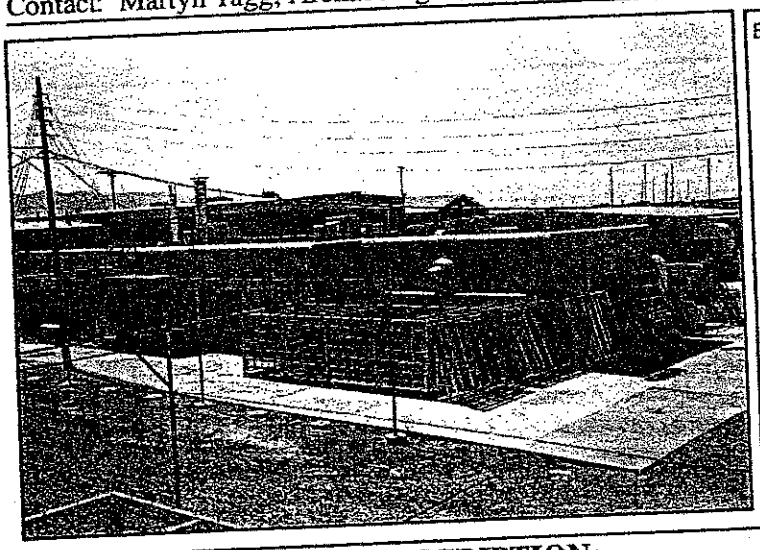
Comments: Alterations are architectural rather than structural.

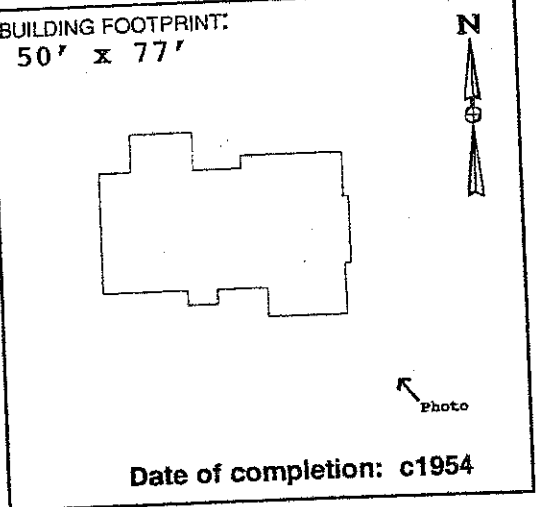
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1200 no longer retains historic integrity. See Section VI.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1954

273

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1200 is a rectangular, single-story, flat-roofed concrete masonry unit (CMU) building constructed as one of several laboratories dedicated to important aeromedical research using both animals and humans. None of the construction drawings were correctly stamped "As-built." According to Real Property Accountable Record/1200, the estimated date of construction is 1954. Subsequent improvements documented in CE File drawer #1200 include an addition to the medical lab (c1958), a covered passageway added to the boiler room (c1957), and a frame wall addition to the surgery room (c1957). Neither the builder nor the architect is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1200; Field visit Summer 1995.

Current Function: Vacant.

Original Function: Space Biology laboratory/Animal experimentation.

Interim Functions: Animal experimentation/Storage.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1200-1 (c1953).

Foundation: Concrete wall footings. Concrete slab on fill.

Exterior walls: Painted concrete masonry units (CMU).

Roof: BUR on concrete deck, supported by metal lathe and steel bar joists.

Notable interior features, including machinery:

Originally used as a medical laboratory, with work tables, work benches, built-in lockers, cabinets, operating tables, x-ray tables, etc.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:

274

One room is currently being used for storage. All medical and laboratory equipment has been removed.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Due to extensive alterations to the exterior, Building 1200 no longer retains historic integrity. Recommend, however, that this building be considered as a contributing feature in a basewide early Cold War National Register of Historic Places Multiple Property nomination.

VII. ASSOCIATED BUILDINGS:

Building 1200 was an integral part of Holloman's aeromedical facilities, including Buildings 1201, 1202, 1203, 1204, 1205, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Since its original construction c1954, Building 1200 has been used as a laboratory and medical facility for a wide variety of research animals, including trout, black bear, dogs, mice, and chimpanzees. Although currently abandoned, this building featured a lead-lined x-ray room, an autopsy room, an observation room, a surgery room, a dark room, and animal pens (c1954: CE File #1200-1). Built-in steel lockers, metal cages, x-ray tables, work benches, food bins, operating tables, scrub sinks, surgical lamps, sterilizers, etc. have been removed. Two exterior doors have been blocked in, and thirteen exterior windows have been blocked in. One exterior door and one exterior window have been added. Interior walls have been added, removed, or relocated. A storage room has been added to the south elevation. Animal cages remain at the west elevation. The presence of dead rodents, foul odors, torn pipe and duct insulation (possible containing asbestos) and peeling paint (possible lead-based) represent hazards to health and safety. Because of the unique and important nature of the research conducted here, recommend that this building be nominated as a contributing feature as part of an HAFB early Cold War National Register Multiple Property nomination.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?
[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.
Comments: The building has been located at its present location since c1954.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?
[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact
Comments: Most of the original doors and windows have been removed. All of the equipment has been removed. Most of the original finishes have been obscured.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting
To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting
Comments: Continues to be situated in an isolated setting with the other Aeromedical facilities.

Materials: To what extent have the original materials used to construct this structure been retained?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Elevations have changed due to modified openings, an addition, and a covered passageway. Interior wainscot and cornice removed, wall tile added.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Exterior walls and cages remain intact. Some architectural features remain. Most of the original interior workmanship has been lost.

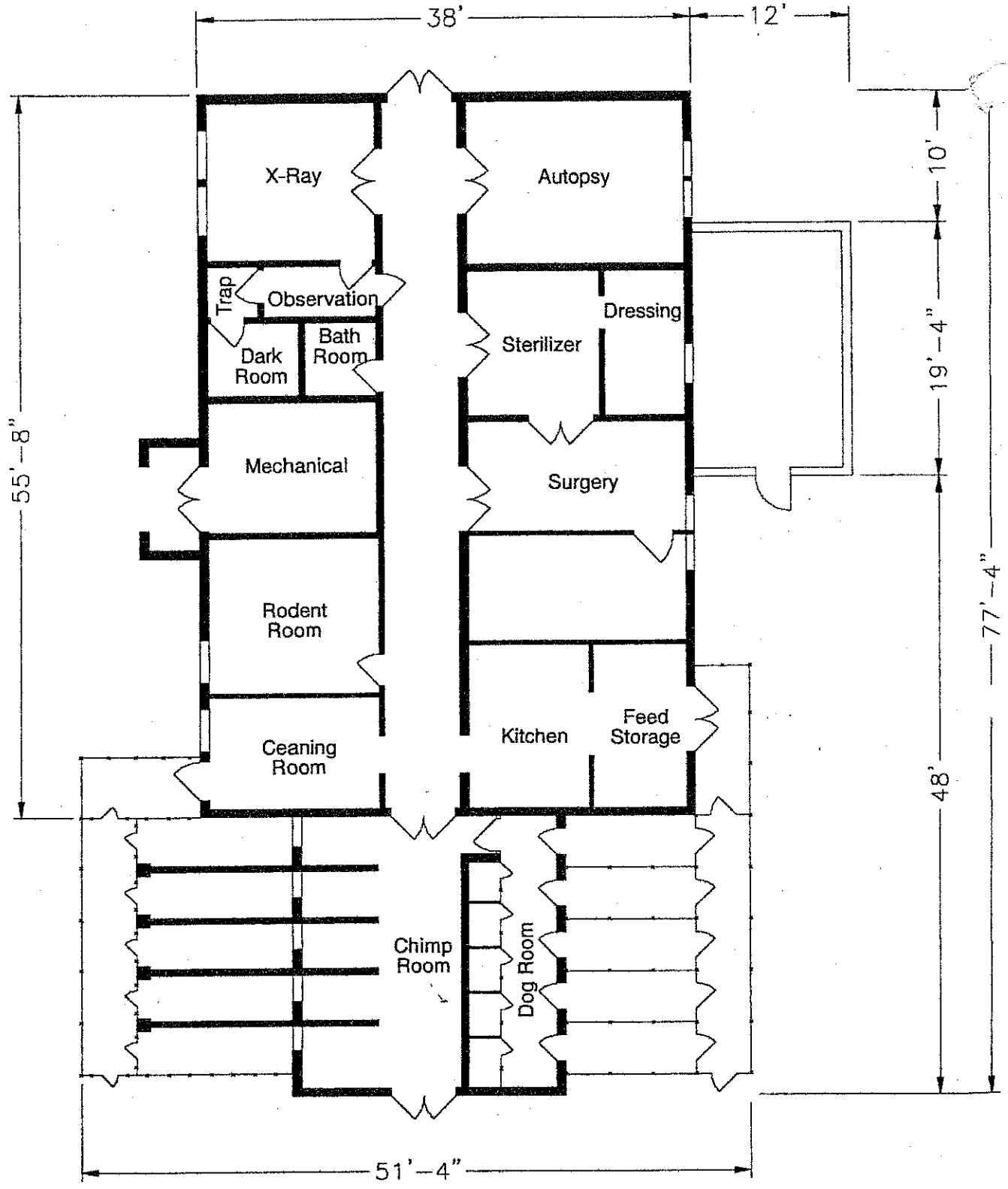
Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?
[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity
Comments: Building 1200 continues to be situated within the compound set aside for animal research. Chimpanzee research continues today in nearby buildings.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?
[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity
Comments: Although all of the equipment has been removed, this building still demonstrates a link with its past by virtue of its setting, the odors, and the animal cages.

X. FURTHER INFORMATION:

Surveyed By:
Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #94**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1200-1 (c1954)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1200** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

BUILDING 1201

Specifications and History: See "Cold War Survey"

Seven drawings were found for this building. These drawings show the Septic Tank and Absorbent Area Layout, Isometric Sewer Layout, Septic Tank Plan and Septic Tank Elevation (Attachment 17), Floor Plan (Attachment 18), Layout Plan (Attachment 19) and Systematic-Waste System (Attachment 20).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab Medical.
Historic: Aero. Medical Field Lab.
Street Address: 821 Douglas Road, HAFB, 88330-7823.

Building Number: 1201

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Structurally intact. In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

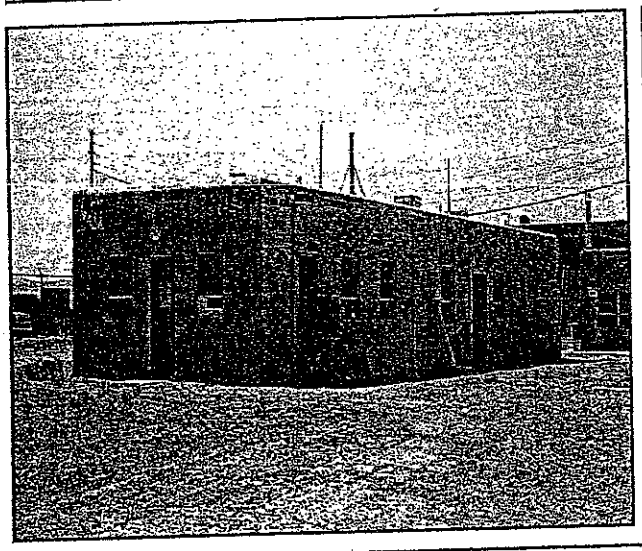
Comments: Mortuary/autopsy room added as subsequent improvement c1958.

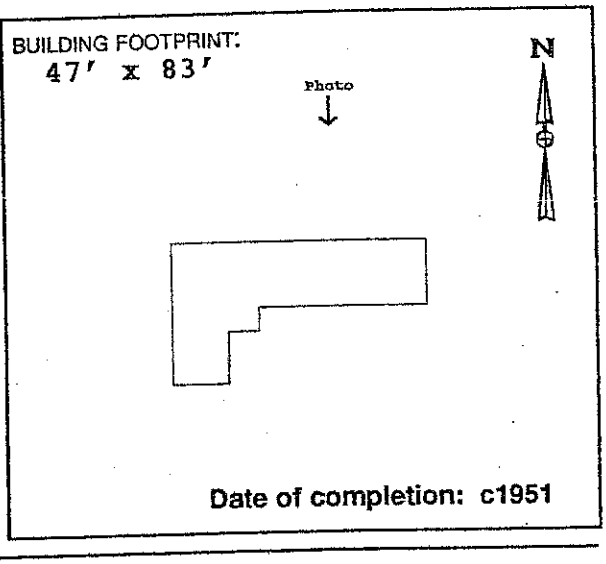
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible under Criteria A and/or C at a national level.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1951

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1201 is an "L-shaped", single-story, flat-roofed, building constructed primarily using painted 8" structural clay tile and exhibiting asymmetrical door and window placement. Animal cages occupy the west elevation. Real Property Accountable Record/1201 indicates that this science laboratory was constructed c1951. The construction drawings consulted were stamped "As-Built," although no date was given. Both the architect and builder are unknown.

At least two structural modifications may be viewed as subsequent improvements to the original building, including the addition of a Mortuary/ Autopsy Room (c1958: CE File #1201-4), and the addition of a rooftop observation deck (c1952: CE File #1201-5).

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1201.

Current Function: Carpentry shop; Employee break room; Office space.

Original Function: Aerospace Medical Lab; Animal experimentation.

Interim Functions: "SC Lab Human Eng" (n.d.); "SC Lab Med (c1968).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1201-1 (c1951).

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted structural clay tile.

Roof: Built-up roof w/ gravel on sheeting, supported by 2x12 wood joists.

Notable interior features, including machinery:

Fixed chain link cages, lab tables, equipment tables, work tables, wood storage bins, sterilizer, incubator.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL: (Based on field visit Summer 1995

[c1958 SUBSEQUENT IMPROVEMENT--MORTUARY/AUTOPSY]:

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted cement masonry unit (CMU).

Roof: 5-Ply built up roof on concrete slab. Steel joists.

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Notable interior features, including machinery:

Washer and dryer, kitchenette, tool room, table saw, furniture, lockers.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1201 is eligible to the National Register under Criteria A and/or C at a national level of significance for its vital role in early aeromedical research in support of the early Cold War space exploration mission.

VII. ASSOCIATED BUILDINGS:

Building 1201 was associated with the other Aeromedical facilities, including Buildings 1200, 1202, 1203, 1204, 1205, 1206, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1201 retains historic integrity as far as the structure itself goes. Very little physical evidence remains of this structure's original use as an animal laboratory. The cages have been removed. Two interior walls with doors have been added. One interior wall has been removed. Service sinks, work tables, wooden bins, an incubator, and other lab support items shown on c1951 construction drawings have been removed. An area of the original roof approx. 10' x 13' was reinforced with three inches of concrete for observation deck c1952 (CE File #1201-5). A mortuary/autopsy room was added c1958. These additions may be viewed as early improvements, and do not diminish Building 1201's historic integrity. Drawings itemize a "2-body" mortuary room, an autopsy table, a band saw, cabinets, a sterilizer, a photography area, and other laboratory equipment. This equipment has been removed. This room currently serves as a lounge area for employees. Due to the important research conducted here in support of this nation's space program, further research is warranted. Recommend that Building 1201 be included in a Cold War-era Multiple Property nomination. Suggested routine maintenance: This building is showing the signs of long-term neglect. Fill the stress cracks at the exterior corners. Scrape and paint exterior walls. Replace window glass and door hardware as needed.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Continues to be situated in an isolated compound.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Original structure essentially intact. Interior lab equipment and cages removed.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Enclosed by chain link fence topped with barbed wire, along with other research facilities. Chimpanzee research continues in nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Clay tile walls still intact. Some glass block windows remain. Some glass block windows blocked in when addition constructed. Floor tiles removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Roof, walls, and exterior openings remain essentially the same. The east elevation changed due to an early addition. Interior partitions, openings, and finishes have changed.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Historic photographs show that the natural, historic, and aesthetic character of Building 1201 has been retained.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

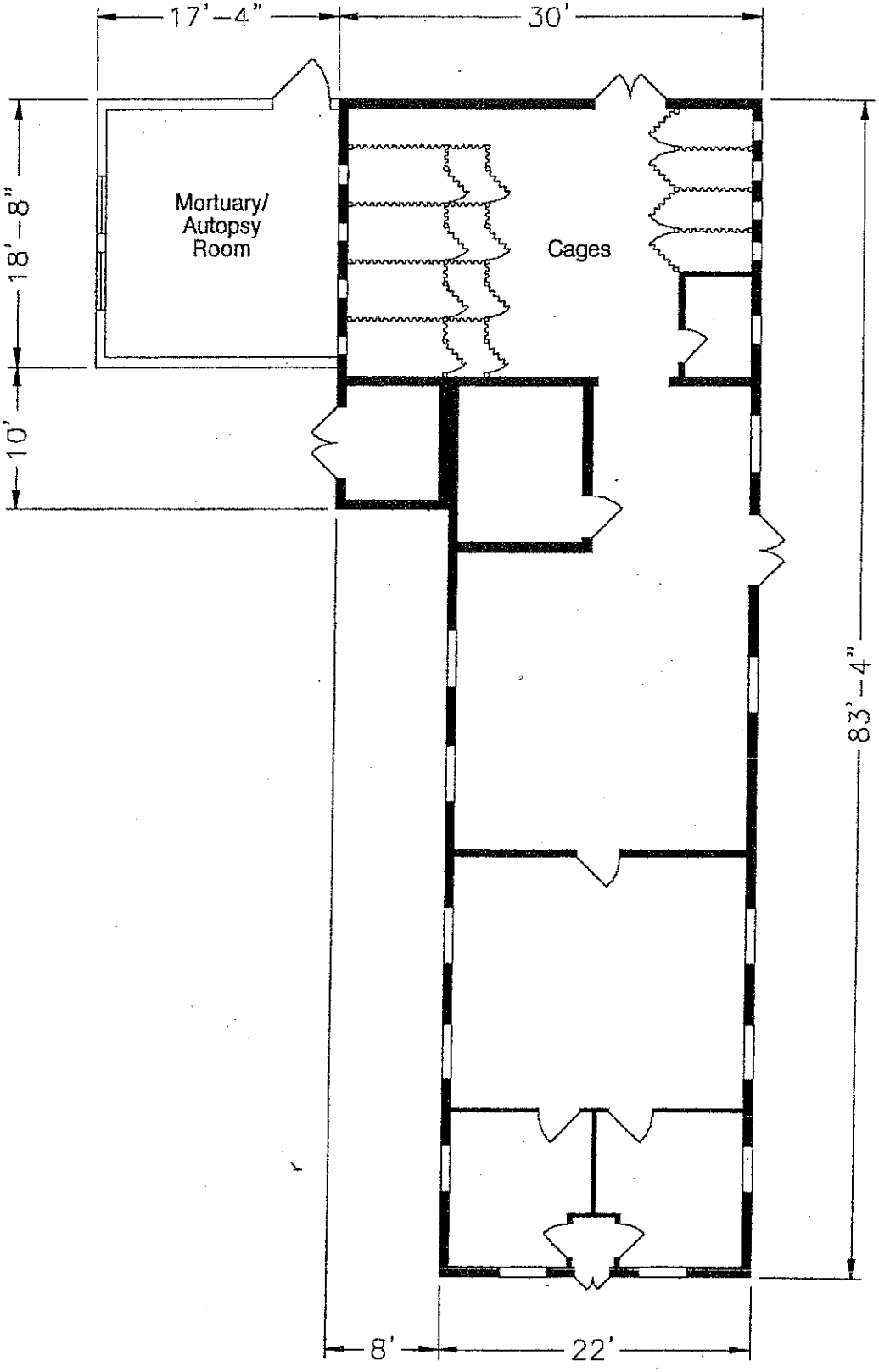
Comments: Building 1201 retains a visible link with its period of significance.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #91**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1995**



280

Source: CE File #1201-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1201** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

Buildings 1219, 1221, 1235 and 1239
An on site inspection was completed on 20 Dec 07 with the current facilities manager, TSgt Pote, he has been the facilities manager for the past nine years. During the inspection it was discovered that there are sink holes on all leach fields in the compound. All buildings in this compound have separate drains for the bathrooms. All buildings are also currently connect to the base sewer system.
Attachment 55d shows the leach field location for Buildings 1219, 1221, 1235 and 1239.

BUILDING 1219

This building is the Administrative Offices for the Munitions Maintenance Squadron. It was constructed in 1985 and covers 4476 SF.
There are Men's and Women's Bathrooms that discharged into two (2) septic tanks prior to the installation of a sewer main that discharges to the Base Waste Water Treatment Plant.

INACTIVE SEPTIC SYSTEMS

Building 1221

This building is in the Ammo Depot and was originally constructed for ammunition storage. It was later switched to store inert munitions.
The building was constructed in 1983 and covers 2857 SF.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan (Attachment 21), Floor Plan (Attachment 22), Partial Plan (Attachment 23), Septic Tank Details and Sewage Disposal System (Attachment 24) and a Profile of Sewer Line Septic Tank and Disposal Field (Attachment 25).

INACTIVE SEPTIC SYSTEMS

BUILDING 1226

This is a munitions maintenance shop building constructed in 1985. It has 2945 SF of floor space.
Facilities installed include:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Utilities Plan (Attachment 26), Plumbing Demolition Plan (Attachment 27), Plumbing and HVAC Plan (Attachment 28) and Waster/Water Piping Detail (Attachment 29).

In Figure 8 on the following page it can clearly be seen where the leach field is in relation to where building 1226. This is the leach field for building 1219, 1221, 1235 and 1239 as well. In Attachment 46 (a map showing many of the building on Holloman AFB) it can be seen where building 1226 is in relation to these building.

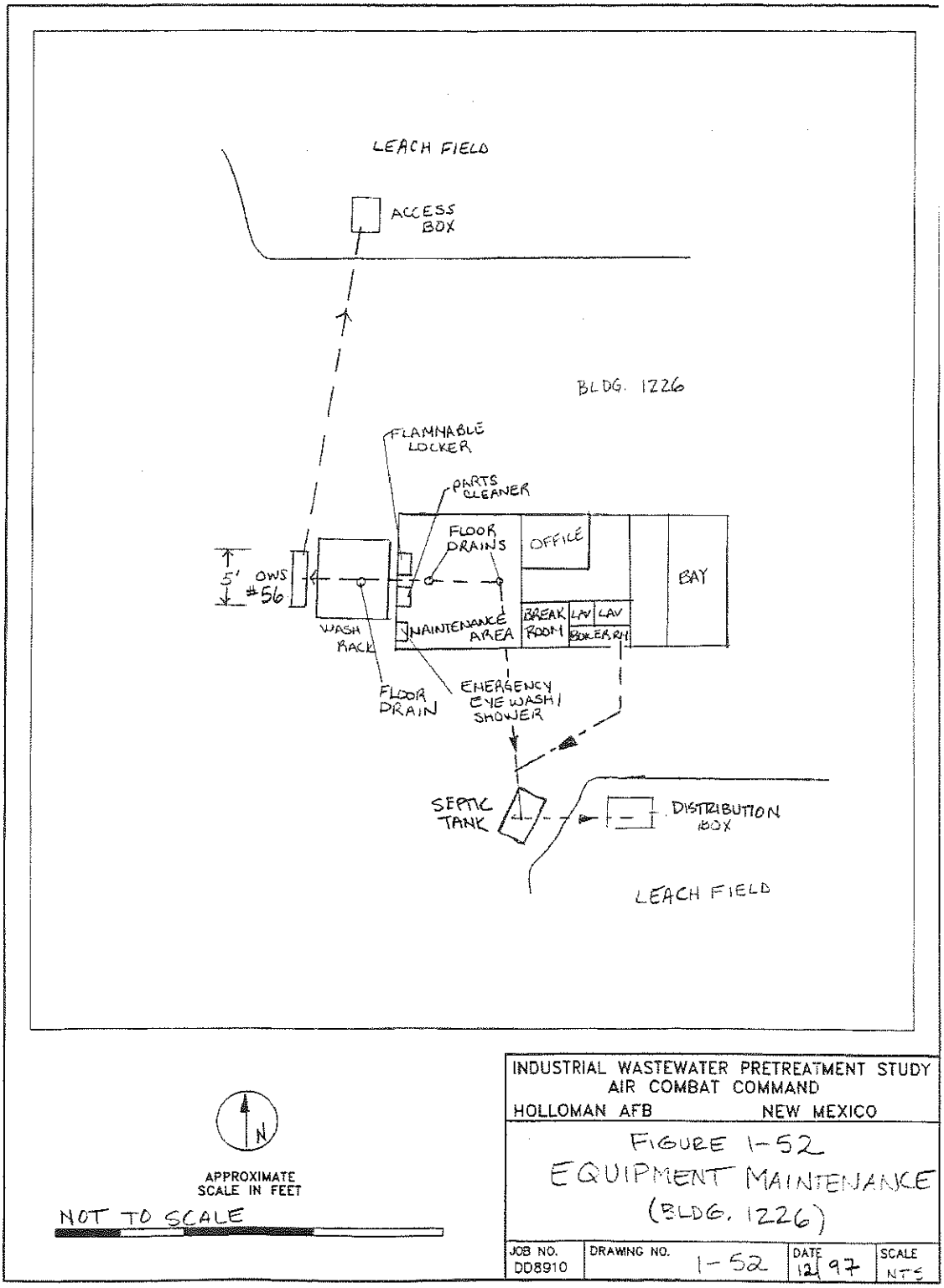


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Figure 8: Drawing of Leach field

INACTIVE SEPTIC SYSTEMS

BUILDING 1235

This building was constructed in 1964 and contains 3000 SF of floor space.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, a drawing for this building was also located. This drawing (Attachment 30) shows the Site Plan, Septic Tank Details and Sewer Clean Out.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST

INACTIVE SEPTIC SYSTEMS

BUILDING 1239

This is another building in the Ammo Depot. It was constructed in 1971 and contains 1920 SF.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Urinal
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan, Septic Tank Details, Utility Plan (Attachment 31), Floor Plan (Attachment 32), Grading Plan (Attachment 33) and Lavatory Detail (Attachment 34).

INACTIVE SEPTIC SYSTEMS

BUILDING 1250

This building was constructed in 1957 and contains 2890 SF.
It was originally a water pumping station. In 1985 it was changed into a storage facility. As part of the change in service the bathroom facilities were removed. Currently it has a large infestation of vectors and it is unsafe to go inside. The POC for this building is Mr. Chuck Price.
The original facilities consisted of:

- Toilet
- Lavatory
- Floor drains for the water pumps

INACTIVE SEPTIC SYSTEMS

BUILDING 1251

This building was constructed in 1965 and contains 1300 SF.
In the records it is listed as a Research and Testing Shop. It currently has a large infestation of vectors, therefore it is not safe to go inside. The building has been vacant since the mid 90's. The point of contact for this building is Mrs. Eisele.
It contains the following facilities:

- Toilet
- Lavatory

INACTIVE SEPTIC SYSTEMS

BUILDING 1269

This building was constructed in 1966 and contains 3262 SF.
The original service was a Medical Science Laboratory. It has been relegated to a storage facility.
The facilities consisted of:

- Toilet
- Lavatory
- Kitchen Sink with Garbage Disposal

Site Specific Contingency Plan: See Attachment 1

Max. Spill Quantity (gal): 55

Chemical	Container Type
Benzene	NA
Acetonitrile	

REMOVED SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	1102	1952	6'x4'x8'10"	2500
2	1103	1948	7'x9'x3'2"	1412
3	1108	1958	6'x9'6"x6'3"	750
4	1119			
5	1150	1953	4'x9'x6'3"	2500
6	1154			
7	1166	1960		450
8	1175	1949	5'1"x10'4"x6'10"	2970
9	1176	1959		640
10	1265	1992		1200
11	1173			

REMOVED SEPTIC SYSTEMS

BUILDING 1102

Specifications and History: See "Cold War Survey." More information can be seen in the drawings. The drawings that have been found for this building are as follows the Grading Plan (Attachment 35), Septic Tank Details and Boring Log Results (Attachment 36), Leaching Well and Cover Details and Sewer Clean Out (Attachment 37).

Attachment 55c shows where the leach field was located for this building in 1984.

This building has the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Missile Radar Station.
Historic: Radar Triangulation: King I.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1102

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

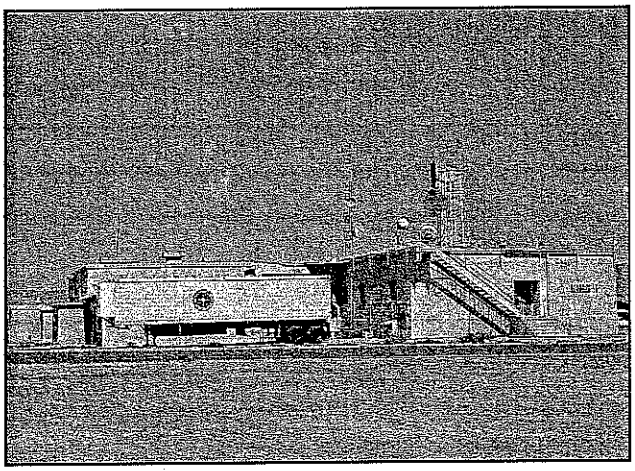
Comments: Essential structural and architectural features remain intact.

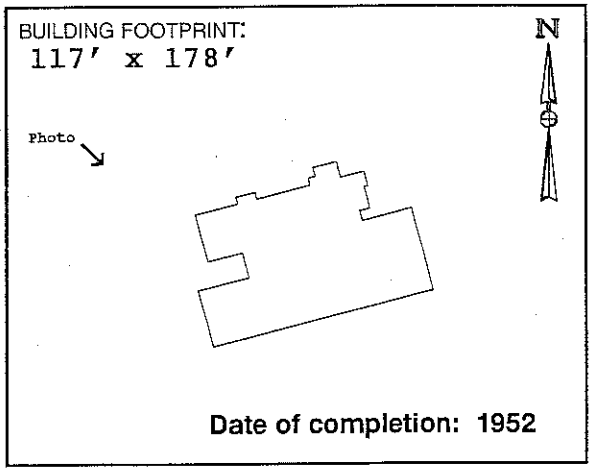
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Recommend listing as part of a Cold War Multiple Property.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1102 is a one-story concrete masonry unit, multi-shaped building with a central corridor running east-west the entire length and single rooms flanking both sides of the corridor. Original footprint shows primarily rectangular shape with a central projecting core. This core is a large open room with an upper balcony around its perimeter. Construction of the original building was completed in 1952, according to "As-built" drawings in CE File #1102-1. Surveillance display room added in 1969 (CE File #1102-1). It is unclear when north elevation additions constructed, although information in Real Property Accountable Record/1102 date the additions as being post-1970. The architect for this project was W. C. Kruger (Santa Fe, NM). The builder is unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1102.

Current Function: Telemetry and Optics. Altitude measurements.

Original Function: Missile Instrumentation Station; Mission Control.

Interim Functions: Missile Radar Station.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1102-1 (c1952).

Foundation: Concrete footing and foundation wall. Column spread footing.

Exterior walls: Concrete masonry units (CMU).

Roof: Bituminous concrete over built-up roof, ltweight concrete, supported by one-way concrete slab using concrete beams and steel beams encased in concrete.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

380

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Eligible under Criteria A and/or C at a national level of significance for important role in early Cold War-era missile and High Speed Test Track mission control and tracking. Further research recommended.

VII. ASSOCIATED BUILDINGS:

Building 1102 supported all missions at White Sands Missile Range and at Holloman Air Force Base until Building 300 and possibly 1527 at White Sands were constructed.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1102 continues to operate as a mission control building, with mostly optics and telemetry functions. The Flight and Instrument Control Room, and the Surveillance Radar rooms are vacant. Originally, missiles were fired using an analog boards (mechanical) system. When operations changed to a digital system in c1978, support moved from the central instrument control room to the north addition off of this room. Nearly all of the original interior finishes remain unchanged.

Suggested routine maintenance: Scrape, prime, and paint all block and concrete surfaces. Remove vegetation and rusted pipes by gas meter. Fill depressions at foundation, and regrade using gravel to promote positive drainage. Fill holes at concrete stoops. Replace wood bumper at dock using similar-sized lumber. Secure panel covers on abandoned electrical panels. Enclose live connections in junction boxes. Scrape, prime, and paint metal stairs. Reattach stair nose treads. Remove miscellaneous debris from building perimeter.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Still situated at the northeast corner of the intersection of Tula Peak Road, and Douglas Road.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The original floor plan remains intact.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Continues to be situated at the intersection of two roads in an isolated setting with few nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Most all original materials have been retained at both the exterior and the interior.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: All original exterior and interior room finishes remain visible. At the south elevation, one window is blocked, one window has been replaced with a door, and the door at the loading dock has been replaced. Most of the north elevation is obscured by the addition of an operations room.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1102 continues to support limited mission control operations.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

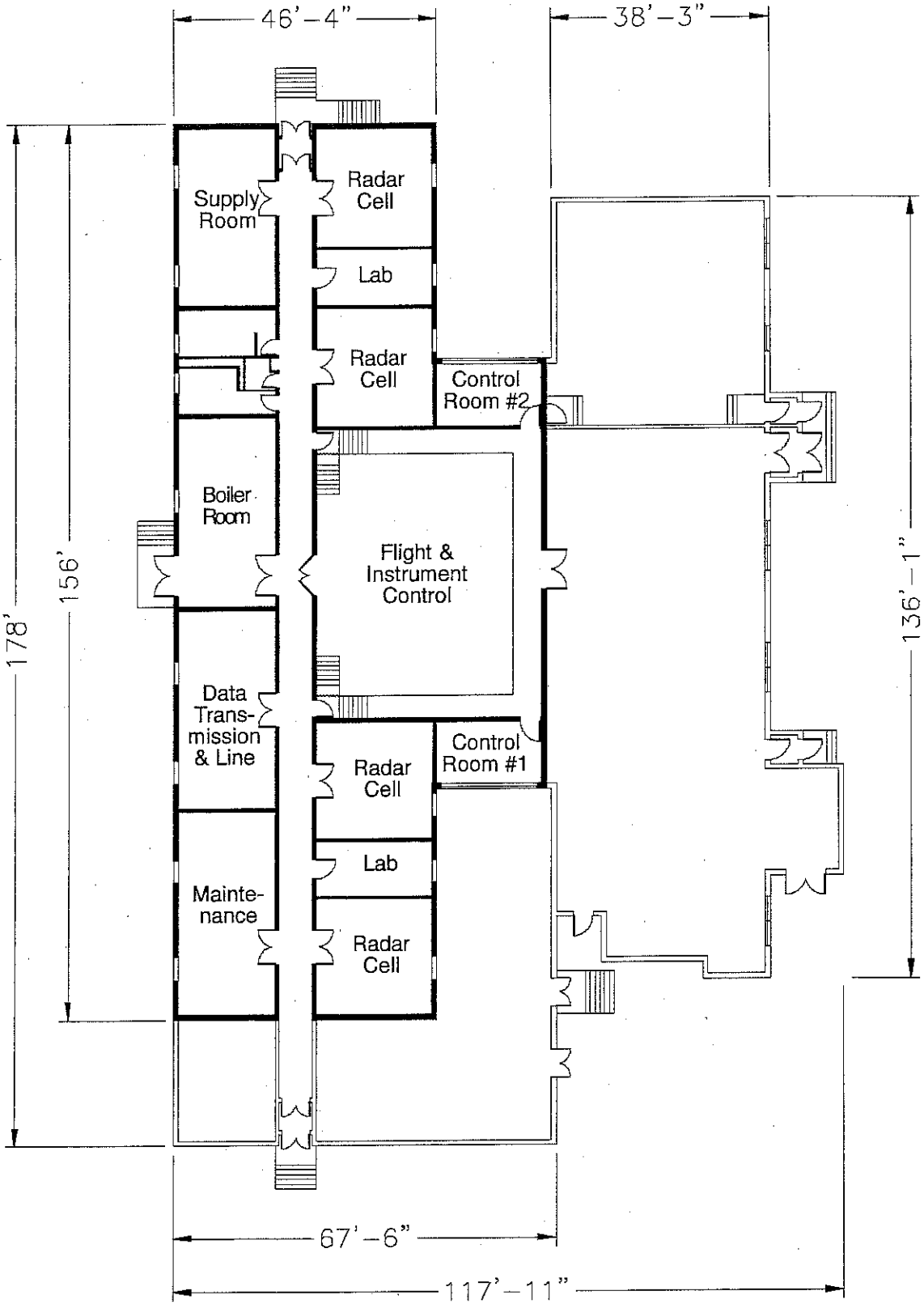
Comments: Building 1102 retains an evident link with its aesthetic and functional historic character.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #49**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1102-1 (c1952)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1102** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-6401* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1103

Specifications and History: See "Cold War Survey" the Layout Plan (Attachment 38) has also been provided.

Attachment 55c shows where the leach field was located for this building in 1984.

Facilities: This building contains the following facilities.

- Tiolets-2
- Urinals-2
- Lavatories-3
- Service Sinks-3

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Timing.
Historic: Telemetering Building.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1103

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance only.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

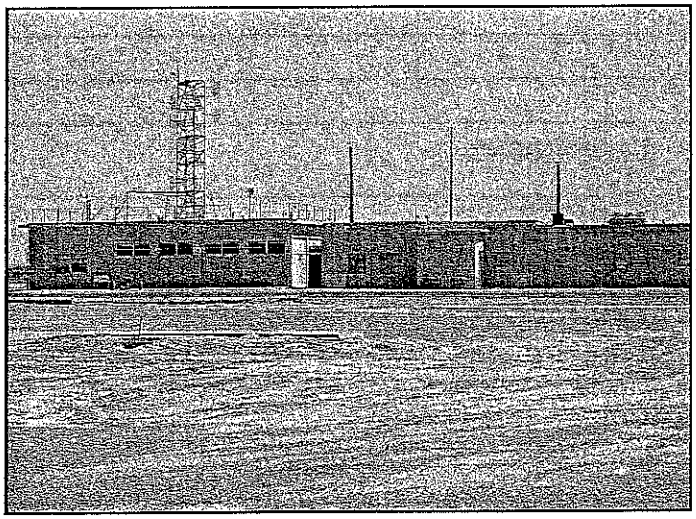
Comments: Few alterations since early improvements.

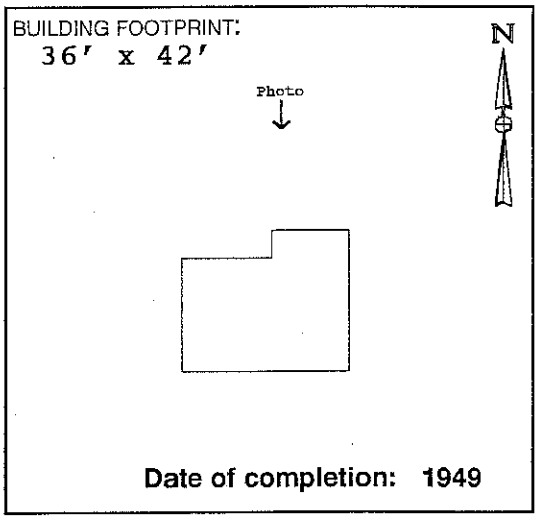
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Research recommended to determine historic use. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1103 is a one-story rectangular building with concrete masonry unit walls, and a flat roof. The original building was completed in 1949, according to "As-built" drawings located in CE File #1103-1. This original construction is centrally located, flanked to the east and west by subsequent additions. Real Property Accountable Record/1103 documents the addition of 2,930 square feet to the original building with the notation "Subsequent Improvements thru May 57." One or both additions to the original building may therefore be considered to be subsequent improvements, rather than additions that compromise historic integrity. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE: (Personal communication with Building 1103 personnel)

Current Function: (East end) Leased by WSMR to transmit mission timings.

Current Function: (West end) Unknown.

Original Function: Telemetering station for data collection of Range missions.

Interim Functions: Real Property Accountable Record/1103: "Communications CTR" (c1962); "Telecom Cen" (c1971); "Comm Fclty" (c1980); "Elec Rsch Rdr" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1103-2 (1967); CE File #1103-1 (1949).

Foundation: Concrete wall footing.

Exterior walls: Painted concrete masonry units (CMU).

Roof: Built-up roof on wood sheathing and 2 x 8 wood joists.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Although perhaps not meeting the "exceptional importance" stipulation imposed on buildings constructed within the last fifty years, Building 1103 may be eligbile for the National Register under Criterion A at a regional or national level in the year 1999. If further research determines that Building 1103 is not eligible as an individual property, consideration should be given to its eligibility as a contributing feature in a Cold War Multiple Property submission for its support of early Cold War-era test launches.

VII. ASSOCIATED BUILDINGS:

Building 1103 was associated during its historic period of significance with Building 1102, mobile data collection vans, and Building 300 at White Sands Missile Range.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1103 appears very different today from depictions on "As-built" drawings dated 1949. It is unclear whether additions to the east and west ends of the original building represent early improvements to the original building, or whether these additions represent later construction that has compromised the historic integrity of the original building. Information obtained from Real Property Record/1103 and field visits seems to indicate that the additions represent early improvements to the original building. If so, Building 1103 retains historic integrity. Further research is needed to verify the construction sequence, and to verify what early Cold War-era research activities were supported by Building 1103. Currently, Building 1103 is leased by the White Sands Missile Range. Aside from minor partitioning at the telemetering room, the original floor plan of the original building shows no alterations. Wood posts (6 x 6) that appear on original drawings to support the roof girders have been removed.

Suggested routine maintenance: Repair, or replace in kind, the exterior wood architectural features, including the soffit, fascia, wood doors, and louvers. Patch spalling concrete at foundation. Remove vegetation at roof.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Original telemetering room is now used as spare equipment storage.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Earlier location plans indicate three utility buildings situated in a row next to Building 1103 to the east. These buildings have been removed. Continues to be set in a somewhat isolated setting, in the vicinity of King-I.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Unable to access some rooms. Those rooms that were accessed, however, appear to have most of the original materials intact. A brick chimney and a metal stack have been removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original windows at north elevation have been covered up at the interior. The telemetering room has been partitioned (reversible).

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity

Comments: Building 1103 personnel are actively engaged in serving as a timing link for White Sands Missile Range tests.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

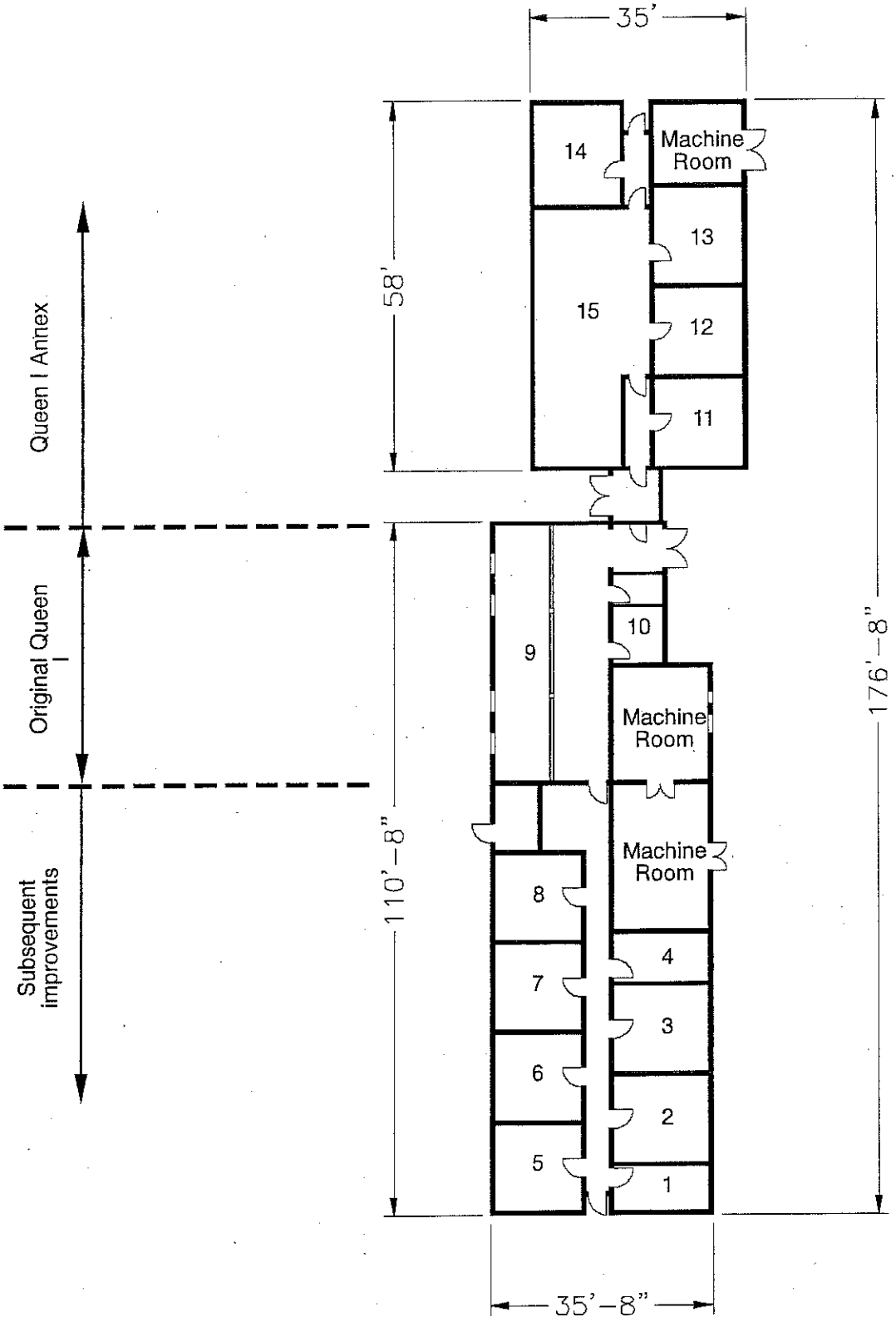
Comments: Building 1103 continues to provide support to the White Sands Missile Range.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #47**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: Dynalectron *Facilities Handbook*, c1964.

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1103** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1108

This building was constructed in 1958 and contains 2626 SF of floor space.
The building was originally built to serve as the telephone exchange. In 1980 it was retitled as a communications facility.
The building contains the following facilities:

- Toilet
- Lavatory
- Janitorial Sink

The drawings provided (Attachment 39-40) show a Utility Plot Plan, Septic Tank Details, Sewer Clean Out, Toilet Room Details and Plan Details.

Attachment 55e shows where the leach field was located for this building in 1984.

Site Specific Contingency Plan: See Attachment 1 and 2

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate into local area on ground

Tank location: North of facility

Fuel Flow - North

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST
MOGAS	250 gal each/ 2 /AST

REMOVED SEPTIC SYSTEMS

BUILDING 1119

This is an Army owned building that contains 2224 SF of floor space. Use and maintenance of the building was transferred to the Air Force in 2005. Prior to the Air Force taking possession the Army had delegated the building to the GSA for use as a vehicle maintenance shop. Once the Air Force took over, the building changed service to an electrical shop and storage facility.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
Diesel	250 gal ea/ 3 /AST
MOGAS	250 gal ea/ 2 /AST
Diesel	750 gal ea/ 3 /AST

Figure 9: Picture of Bldg 1119

REMOVED SEPTIC SYSTEMS

BUILDING 1150

This is also an Army owned building and therefore details are lacking from Holloman's records. The building has 2844 SF.
The original service is unknown, but since the Air Force started using the building it has been used as storage space.
It contains the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 9: Drawing of Bldg 1150

REMOVED SEPTIC SYSTEMS

BUILDING 1154

This is an Army owned building and there is no information in Holloman's files pertaining to this building.

Attachment 55c shows where the leach field was located for this building in 1984.

REMOVED SEPTIC SYSTEMS

BUILDING 1166

This building was constructed in 1960 and contains 4955 SF. The structure is a Test Track Shop/Storage Building known as the "Break Setter Building".
The facilities include:

- Toilets-2
- Urinal
- Lavatory
- Shower

Attachment 41 is a drawing showing the sewer layout and the septic tank details.

Attachment 55c shows where the leach field was located for this building in 1984.

Site Specific Contingency Action: See Attachment 3

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate in local area on ground; if full tank or drum spilled' the substance may reach open ditch.

Material Compatibility: No material incompatibilities

Chemical	Container Type
Oil/Water Separator Waste	500 gal/ 1 / UST

Figure 10: Picture of Bldg. 1166

REMOVED SEPTIC SYSTEMS

BUILDING 1175

Specifications and History: See "Cold War Survey"
Facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

In Attachments 42-44 a trench pit, the toilet room details, the trench junction to UPS, the sanitary sewer manhole and water and sewer piping can be found for Bldg 1175.

Attachment 55c shows where the leach field was located for this building in 1984.

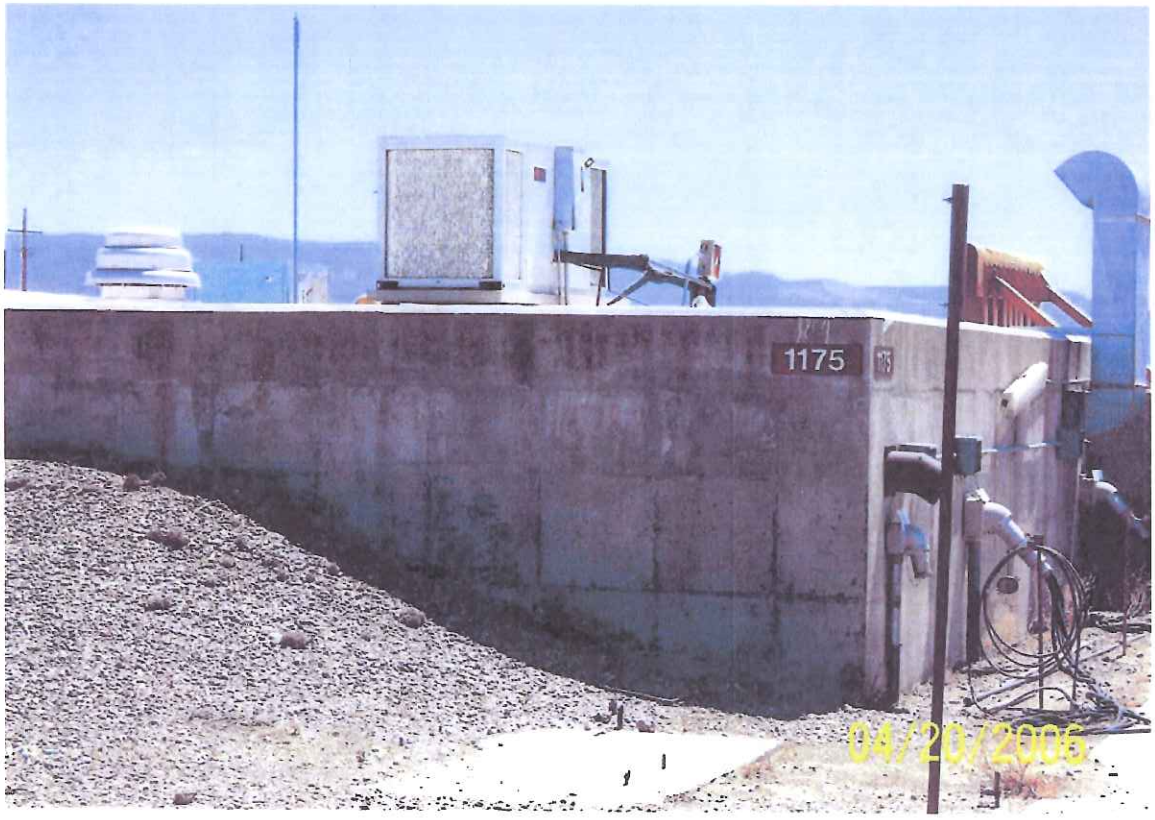


Figure 11: Picture of Bldg 1175

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Blockhouse--"Alpha".
Historic: Blockhouse--"Alpha".
Street Address: 1656 Test Track Rd., HAFB, 88330-7848.

Building Number: 1175

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1175 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

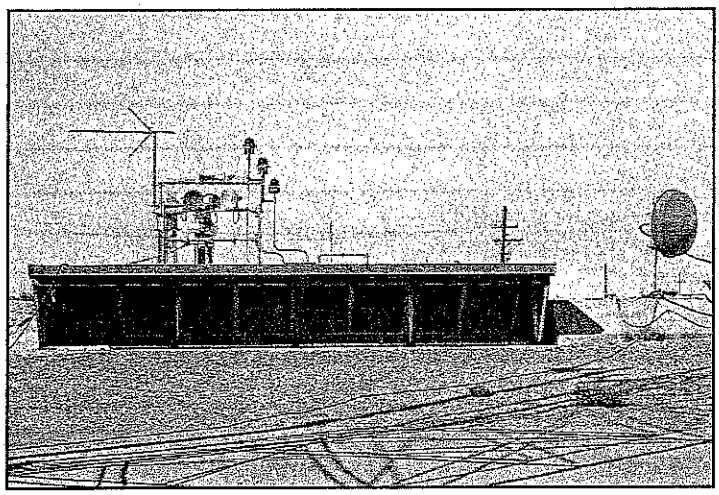
Comments: Modernization at interior to enable continued Test Track use.

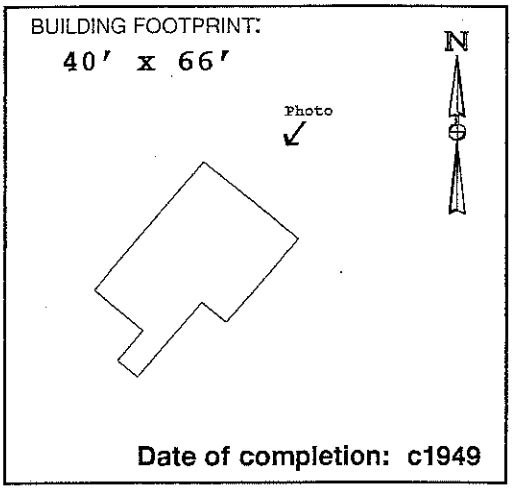
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible for the National Register under Criteria A and/or C.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1175 is an irregularly shaped, one-story concrete structure, built mostly below grade. The building is accessed by a ramp leading down to double doors at the southwest elevation. These doors access the original launch control room constructed in c1949. This entrance, three entrances off of the ramp, and windows facing the track (northeast) are the only visible openings. A 15′ x 32′-6″ addition was constructed at the northwest elevation in 1960 (CE File #1175-2). Another addition, adjacent to northwest side of ramp was completed in 1981 (CE File #1175-3). The ramp extension was also constructed at this time. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1175; CE File #1175-1 (c1949).

Current Function: Launch control facility, High Speed Test Track.

Original Function: Launch control facility, High Speed Test Track.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1175-1 (c1949); CE File #1175 (c1980).

Foundation: Concrete footings.

Exterior walls: Reinforced concrete.

Roof: 3-foot thick reinforced concrete.

Notable interior features, including machinery:
A long row of thick blast-proof windows faces the track to the northeast.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

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VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

"Alpha" Block house Building 1175 is one of the original High Speed Test Track support facilities, constructed c1949 to provide launch control. Recommend that Building 1175 be nominated under Criteria A and C as part of a basewide early Cold War Multiple Property listing.

VII. ASSOCIATED BUILDINGS:

Building 1175 operated, and continues to operate, in support of the high speed test track launching activities, along with Buildings 1162, 1163, 1161, 1645, and the Horizontal Test Stand facility (Buildings 1159 and 1160).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1175 retains historic integrity. Due to its national level of significance under Criteria A and C, recommend that Building 1175 be listed along with the other test track support buildings as part of a Multiple Property nomination to the National Register of Historic Places.

Subsequent improvements to the original Building 1175 augmented the original design and function as a launch control facility for important research conducted at the high speed test track. The interior was renovated in 1984 (CE File #1175-4). Although this renovation obscures original interior finishes, Building 1175 as a whole retains historic integrity of location, design, setting, workmanship, materials, feeling, and association. Of interest to future researchers may be the dramatic changes in computer technology which have occurred since the construction of Alpha Blockhouse: Computers which at that time required several rooms to house, now occupy considerably less space. Launch control operations continue at Alpha Blockhouse, although rooms designed to hold early equipment are virtually empty.

Suggested routine maintenance: Repair bond beam where steel is exposed. Remove vegetation at exterior embankments. Remove debris at front walkway.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Subsequent improvements to the original floor plan added to Building 1175's design and function as a launch control facility.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Except for the construction of smaller buildings in the vicinity, the original setting of Building 1175 near the test track launch pad has been retained.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: The raised wood floor in the console room has been removed. The original light fixtures have been removed. One wood and glass partition has been removed. Sheetrock® walls, carpeting, wainscot, and linoleum have been added to the control room.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original workmanship at the northeast elevation, and at the entrances at the ramp is still visible. Interior renovations hide the original architectural craftsmanship.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1175 continues to function as a launch control facility for the High Speed Test Track.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

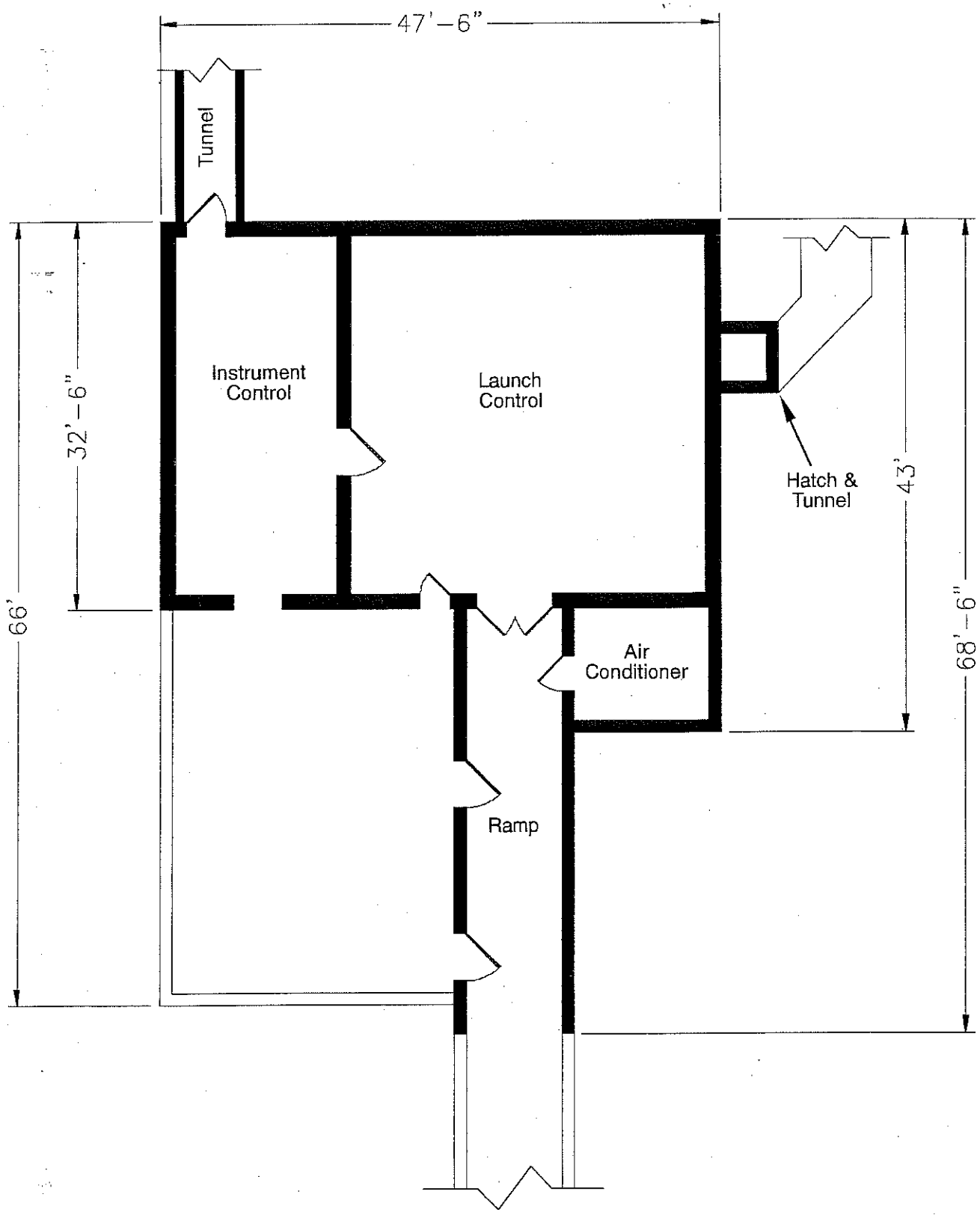
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #35**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1175 (c1980)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1175** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1176

This building was constructed in 1959 and contains 3850 SF.
The building is located at the Test Track and is known as the Sled Launch Shop.
Facilities include:

- Toilet
- Lavatory
- Shower

In Attachments 45-48 a plumbing plan, new drain pit, utility plan, sewer clean out, utilities contour plan and septic tank details can be found for Bldg 1176.

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 12: Picture of Bldg 1176

REMOVED SEPTIC SYSTEMS

BUILDING 1173

This building was constructed in 1957 and contains 17,428 SF.
The building is the main office building at the Test Track.
It contains the following facilities:

- Toilets-8
- Urinals-4
- Lavatories-9
- Janitorial Sinks-2

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 13: Picture of Bldg 1173

REMOVED SEPTIC SYSTEMS

BUILDING 1265

This building was constructed in 1957 and covers 43,388 SF.
This is the Inertial Guidance Facility, previously known as the Guided Weapons Lab.
The building contains the following facilities:

- Toilets-12
- Urinals-6
- Lavatories-12
- Janitorial Sinks-5

This building has been attached to the sewer system at Holloman AFB since before 1984.

In Attachments 49-53 a Water Piping Diagram, Partial Plumbing Plan, Floor Plan, Building, Pavement and Utilities Layout, Sewer Clean Out, and Enlarged Plan can be found for Bldg 1265.

North Wind

Letter No. NW-2008-155

Mr. Dave Griffin
Project Manager
49 CES/CEV
550 Tabosa Ave.
Holloman AFB, NM 88330-8458

11 March 2008

SUBJECT: Technical Memorandum summarizing the decommissioning of inactive septic tanks at HAFB in January of 2008

Dear Mr. Griffin:

Reference Contract Number: W9128F-04-D-0017 DO-0017

Attached please find a copy of the above referenced Technical Memorandum and attached State of New Mexico On-Site Liquid Waste System Abandonment forms. Also attached are copies of the daily reports for the field work.

Please contact me (phone 785-838-3141 or email at tmatzen@northwind-inc.com) or the Program Manager, Rusty Gilbert (phone 210-722-4074 or email at rgilbert@northwind-inc.com) if you have any questions.

Sincerely,

Thomas A. Matzen, P.G.
Project Manager
North Wind, Inc.

Attachments: Technical Memorandum summarizing decommissioning work conducted on inactive septic tanks at HAFB

cc: R. Gilbert (North Wind)
Mr. Tom Zink (USACE Omaha District)
Letter File

North Wind

Technical Memorandum

11 March 2008

To: Mr. David Griffin, Holloman AFB
CC: Mr. Tom Zink, USACE Omaha

From: Tom Matzen, North Wind, Inc

SUBJECT: Decommissioning of Abandoned Septic Tanks Conducted 8 - 24 January 2008 at Holloman AFB

Purpose

This memorandum summarizes the septic tank decommissioning activities conducted on abandoned STLFs from 8 through 24 January 2008 at Holloman AFB.

Description of Work

North Wind, Inc. (NWI) contracted a local septic system installer (Jontel Septic) to decommission 21 abandoned Septic Tanks at Holloman AFB. During the course of the decommission work NWI was requested also to abandon a septic tank at Building 1284 for a total of 22 tanks. North Wind provided a field supervisor to obtain excavation permits, coordinate field activities, and to ensure that quality and safety requirements were met.

Base dig permits were obtained for each of the systems prior to conducting any excavation work necessary to locate the systems. After dig permits were obtained, each system was excavated (if required) to the extent necessary to remove the top of each tank, crush or otherwise perforate the bottom of each tank such that water will not pool in the abandoned tank, and backfill each tank with clean fill per State of New Mexico requirements. Each system was pumped out (if it contained any liquid or sludge), and visually inspected prior to decommissioning.

The required system abandonment forms for each septic tank with accompanying photographs are in Attachment 1. Attachment 2 contains the Daily Progress Report/Quality Control Report Forms. Please note that these forms start at number 29. Forms 1 through 28 were used for daily reporting on the Septic Tank and Leach Field Inspection work.

Interpretation of Findings:

Several tanks were still active and so were not decommissioned. These include the tanks at Buildings 308 (actually an oil/water separator), 1097, 1219, 1226, 1235, and 1239. No septic tanks could be located at Buildings 1200, 1201, and 1269 though we did backfill an earthen pit at Building 1200 and an abandoned sewage treatment plant at Building 1201. Mr. Shawn Quarles, the Base safety person, marked Building 1190 off of the 332 form. Mr. Quarles stated that Building 1190 had been demolished and that there was nothing left at that location. The location of the septic tank at Building 1284 was such that it could not be accessed for demolition. The septic tank at Building 1091 was not abandoned at this time as NWI was unable to obtain a security escort. The tank at Building 1091 will be abandoned while NWI is working on the active septic tank upgrades.

As the abandonment forms indicate, the majority of the septic systems on the original list provided by HAFB were decommissioned per state requirements.

Table 1 summarizes the decommissioning activities and status of the listed septic systems.

Summary of Results

Table 1. Summary of septic system decommissioning activities for abandoned STLFs at HAFB.

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
1	308	01/24/08	Found an oil/water separator still in use.	Notified Base POC that this is an oil/water separator.
2	920	01/16/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
3	921	01/16/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
4	922	01/17/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
5	924	01/17/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
6	1091	01/24/08	Building is in security area. Could not obtain escort.	No action taken at this time. Will decommission tank when we are in the area doing tank replacement work.
7	1097	01/23/08	Found that the septic tank for this building is also hooked into Bldg 1099 and is still in use. Inspected system. This septic tank has no manholes, bottom is damaged and is leaking, no baffle present, leach field is dry and full of dirt.	Turned system back over to active list and inspected system. Inspection form is attached.
8	1190	01/14/08	During the course of obtaining a dig permit for this Bldg the safety person, Mr. Shawn Quarles, marked this one off of the 332 form. Mr. Quarles stated that this Bldg had been demolished and that nothing was left at that location.	Notified Base POC of situation regarding Bldg 1190

North Wind

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
9	1194	01/09/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
10	1196	01/08/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
11	1199	01/09/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
12	1200	01/11/08	No septic tank located. Did locate abandoned earthen pit with a concrete cover. Notified Base POC of situation and received instructions to backfill and abandon.	Removed concrete cover over pit and backfilled pit with clean fill.
13	1201	01/11/08	No septic tank located. Did locate an old abandoned treatment plant. Notified Base POC of situation and received instructions to decommission and backfill the old treatment plant.	Demolished old treatment plant by crushing bottom and caving in sides, then backfilled with clean soil.
14	1219	01/18/08	Septic tank still in use	Notified Base POC that system is still in use
15	1221	01/18/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
16	1226	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.
17	1235	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.
18	1239	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.

North Wind

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
19	1250	01/23/08	Located abandoned septic tank. Also found an old diesel tank still containing fuel.	Opened septic tank, pumped out, crushed bottom, and backfilled tank. Notified Mr. Gomolak at CE Environmental regarding diesel UST.
20	1251	01/23/08	Located abandoned septic tank	Opened tank, pumped out, crushed bottom, and backfilled tank.
21	1269	01/16/08	Could not locate any septic tank. Mr. Vernon (a 30+ year employee) stated that the building had been on the base sewer system for the last 30 years and that the septic tank may have been removed when the moat around the building was removed.	Notified Base POC that there does not seem to be a septic tank at this building.
22	1284 (not on original list, added at request of HAFB POC)	01/16/08	Septic tank hangs over back side of area and is not accessible for removal. This tank is a holding tank with a manual valve that drains to a ditch below. There is no water in the associated Bldg.	Notified Base POC. No action taken.

Future Work

As discussed above in Table 1 the septic tank at building 1091 still must be decommissioned. There are septic systems in that area that require repair and 1091 will be decommissioned when the other septic tanks are being repaired.

Appendix B
Photographic Log

Appendix B
Photographic Log
Building 308 (OT-C530)

Photograph No.	Task and Description
1	Vault Cover – Building 308
2	Vault Prior to Demolition – Building 308
3	Demolition of Tank Bottom – Building 308
4	Breaking Floor of Vault – Building 308
5	Collapsing Vault in Place – Building 308
6	Backfill of Vault Pit – Building 308
7	Compacting Backfill – Building 308
8	Surface Prepared for Concrete at Building 308
9	Completed Concrete – Building 308
10	Completed Monitoring Well OTC530-MW01 at Building 308

Photograph 1: Vault Cover – Building 308

Photograph 2: Vault Prior to Demolition – Building 308

Photograph 3: Demolition of Tank Bottom – Building 308

Photograph 4: Breaking Floor of Vault – Building 308

Photograph 5: Collapsing Vault in Place – Building 308

Photograph 6: Backfill of Vault Pit – Building 308

Photograph 7: Compacting Backfill – Building 308

Photograph 8: Surface Prepared for Concrete at Building 308

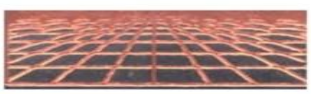
Photograph 9: Completed Concrete – Building 308

Photograph 10: Completed Monitoring Well OTC530-MW01 at Building 308

Appendix C
Geophysical Report

ULS SERVICES CORPORATION

GEOMARKOUT LOCATING Co a tradename



SAN DIEGO–LA . SF- SAC . SEATTLE . ALASKA . HAWAII- GUAM

1 (800) 528 – 8206 www.geomarkout.com 1 (866) 804 – 5734

---------- *A Veteran Owned Small Business* ----------

5 July 2012

Christopher Long, P.G.
Scientist
Federal Services
Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, TX 77077

Subject: Field Documentation Report for Geophysical Services -
Location of Utilities and Underground Features Associated
With Former UST and Septic System Sites,
Holloman AFB, NEW MEXICO (SHAW PO 783916-000 OP)

Gentlemen:

This report documents the recent Geophysical Survey field work ULS Services Corp completed at the subject site On and between the dates of 11 June 2012 thru 23 June 2012.

SHAW / ULS SERVICES CORP
GEOPHYSCIAL SERVICES
FORMER UST AND SEPTIC SYSTEM SITES
5 JULY 2012

SCOPE OF WORK

Scope of this work is includes geophysical services at approximately 29 Former UST or Septic Systems sites located across Holloman AFB that have reportedly undergone past abandonment in place or excavation activities. Geophysical services are employed in an attempt to locate potential USTs, former UST excavation areas, abandoned septic tanks or excavations and associated leach field areas. Location of underground utilities near these observed features is included. Observations are marked out in field and electronically mapped with GPS data collection and GIS presentation. Survey of each site is approximately 25 by 25 to 100 by 100 feet in size.

METHODS

Methods utilized in performance of this work include: Visual Inspection, Analog Real - Time Electromagnetic Induction Conductivity Detection (EMICD), Magnetic Locating (MGL), Ground Penetrating Radar (GPR), and EM Pipe and Cable Location (EMPCL). A sub-meter WAAS GPS receiver with automatic real -time differential correction and ESRI Arcpad software is utilized to collect observation data. ESRI Arc View 10 GIS software is utilized for mapping presentation.

EMIMD ground induction methods are employed to detect both 1) broad metal mass anomalies (Rectangular Surface Projections) or conductive zones that may be indicative of potential USTs – Septic tanks, conductive metal debris, steel reinforced concrete, UST's, building hosts, piping, building demo materials, drums, sumps or other unknown burial materials; and 2) to detect relative lateral changes in conductive zones of soil or backfill materials relative to native soils. Former UST excavations and septic -leachate material may potentially have a higher conductive response or well drained leachate fill materials associated with septic systems may in some cases exhibit a relatively lower or quiet conductive response relative to surrounding higher conductive soil response. A two-way Cartesian grid pattern of five by five feet is walked within the search area (site). Observations are real time and marked on ground surface with paint and pin flagging. Observations are collected with a sub- meter GPS with automatic differential correction and plotted approximately onto web based imagery.

GPR is utilized to detect and potentially observe former UST excavation sidewalls as well as septic – leach field pit sidewall and fill areas. GPR is also utilized to compliment the EM Pipe and Cable utility survey work by potentially locating conductive as well as non-conductive utilities.

A EM Pipe and Cable Survey is conducted at each site by performing ambient passive live power and communication line sweeps, active ground induction sweeps, and active direct- connect or induction- clamp sweeps using existing conducts or pipes visibly nearby. Multiple active frequencies are utilized for best Detection. Utilities are identified where possible and marked unknown if not identified.

All observations are marked with hi-visibility orange-red marking paint. Some Ares are hi-lighted with black paint due to light soil conditions. GPR boundaries indicating potential septic tank and leach field areas are outlined with black paint. Pin flags are also utilized to mark these boundaries in soft soil and weed areas.

OBSERVATIONS

Site Description

The Project Site (Holloman AFB - Former UST and Septic Systems) is comprised of approximately 29 different environmental site locations (heir in referred to as Sites) . Each sites includes and varies in description from existing active building locations to in-active remote abandoned to former building areas where USTs or Septic systems were utilized in the past. Each Site is fairly flat with sandy to gravelly surface conditions. Some sites include native brush and weeds. Sites near active building areas include asphalt or concrete surfaces, sidewalks and planter areas. ULS field staff helped review historical documentation available of each site in the field. Where available, drawings and photographs were reviewed. When available, reported GPS coordinates from reports, of septic tank locations, were utilized by SHAW field staff to navigate to septic tank location to aid focus search area.

Generally there are no surface indications of USTS or Septic tanks, however some limited features exist at some sites and include potential vent riser pipes and asphalt patching, settling areas, and conidial – rectangular cracks in concrete. Surface indications of septic systems at some sites include potential inactive clean- outs pipes near building and nearby existing upgraded sewer man-hole systems that have been connected to the existing Base sewer collection system. Some septic system sites have open holes , surface erosion, and associated potential underground voids observed near the inactive cleanouts and suspected septic search area.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

General ambient or background EM conditions at this site are categorized as being high or noisy most likely resulting from caliche or saline soil conditions throughout the area. These conditions all result in a high ambient background EMICD response that are difficult to filter out, however, subtle to distinct lateral changes are observed potentially marking position of former UST excavations. Magnetic locator is not affected by saline conditions. GPR response in these conditions is poor to somewhat fair, however, subtle, trends in GPR observations exhibit dipping or high angle (from horizontal) refraction bands indicating potential soil side-wall trends allowing for location of approximate former excavations. The use of EMICD and GPR data in conjunction with historical information and physical observations are all utilized to mark the approximate location of potential former USTs in the field as shown on the GIS imagery maps.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

Similar response is observed near former septic systems. Most all septic tanks are reported to have been abandoned in place or partly crushed in place. Magnetic locator surveys revealed concentrated areas of metal response (metal anomalies) likely from metal plates and rebar in septic tanks in areas near former sewer clean-outs and next to reported septic tank locations where latitude and longitude data is available. EM Induction and GPR transects over these metal anomalies further corroborated these findings. EM Induction survey results near the effluent (down gradient) side of metal anomalies (potential septic tanks) resulted in observation of relatively moderately higher lateral response to zones of low to quiet lateral response zones near the septic tanks relative to the ambient response in surrounding area. GPR data across these zones exhibited very subtle side-wall trends that appear to corroborate with EMICD findings. The use of EMICD and GPR data in conjunction with historical information and physical observations of cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs in the field and as shown on the GIS imagery maps.

CONCLUSIONS and LIMITATIONS

The use of EMICD and GPR data in conjunction with historical information and physical observations of reported building location, vent riser location, boiler room location, existing and abandoned sewer cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs , Septic tanks and leach fields. Ambient soil conductivity at this site is very high and EM and GPR data observed is very subtle. Field trends are used to mark the approximate location of potential targets.

As in any type of survey or investigation to determine characteristics below grade, careful exploratory excavation or drilling may be needed to further help determine a more accurate determination of the subsurface. Use of hand tools and air knifing is also useful to help as a safety measure. Base one- call utilities, as well as, private 811 one –call should be consulted and recalled as necessary.

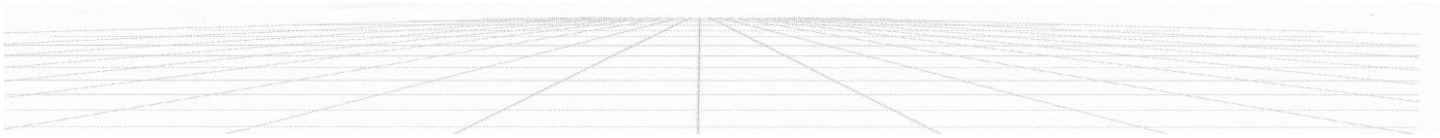
If you have any questions regarding this report please contact me at (206) 384- 2857.

Sincerely,

ULS SERVICES CORPORATION
Geomarkout tradename

Michael W. Benedict
Site Representative

Admin Office/Billing: PO Box 724 Pocatello, Idaho 83204
(208) 234-1441 Fax (208) 234-1507 1 800 301-4420
Seattle / Portland / SAC / Alaska / HWI – AS - GUAM Operations
1 - (866) 804- 5734 / San Diego – LA / Operations 1 - (800) 528-8206



BLDG 308 SEPTIC SYSTEM
HOLLOMAN AFB

WGS_1984_UTM_Zone_13N
ULS SERVICES CORP
mwb 19 June 2012

0 10 20 40 60 80
Feet

Appendix D
Sample Collection Logs

Sample Collection Log

Shaw a CB&I Solutions

- Holloman AFB

Manager Christopher Long

* STATION 1

Location Code OTC530 (Bldg 308)

RFA / COC Number 144106 - HOLT

Sample Number OTC530-IS-0001-~~MMDDYY~~ 071712

Task

Sample Name OTC530-z-OTC530-IS-0001-MMDDYY-z

Collection Date 071712

Sampling Method ~~Unknown~~ Hand Auger

Sample Type ~~Unknown~~ Grab

Collection Time 0855

Sample Purpose ~~Unknown~~ Invest.

Start Depth 3'

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Hand Auger

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chase Hill 07/17/12 Reviewed By / Dat

Sample Collection Log

Shaw Solutions

- Holloman AFB

Manager Christopher Long

* STATION 1

Location Code FIELDQC *RFA / COC Number* 144106 - H017

Sample Number OTC530-IS-0002-~~MMDDYY~~ 071712 -FD *Task*

Sample Name FIELDQC-z-OTC530-IS-0002-MMDDYY-FD-z *Collection Date* 071712

Sampling Method ~~Unknown~~ Hand Auger *Sample Type* ~~Unknown~~ Grab *Collection Time* 0855

Sample Purpose ~~Unknown~~ Field QC *Start Depth* 3'

QC Code FIELD DUPLICATE *End Depth* 5'

Sampling Equip Hand Auger *Sample Matrix* SOIL

QC Partners:
(TB) *(EB)* *(FB)* *SampleTeam* CH/CL

Containers

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Sample Collection Log

- Holloman AFB

Shaw Environmental & Infrastructure Solutions

Manager Christopher Long

* STATION 2 1

Location Code OTC530 (Bldg 308)

RFA / COC Number 144106 - H017

Sample Number OTC530-IS-0003-~~MMDDYY~~ 071712

Task

Sample Name OTC530-z-OTC530-IS-0003-MMDDYY-z

Collection Date 071712

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0905

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10'

End Depth 12'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam

Containers

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chris Long 07/17/12

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw Environmental Solutions

Manager Christopher Long

~~X~~ STATION 2

Location Code OTC530 (Bldg 308)

RFA / COC Number 144106 - H017

Sample Number OTC530-IS-0004-~~MMDDYY~~ 071712

Task

Sample Name OTC530-z-OTC530-IS-0004-MMDDYY-z

Collection Date 071712

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0930

Sample Purpose ~~Unknown~~ Invest.

Start Depth 7'

End Depth 9'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw EMS

Logged By / Dat Chase Flm 07/17/12

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw a CB&I Company

Manager Christopher Long

Station 2

Location Code OTC530 (Bldg 308)

RFA / COC Number 144106-H017

Sample Number OTC530-IS-0005-~~MMDDYY~~ 071712

Task

Sample Name OTC530-z-OTC530-IS-0005-MMDDYY-z

Collection Date 071712

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0935

Sample Purpose ~~Unknown~~ Invest.

Start Depth 14'

End Depth 16'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase HW 07/17/12

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Septic Tank Sludge

Shaw Solutions

Manager Christopher Long

Location Code OTC530 (Bldg 308)

RFA / COC Number 144106 - H017

Sample Number OTC530-SL-0001-~~MMDDYY~~ 071712

Task

Sample Name OTC530-z-OTC530-SL-0001-MMDDYY-z

Collection Date 071712

Sampling Method ~~Unknown~~ Hand Auger Invest.

Sample Type ~~Unknown~~

Collection Time 0955

Sample Purpose ~~Unknown~~

Start Depth ~~3~~

End Depth ~~8~~

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Hand Auger

Sample Matrix SLUDGE

QC Partners:

(TB)

(EB)

(FB)

SampleTeam CH/CL

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase Din 07/17/12

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

OTC530-MW-01
~~STATION~~ 3

Shaw

Manager Christopher Long

Location Code OTC530 (Bldg 308)

RFA / COC Number 144106 ~~H079~~ H036

Sample Number OTC530-IS-~~0003-MMDDYY~~ 0006-082912 ~~070712~~

Task

Sample Name OTC530-z-OTC530-IS-~~0003-MMDDYY~~-z 0006-082912

Collection Date ~~070712~~ 8/29/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time ~~0905~~ 0925

Sample Purpose ~~Unknown~~ Invest.

Start Depth ~~+0~~ 0

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth ~~+2~~ 2

Sampling Equip ~~Geoprobe~~ Hand auger

Sample Matrix SOIL

QC Partners:
(TB)

(EB)

(FB)

SampleTeam CL

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat ~~Chris Long 07/11/12~~ CGalla 8/29/12

Reviewed By / Dat

Sample Collection Log

~~UST-5380-MW-01~~ CL

- Holloman AFB

Shaw

Manager Christopher Long

* STATION # 3
OTC530-MW-01

Location OTC530 (Bldg 308)

144/166 ~~H077~~ H036

Sample Number OTC530-IS-~~0003-MMDDYY~~ 0007-082912

Task

Sample Name OTC530-z-OTC530-IS-~~0003-MMDDYY~~-z
0007-082912

Collection Date ~~MMDDYY~~ 8/29/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time ~~0905~~ 0930

Sample Purpose ~~Unknown~~ Invest.

Start Depth ~~10~~ 3

End Depth ~~12~~ 5

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip ~~Geoprobe~~ Handauger

Sample Matrix SOIL

QC Partners:
(TB)

(EB)

(FB)

Sample Team CL

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: This is also the 2' above water sample.
GW was observed at 5-8.5' bgs.

Sketch Location:

~~Shaw~~ Logged By / Dat ~~Grant Shaw 8/29/12~~ C Haller 8/29/12

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw

Manager Christopher Long

OTC530-MW-01
~~STATION~~ 3

Location Code OTC530 (Bldg 308)

RFA / COC Number 144106 - ~~H017~~ H036

Sample Number OTC530-IS-~~0003-MMDDYY~~ 0008-082912

Task

Sample Name OTC530-z-OTC530-IS-~~0003-MMDDYY~~-z 0008-082912

Collection Date ~~MMDDYY~~ 8/29/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time ~~0905~~ 0940

Sample Purpose ~~Unknown~~ Invest.

Start Depth ~~10'~~ 10

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth ~~12'~~ 12

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB)

(EB)

(FB)

Sample Team C

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat ~~07/27/12~~ 8/29/12

Reviewed By / Dat

Sample Collection Log

Bldg #308

Shaw a world of Solutions

- Holloman AFB

Manager Christopher Long

Location Code ~~OTC000~~ OTC 530 OTC530-CON1

RFA / COC Number 144106 H065

Sample Number ~~OTC000-IS-0000-MMDDYY~~ OTC530-CS-0001-101812

Task 144106 . JM 20000

Sample Name ~~OTC000-z-OTC000-IS-0000-MMDDYY-z~~ OTC530 OTC530-CS-0001-101812

Collection Date 10/18/12

Sampling ~~Unknown~~ Method BACKHOE

Sample Type ~~Unknown~~ GRAB

Collection Time 15:41

Sample Purpose ~~Unknown~~ CONFIRM

Start Depth 6'-0"

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 6'-3"

Sampling Equip BACKHOE / ALUM TRAY

Sample Matrix SOIL

QC Partners:

(TB) _____ (EB) _____ (FB) _____

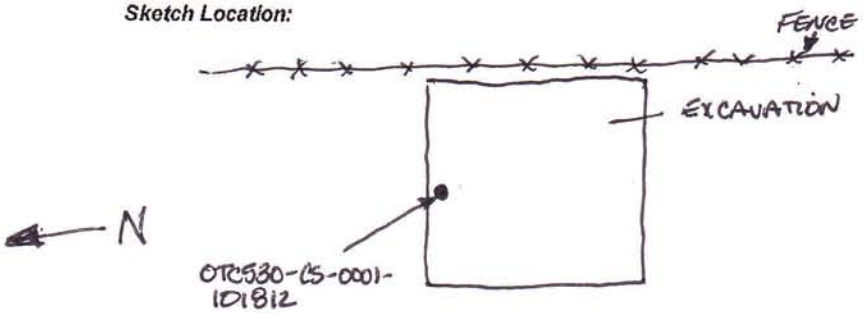
Sample Team TH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: Confirmation Sample (under abandoned tank). Could not sample directly under tank bottom or 5' bgs due to water table being @ 6'-5" bgs. Sampled dry soil to the North just above water line. Tank Bottom @ 8' bgs.

Sketch Location:



OTC530-CON1

Shaw Logged By / Dat 10/18/12 Reviewed By / Dat _____

Sample Collection Log

Bldg #308

Shaw: a world of Solutions

- Holloman AFB

Manager Christopher Long

Location Code [redacted] OTC930 OTC530-CON2

RFA / COC Number 144106 H065

Sample Number [redacted] OTC530-CS0002-101812

Task 144106 - JM 20000

Sample Name [redacted] OTC530-2-OTC530-CS0002-101812-Z

Collection Date 10/18/12

Sampling Method [redacted] BACKHOE

Sample Type [redacted] GRAB

Collection Time 15:45

Start Depth 6'-0"

Sample Purpose [redacted] CONFIRM

End Depth 6'-3"

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip BACKHOE / ALUM TRAY

Sample Matrix SOIL

QC Partners:

(TB) _____ (EB) _____ (FB) _____

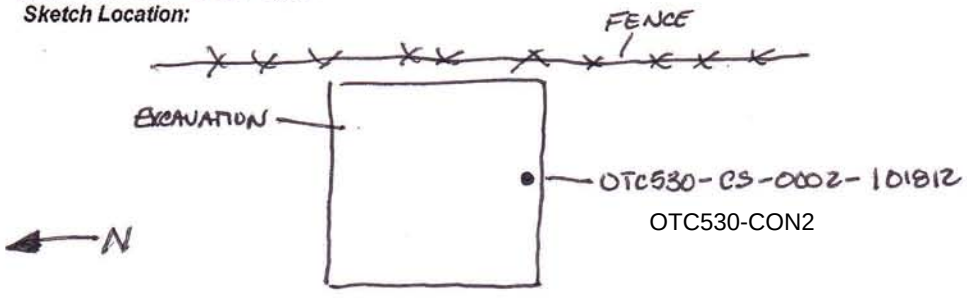
SampleTeam TH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: Confirmation Sample (Below abandoned tank) could not sample directly under former tank bottom or the 8' [redacted] below tank bottom due to the water table being @ 6'5" bgs. Sampled dry soil the South just above water line. Tank bottom @ 8' bgs.

Sketch Location:



Shaw Logged By / Dat [redacted] 10/18/12 Reviewed By / Dat _____

Sample Collection Log

MW-01

- Holloman AFB

Shaw Environmental & Infrastructure Solutions

Manager **Christopher Long**

Location Code **OTC530**

RFA / COC Number 144106-HO-59

Sample Number **OTC530-GW-5301-MMDDYY**

Task

Sample Name **OTC530-z-OTC530-GW-5301-MMDDYY-z**

Collection Date 10-3-12

Collection Time 0902

Sampling Method **Unknown**

Sample Type **Unknown**

Start Depth 6.39

Sample Purpose **Unknown**

End Depth 7.25

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sampling Equip YSI #36920 / BLADDER PUMP

Sample Matrix **GROUND WATER**

QC Partners:

(TB) OTC-TB10-100312 *(EB)* OTC RB9-100312 *(FB)* _____

SampleTeam J. Belmont

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SW8015B : GRO	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	C	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
~~SW8015B : ORO~~	~~D~~	~~Unknown~~	~~0~~	~~1~~	~~L~~	1 Liter Amber Glass	H2SO4
SW8015B : DRO	D	Unknown	2	1	L	1 Liter Amber Glass	H2SO4
PCBs by SW8082A	E	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Explosives by SW8330A	F	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Tritium by 906.0 Mod	G	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
~~Mercury by SW7470A~~	~~H~~	~~Unknown~~	~~0~~	~~500~~	~~ML~~	500 ml Poly Container	HNO3
~~Metals by SW6020A~~	~~H~~	~~Unknown~~	~~0~~	~~500~~	~~ML~~	500 ml Poly Container	HNO3
Metals by SW6010C	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
Total CN water by 335.4	I	Unknown	1	500	ML	500 ml Poly Container	NaOH
TDS by 160.1	J	Unknown	1	500	ML	500 ml Poly Container	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* J. Ruiz 10-3-12 *Reviewed By / Dat* _____

Sample Collection Log

Page: ~~19 of 49~~ 1/1

Shaw Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code ~~FIELDQC~~ IDW

RFA / COC Number HO 38

Sample Number ~~OTC644-GW-0441-MMDDYY-FD~~ LDY-IDWD1-090412

Sample Name ~~FIELDQC-2-OTC644-GW-0441-MMDDYY-FD-z~~

Task

Collection Date 09/04/2012

Sampling Method ~~Unknown~~ Composite

Sample Type ~~Unknown~~ Soil

Collection Time 1330

Sample Purpose ~~Unknown~~ IDW characterization

Start Depth NA

QC Code ~~FIELD DUPLICATE~~ NA

End Depth NA

Sampling Equip Stainless steel Trowel/Bowl/Aluminum

Sample Matrix ~~GROUND WATER~~ IDW Soil

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam LaThom, Hodu

Containers:

	Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
1)	VOCs by SW8260C TCLP VOCs	A	Unknown	~~3~~ 1	~~40~~ 8oz	~~ML~~	~~40 ml VOA Vials~~ Glass	~~HCL~~ Cool to 4°C
	~~SW8015B : GRO~~	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
2)	SVOCs by SW8270D TCLP SVOCs / other organics	EB	Unknown	~~2~~ 1	8	x oz	~~1 Liter Amber Glass~~ Glass	Cool to 4°
	~~SW8015B : GRO~~	B	Unknown	0	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~SW8015B : DRO~~	B	Unknown	2	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~PCBs by SW8082A~~ ~~TCLP~~	E	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
	~~Explosives by SW8330A~~	F	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
3)	~~Tritium by 906.0 Mod~~ RCI	C	Unknown	~~2~~ 1	~~1~~ 8oz		~~1 Liter Amber Glass~~ Glass	~~Cool to 4°C~~ Cool to 4°C
4)	Mercury by SW7470A TCLP Mercury	~~F~~ D	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~ oz	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
5)	Metals by SW6020A TCLP Metals	~~H~~ E	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
	~~Metals by SW6010C~~	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
	~~Total CN water by 335.4~~	I	Unknown	1	500	ML	~~500 ml Poly Container~~	NaOH
	~~TDS by 160.1~~	J	Unknown	1	500	ML	500 ml Poly Container	~~Cool to 4°~~

Comments: Composite Soil sample for TCLP analyses of IDW cuttings rolloff at Lay down Yard, 09/04/12

Sketch Location: Rolloff box Composite Sample @ Lay down Yard.

Analyses: TCLP VOCs, TCLP SVOCs, TCLP metals, TCLP Mercury, RCI

LDY = Lay down Yard

~~Shaw~~ *Logged By / Dat* Mel Hall *Reviewed By / Dat* _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code BULK WATER TANK

RFA / COC Number 144106 H070

Sample Number HAFB-IDW-BULK WATER-0001-111612

Task 144106.JM20000

Sample Name HAFB-IDW-BULK WATER-0001-111612

Collection Date 11/16/12

Sampling Method BAILER

Sample Type GRAB

Collection Time 13:00

Sample Purpose CONFIRM IDW

Start Depth N/A

QC Code

End Depth N/A

Sampling Equip DISPOSABLE BAILER

Sample Matrix **WATER**

QC Partners:

(TB) (EB) (FB)

SampleTeam JH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	B	Unknown	4	8	8OZ	Amber Glass	Cool to 4°
SW8015 : ORO	C	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015 : DRO	C	Unknown	1	1	L	1 Liter Amber Glass	H2SO4
Metals by SW6020A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
METALS by SW6020A	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Mercury by SW7470A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Metals by SW6010C	D	Unknown	1	500	ML	500 ml Poly Container	HNO3
	E		1	500	ML	500 ml Poly Cont	Cool to 4°
SW8015 : GRO	F	Unknown	3	40	ML	40 ml VOA Vials	HCL

Comments: SAMPLE COLLECTED FROM BULK WATER STORAGE TANK AFTER ALL WATER DRUMS WERE CONSOLIDATED. SENT BOTH A PRESERVED AND UNPRESERVED 500ML POLY FOR METALS. SPOKE WITH LAB AND THEY SAID TO SEND UNPRESERVED, BUT I THINK MAYBE THEY MADE A MISTAKE.

Sketch Location:

Shaw Logged By / Dat

Reviewed By / Dat

Appendix E
Boring Logs

Boring ID: OT-C530-Station 1

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 308

Date Completed: 7/17/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Ground Elevation AMSL (ft):4084.67
Y Coordinate: 672369.6116
X Coordinate: 1692275.9995

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		ASPHALT; 2" thick over 3 - 4" thick gravel fill.		Hand auger from 0 - 5 ft after drilling with star bit through asphalt. Began drilling on 7/17/12.
					SILT (ML); light to medium brown; moist; soft; clayey; trace very fine sand.	ML	
5		OTC530-IS-0001-071712 and OTC530-IS-0002-071712-FD	NR		▽		Wet zone @ 5 - 7 ft.
					Clayey SAND (SC); tan to greenish gray; wet.	SC	
10					Lean CLAY (CL); light gray; moist; low plasticity; silty.	CL	
		OTC530-IS-0003-071712	NR				
					SILT (ML); reddish brown; dry; firm; clayey; trace sand.	ML	
15			NR		Lean CLAY (CL); white; dry; firm; low plasticity.	CL	Total depth = 15 ft. Reached total depth on 7/17/12.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:44 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C530-Station 2

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 308

Date Completed: 7/17/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Ground Elevation AMSL (ft):4084.79
Y Coordinate: 672372.2409
X Coordinate: 1692284.1222

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		ASPHALT; 2" over 3" of gravel fill.		Hand auger from 0 - 5 ft after drilling with star bit through asphalt. Began drilling on 7/17/12.
					SILT (ML); medium brown to mottled white; moist; soft; clayey; trace sand.	ML	
5			NR		Clayey SAND (SC); reddish brown; wet; loose; trace silt.	SC	Wet zone @ 5 - 7.5 ft.
		OTC530-IS-0004-071712			Lean CLAY (CL); light gray; moist; firm; silty.	CL	
10			NR		Clayey SAND (SC); reddish brown; moist; firm.	SC	
15		OTC530-IS-0005-071712	NR		Lean CLAY (CL); white to light gray; hard; silty. Note: gypsum crystals.	CL	
					Clayey SAND (SC); light gray to light brown; moist to wet; fine sand.	SC	2" wet zone @ 18.5 ft.
20			NR				Total depth = 20 ft. Reached total depth on 7/17/12.
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:44 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OTC530-MW01

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 308

Date Completed: 8/29/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Top of PVC Riser Pipe AMSL (ft): 4084.49
Y Coordinate: 672368.3690
X Coordinate: 1692281.6949

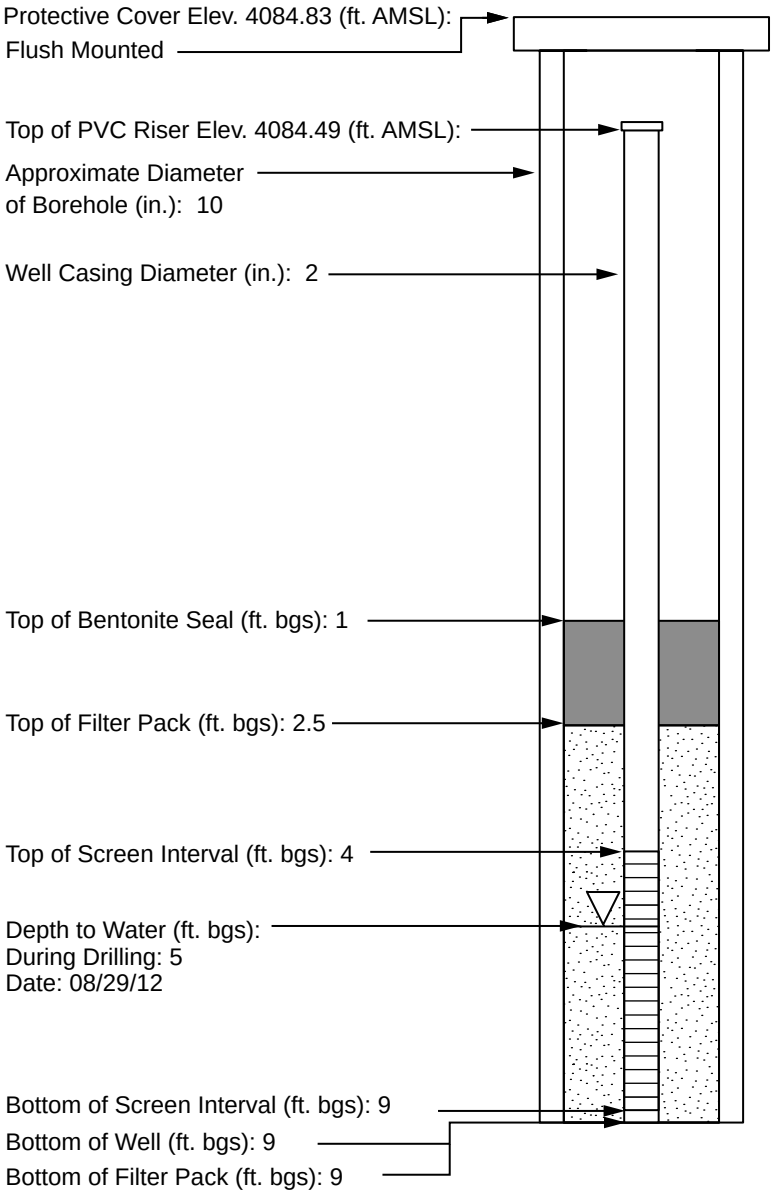
Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		Asphalt from 0 - 0.5 ft.		Hand auger from 0 - 5 ft. Began drilling @ 0900 on 8/29/12.
		OTC530-IS-0006-082912			FILL; silty clay and gravel.		
					Well graded SAND with Clay (SW-SC); yellowish red (5YR 4/6); moist; loose; fine sand; no odor.	SW-SC	
5		OTC530-IS-0007-082912	NR		▽ Same as above (1 ft); white (2.5YR); dry to moist; dense.		Wet @ 5 - 8.5 ft.
					Lean CLAY (CL); white (2.5YR); dry to moist; firm.	CL	
10					Same as above (7 ft); red.		
		OTC530-IS-0008-082912	NR		Well graded SAND with Clay (SW-SC); mottled reddish brown; dry; fine gravel. Note: caliche and trace gypsum.	SW-SC	
15			NR				Total depth = 15 ft. Reached total depth @ 0940 on 8/29/12.
20							
25							
30							

Appendix F
Well Construction Diagrams

Well Construction Diagram

Project: Holloman AFB
Location: OT-C530
Client: USAF
Subcontractor: Major Drilling
Driller: K. Burkhead
Drilling Method/Rig Type: DPT/Auger
Shaw Field Representative: M. Hardner

Well Number: OTC530-MW01
Site Location: Building 308
Installation Date: 08/29/2012
Completion Date: 08/29/2012
Grid Northing: 672368.3690
Grid Easting: 1692281.6949
NAD: 83 SPCS NM Central
NAVD: 88



Not To Scale

Protective Casing: Circular
Type: Flush Mount
Dimensions (in.): 8
Length (in): 10
Guard Post: NA

Ground Seal (Surface pad):
Dimensions (ft.): 2 x 2
Type: Concrete

Annular Space Seal:
Type: Quikcrete and Quikgel Bentonite
Installation: Gravity

Bentonite Seal:
Manufacturer: Enviro Plug
# of Bags: 2/3 (50 lbs)
Type: 3/8" Pellets
Installation: Gravity
Hydration time (hrs): 1

Filter Pack Material:
Manufacturer: DSI
Product Name: Well Gravel Pack
Size: GP#3
# of bags: 4 (50 lbs each)
Installation: Gravity

Well Casing Used (ft.):
Manufacturer: Silverline
Type: PVC Schedule 40
Diameter (in.): 2

Well Screen Casing:
Manufacturer: DSI
Type: 2" Pre-pack w/ vf SS Mesh w/ 1A Sand
Slot Size (in.): 0.010
Slot Type: Factory

Sump/End Cap (in.): 4 (PVC)
Backfill Material: NA

Appendix G
Well Purge Records

Shaw® Shaw E & I

EXAMPLE
WELL PURGE RECORD

Project Name: Holloman AFB / Midwest

Location: OTC 530-GW-5301-10012

Well/Piez. No.: MW01

Personnel: J. Baldwin

Date Installed: _____

Date (Start/End): 10-3-12

Csg. Diameter (I.D.): 2"

Method of ~~Development:~~ Sampling

Total Depth (ft. TOC): 8.62

☐ Surging ☐ Bailing ☒ Pumping ☐ Other (State Method) _____

☐ Original Development ☐ Redevelopment Development Date: _____

Depth to water before developing well: 6.39

		Volume (V)		Purge Factor		Volume To Purge
Height of Water Column: _____	feet _____	= _____	gal.*	_____	=	_____

$V = (B * r_c^2 * L_c * 7.48) + (B*(r_w - r_c)^2 * L_s * \phi_s * 7.48) =$ _____ gallons (See Notes below)

Depth purging from: 8.0 feet

Time purging begins: 0823

Weather: Clear 65°

Screened Interval (ft. BGL): _____

Equipment Nos.: pH Meter YSI 36920 EC Meter YSI 36920 Turbidity Meter YSI 36920

Equipment decontaminated prior to development Y X N _____

Describe _____

Date	Time	Water Level (ft. below TOC)	Volume Removed (gal.)	Temp (C or F)	pH	~~EC~~ Cond	Turbidity	D.O.	~~Comments~~ ORP	TDS
10-3-12	0826	6.69		23.94	6.21	4.491	132.2	6.96	226.0	2.881
	0831	7.00		25.56	6.44	4.211	-1.7	3.93	206.2	2.736
	0836	7.03		25.60	6.45	4.209	-3.9	3.61	194.4	2.735
	0841	7.04		25.56	6.45	4.205	-5.4	3.33	180.9	2.733
	0846	7.03		25.60	6.46	4.181	-6.3	3.15	164.3	2.716
	0851	7.04		25.60	6.46	4.171	-6.6	3.08	156.6	2.712
	0856	7.03		25.57	6.46	4.167	-6.9	2.96	141.9	2.708
	0901	7.02		25.60	6.46	4.168	-7.1	2.92	131.6	2.710

Notes:

- Water levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to 0.1 pH units
- Electrical conductivity (EC) – Reported to the nearest 10% mhos/cm or
- µmho/cm @25 C or in mS/cm of instrument set range
- Water temperature – Reported to the nearest 0.1 C or F feet
- Dissolved oxygen (D.O.) report in 0.1 mg/L
- Turbidity report in NTV nearest whole #

Where:

B=3.14

ϕ_s=porosity of the sand pack

r_c =radius of the well casing and screen in feet

L_c=length of water column inside the casing and screen in

r_w =radius of the well bore in feet

L_s =length of saturated portion of the sand pack in feet

7.48 gallons/cubic foot=conversion from cubic feet to gallons

Appendix H
Site Survey Data

Revised Rpt
09/11/2013
(re: TU/US-C513)
p. 7 of 10

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	682987.8550	1687022.9920	4098.16	BASE	682789.9107	1686534.0572
2	678390.1010	1678735.5020	4064.77	CP-52-P-19	678193.4892	1678248.9690
3	683252.1480	1680789.5360	4078.80	CP-55-JACK	683054.1271	1680302.4077
4	681667.1260	1694574.3780	4140.57	CP-56-AIR	681469.5645	1694083.2546
5	669733.4460	1682234.2110	4048.59	HAFB-07-07	669539.3431	1681746.6640
6	669695.2030	1718768.4150	4157.95	ALAMOAIR	669501.1112	1718270.2797
7	674362.7100	1713591.4300	4160.17	F248	674167.2655	1713094.7951
8	676850.6600	1718114.2590	4193.99	E-248	676654.4944	1717616.3133
50	691964.7620	1687201.2770	4140.90	MALONE	691764.2160	1686712.2905
51	662077.1700	1670356.4250	4077.10	BATE	661885.2861	1669872.3205
52	678390.1080	1678735.5040	4066.10	P 19	678193.4962	1678248.9710
53	644127.0780	1700529.8000	4039.00	MONT	643940.3964	1700036.9506
54	676850.6920	1718114.2670	4193.99	E 248	676654.5264	1717616.3213
55	683252.1970	1680789.5390	4080.20	JACK	683054.1761	1680302.4107
56	681667.0380	1694574.3640	4141.20	AIR	681469.4765	1694083.2406
82	678193.4999	1678248.9801	4064.92	P	677996.9451	1677762.5882
84	676654.5300	1717616.3305	4192.77	E	676458.4212	1717118.5291
85	683054.1798	1680302.4198	4079.02	JACK	682856.2163	1679815.4327
86	681469.4802	1694083.2497	4140.00	AIR	681271.9760	1693592.2686
100	685975.0760	1686614.9100	4101.87	OT-C534-PVC	685776.2660	1686126.0934
101	685975.4260	1686614.8310	4102.28	OT-C534-CASING	685776.6159	1686126.0145
102	685952.4860	1686626.9650	4101.89	OT-C534-W2-PVC	685753.6825	1686138.1449
103	685952.6870	1686626.9300	4102.33	OT-C534-W2-CASING	685753.8834	1686138.1099
104	685939.9110	1686581.7340	4101.89	OT-C534-W1-CASING	685741.1111	1686092.9270
105	685939.6450	1686581.7790	4101.57	OT-C534-W1-PVC	685740.8452	1686092.9720
106	685924.3640	1686619.9800	4101.81	OT-C534-W4-PVC	685725.5687	1686131.1620
107	685924.6590	1686619.8790	4102.23	OT-C534-W4-CASING	685725.8636	1686131.0610
108	685934.1180	1686578.3320	4101.72	OT-C534-LEACH-NG	685735.3198	1686089.5260
109	685935.7830	1686600.7340	4101.88	OT-C534-LEACH-NG	685736.9843	1686111.9215
110	685938.2680	1686607.0980	4101.88	OT-C534-LEACH-NG	685739.4686	1686118.2837
111	685951.4240	1686604.4600	4101.90	OT-C534-LEACH-NG	685752.6208	1686115.6465
112	685953.8200	1686601.1380	4101.88	OT-C534-LEACH-NG	685755.0161	1686112.3254
113	685953.2500	1686596.8650	4101.88	OT-C534-LEACH-NG	685754.4463	1686108.0537
114	685946.2830	1686578.3790	4101.81	OT-C534-LEACH-NG	685747.4813	1686089.5730
115	685945.3070	1686576.3400	4101.88	OT-C534-LEACH-NG	685746.5056	1686087.5346
116	685940.6850	1686575.6580	4101.79	OT-C534-LEACH-NG	685741.8849	1686086.8528
117	685952.3510	1686614.8200	4102.03	OT-C534-LEACH-NG	685753.5475	1686126.0035
118	685953.0040	1686623.0300	4102.13	OT-C534-LEACH-NG	685754.2004	1686134.2111
119	685945.6920	1686623.1960	4102.03	OT-C534-LEACH-NG	685746.8905	1686134.3770
120	685944.8810	1686615.5440	4101.97	OT-C534-LEACH-NG	685746.0797	1686126.7272
121	685948.0570	1686615.1700	4101.97	OT-C534-FLINE-NG	685749.2548	1686126.3534
122	685947.7680	1686606.3420	4101.81	OT-C534-FLINE-NG	685748.9659	1686117.5279
123	685953.2050	1686618.0690	4102.08	OT-C534-ENFLU-NG	685754.4013	1686129.2515
124	685968.5800	1686611.5870	4102.06	OT-C534-ENFLU-NG	685769.7718	1686122.7714
125	686021.5760	1686604.3860	4102.49	OT-C534-ENFLU-NG	685822.7525	1686115.5725
126	686051.0660	1686600.5520	4102.82	OT-C534-ENFLU-NG	685852.2339	1686111.7396
127	682943.9250	1686529.5770	4094.74	OT-C536-STATION1-NG	682745.9934	1686040.7852
128	682925.1900	1686534.9010	4094.63	OT-C536-STATION2-NG	682727.2639	1686046.1076
129	682914.0740	1686530.8350	4094.17	OT-C536-STATION3-NG	682716.1511	1686042.0428
130	682900.2750	1686534.1950	4094.40	MW-OT-C5361-CASING	682702.3561	1686045.4018
131	682900.0410	1686534.2560	4094.03	MW-OT-C5361-PVC	682702.1222	1686045.4628
132	682892.0960	1686514.3610	4094.08	OT-C536-LEACH-NG	682694.1795	1686025.5736
133	682905.9860	1686504.4840	4093.98	OT-C536-LEACH-NG	682708.0654	1686015.6994
134	682914.9460	1686505.2970	4094.10	OT-C536-LEACH-NG	682717.0228	1686016.5122
135	682919.4610	1686521.1490	4094.40	OT-C536-LEACH-NG	682721.5365	1686032.3596
136	682921.1340	1686534.7310	4094.42	OT-C536-LEACH-NG	682723.2091	1686045.9377
137	682919.5910	1686545.0230	4094.72	OT-C536-LEACH-NG	682721.6665	1686056.2267
138	682912.1700	1686551.2270	4094.60	OT-C536-LEACH-NG	682714.2477	1686062.4289
139	682897.7180	1686551.9240	4094.16	OT-C536-LEACH-NG	682699.7998	1686063.1257
140	682892.5110	1686549.8820	4094.18	OT-C536-LEACH-NG	682694.5943	1686061.0843
141	682922.3680	1686533.4440	4094.42	OT-C536-TANKPIT-NG	682724.4427	1686044.6510
142	682920.9800	1686525.5880	4094.39	OT-C536-TANKPIT-NG	682723.0551	1686036.7973
143	682928.0220	1686524.4280	4094.63	OT-C536-TANKPIT-NG	682730.0951	1686035.6377
144	682929.2370	1686532.7090	4094.62	OT-C536-TANKPIT-NG	682731.3097	1686043.9163
145	682949.7020	1686528.9800	4094.75	OT-C536-ENFLU-NG	682751.7688	1686040.1883
146	682921.2900	1686528.9090	4094.41	OT-C536-ENFLU-NG	682723.3650	1686040.1174
147	682916.2970	1686530.1310	4094.27	OT-C536-ENFLU-NG	682718.3735	1686041.3390
148	682877.6850	1686739.3620	4095.03	OT-C533-MW-CASING	682679.7726	1686250.5094
149	682877.4490	1686739.4350	4094.68	OT-C533-MW-PVC	682679.5367	1686250.5823
150	682884.2550	1686735.8390	4094.76	OT-C533-LEACH-NG	682686.3407	1686246.9874
151	682877.4700	1686734.1690	4094.84	OT-C533-LEACH-NG	682679.5577	1686245.3179

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
152	682871.6400	1686736.6530	4094.83	OT-C533-LEACH-NG	682673.7294	1686247.8011
153	682869.4200	1686738.9370	4094.89	OT-C533-LEACH-NG	682671.5100	1686250.0845
154	682868.8760	1686741.4810	4094.99	OT-C533-LEACH-NG	682670.9662	1686252.6277
155	682867.8710	1686756.1100	4095.03	OT-C533-LEACH-NG	682669.9615	1686267.2525
156	682857.6950	1686766.0680	4095.35	OT-C533-LEACH-NG	682659.7884	1686277.2076
157	682855.8760	1686772.9280	4095.39	OT-C533-LEACH-NG	682657.9700	1686284.0656
158	682855.6590	1686783.4130	4095.46	OT-C533-LEACH-NG	682657.7530	1686294.5476
159	682855.5230	1686790.0690	4095.47	OT-C533-LEACH-NG	682657.6171	1686301.2017
160	682857.2270	1686794.8730	4095.42	OT-C533-LEACH-NG	682659.3206	1686306.0043
161	682858.6900	1686813.7880	4095.55	OT-C533-LEACH-NG	682660.7832	1686324.9138
162	682867.9360	1686816.7350	4095.32	OT-C533-LEACH-NG	682670.0265	1686327.8599
163	682880.0660	1686814.6740	4095.00	OT-C533-LEACH-NG	682682.1530	1686325.7995
164	682891.9700	1686818.7840	4094.82	OT-C533-LEACH-NG	682694.0535	1686329.9083
165	682901.1340	1686806.7570	4094.86	OT-C533-LEACH-NG	682703.2148	1686317.8848
166	682889.7110	1686785.0140	4094.98	OT-C533-LEACH-NG	682691.7952	1686296.1481
167	682889.3190	1686757.8750	4094.96	OT-C533-LEACH-NG	682691.4033	1686269.0170
168	682886.6550	1686745.7080	4094.83	OT-C533-LEACH-NG	682688.7400	1686256.8535
169	682895.8900	1686814.7130	4095.19	OT-C533-FFLUEN-NG	682697.9724	1686325.8385
170	682901.8890	1686814.2530	4095.86	OT-C533-FFLUEN-TPAD	682703.9696	1686325.3787
171	682901.5970	1686811.8220	4095.84	OT-C533-SEPTIC-TCONC	682703.6777	1686322.9484
172	682911.5820	1686810.3750	4095.77	OT-C533-SEPTIC-TCONC	682713.6598	1686321.5018
173	682912.4280	1686815.4170	4095.77	OT-C533-SEPTIC-TCONC	682714.5056	1686326.5423
174	682902.3730	1686816.8390	4095.84	OT-C533-SEPTIC-TCONC	682704.4535	1686327.9639
175	682912.0910	1686812.7560	4095.77	OT-C533-EFLUEN-TCONC	682714.1687	1686323.8821
176	682923.3600	1686810.9450	4095.29	OT-C533-EFLUEN-NG	682725.4344	1686322.0716
177	682942.2940	1686810.3140	4095.49	OT-C533-EFLUEN-NG	682744.3629	1686321.4408
178	682937.5080	1686805.9000	4095.30	OT-C533-STATION1-NG	682739.5783	1686318.0278
179	682906.2780	1686808.8380	4094.86	OT-C533-STATION2-NG	682708.3574	1686319.9652
180	682895.2770	1686813.2080	4094.98	OT-C533-STATION3-NG	682697.3595	1686324.3340
181	700191.9570	1695605.3730	4181.72	OT-C540-STATION1-ASP	699989.0266	1695113.9508
182	700173.9260	1695611.2520	4181.82	OT-C540-STATION2-NG	699971.0008	1695119.8281
183	700168.8930	1695604.5390	4181.39	OT-C540-STATION3-NG	699965.9693	1695113.1170
184	700151.2700	1695598.6630	4180.49	OT-C540-STATION4-NG	699948.3514	1695107.2427
185	700158.9630	1695593.9090	4180.86	OT-C540-LEACH-NG	699956.0422	1695102.4901
186	700150.2560	1695603.0840	4180.78	OT-C540-LEACH-NG	699947.3377	1695111.6625
187	700152.8330	1695609.6400	4180.81	OT-C540-LEACH-NG	699949.9139	1695118.2166
188	700155.1660	1695611.7200	4180.89	OT-C540-LEACH-NG	699952.2463	1695120.2960
189	700161.1020	1695611.3470	4181.11	OT-C540-LEACH-NG	699958.1805	1695119.9231
190	700163.7200	1695601.1600	4181.06	OT-C540-LEACH-NG	699960.7978	1695109.7390
191	700161.5790	1695596.1920	4181.05	OT-C540-LEACH-NG	699958.6574	1695104.7725
192	700165.7400	1695603.7570	4181.48	OT-C540-FFLUEN-NG	699962.8172	1695112.3353
193	700170.8520	1695608.8530	4181.93	OT-C540-FFLUEN-NG	699967.9277	1695117.4298
194	700170.7290	1695606.7600	4182.01	OT-C540-SEPTIC-NG	699967.8048	1695115.3374
195	700176.8760	1695605.4490	4181.91	OT-C540-SEPTIC-NG	699973.9500	1695114.0268
196	700177.5910	1695612.4300	4181.92	OT-C540-SEPTIC-NG	699974.6648	1695121.0058
197	700172.1930	1695613.9030	4182.05	OT-C540-SEPTIC-NG	699969.2683	1695122.4783
198	700177.7030	1695608.9790	4181.69	OT-C540-EFLUEN-NG	699974.7767	1695117.5558
199	700205.8220	1695608.1850	4181.85	OT-C540-EFLUEN-ASPH	700002.8876	1695116.7620
200	700246.4300	1695613.4690	4182.95	OT-C540-EFLUEN-ASPH	700043.4838	1695122.0445
201	700238.4930	1695614.0360	4182.51	OT-C540-BLDGCOR	700035.5491	1695122.6113
202	700228.4390	1695608.1640	4182.55	OT-C540-BLDGCOR	700025.4980	1695116.7410
203	700227.0510	1695568.0300	4182.87	OT-C540-BLDGCOR	700024.1104	1695076.6186
204	700236.9380	1695557.6950	4183.02	OT-C540-BLDGCOR	700033.9946	1695066.2866
205	688305.7410	1690609.5510	4126.46	TU\US-C507-STATION1-	688106.2555	1690119.5767
206	688309.7220	1690614.0760	4126.51	TU\US-C507-STATION2-	688110.2353	1690124.1004
207	688306.7130	1690619.4150	4126.45	TU\US-C507-STATION3-	688107.2272	1690129.4378
208	688313.7000	1690621.8280	4126.37	TU\US-C507-STATION4-	688114.2122	1690131.8501
209	688313.7950	1690607.6410	4126.36	TU\US-C507-STATION5-	688114.3071	1690117.6673
210	688304.0140	1690620.9730	4126.47	TU\US-C507-USTPIT-AS	688104.5290	1690130.9954
211	688304.3040	1690607.3010	4126.54	TU\US-C507-USTPIT-AS	688104.8189	1690117.3274
212	688317.4320	1690607.1780	4126.54	TU\US-C507-USTPIT-AS	688117.9431	1690117.2044
213	688317.6000	1690622.2860	4126.57	TU\US-C507-USTPIT-AS	688118.1110	1690132.3080
214	688320.7590	1690623.9670	4127.18	TU\US-C507-BLDGCOR	688121.2691	1690133.9885
215	688330.7630	1690627.7570	4125.65	TU\US-C507-BLDGCOR	688131.2702	1690137.7774
216	688318.5520	1690598.7120	4126.71	TU\US-C507-BLDGCOR	688119.0628	1690108.7408
217	688306.5580	1690598.9520	4126.69	TU\US-C507-BLDGCOR	688107.0722	1690108.9808
218	688287.5740	1690592.3200	4126.83	TU\US-C507-EXMW1	688088.0937	1690102.3507
219	688287.4600	1690625.9270	4126.36	TU\US-C507-EXMW2	688087.9798	1690135.9480
220	689216.8690	1680453.8850	4087.76	TU\US-C501-STATION4-	689017.1194	1679966.8540
221	689203.4000	1680450.4300	4087.80	TU\US-C501-STATION1-	689003.6543	1679963.4000
222	689227.9170	1680449.2880	4087.78	TU\US-C501-STATION2-	689028.1642	1679962.2584

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
223	689201.2820	1680437.6020	4087.96	TU\US-C501-STATION3-	689001.5369	1679950.5757
224	689204.0090	1680426.7550	4087.80	TU\US-C501-STATION5-	689004.2631	1679939.7319
225	689200.5240	1680440.6650	4087.95	TU\US-C501-BLDGCOR-N	689000.7792	1679953.6379
226	689191.1430	1680432.8740	4088.07	TU\US-C501-BLDGCOR-N	688991.4009	1679945.8491
227	689202.0960	1680449.8730	4087.79	TU\US-C501-TANKPIT-N	689002.3507	1679962.8432
228	689201.5860	1680440.8210	4087.99	TU\US-C501-TANKPIT-N	689001.8408	1679953.7938
229	689191.7450	1680432.9310	4088.07	TU\US-C501-TANKPIT-N	688992.0027	1679945.9061
230	689195.4710	1680423.1750	4087.88	TU\US-C501-TANKPIT-N	688995.7276	1679936.1529
231	689207.1960	1680422.4490	4087.92	TU\US-C501-TANKPIT-N	689007.4492	1679935.4271
232	689229.2900	1680431.3210	4087.77	TU\US-C501-TANKPIT-N	689029.5368	1679944.2966
233	689231.6150	1680444.1310	4087.67	TU\US-C501-TANKPIT-N	689031.8611	1679957.1029
234	689227.5450	1680454.7320	4087.83	TU\US-C501-TANKPIT-N	689027.7923	1679967.7008
235	689218.0540	1680463.3780	4088.03	TU\US-C501-TANKPIT-N	689018.3041	1679976.3443
236	689209.0460	1680458.6260	4087.92	TU\US-C501-TANKPIT-N	689009.2987	1679971.5937
237	689237.1630	1680445.1670	4087.64	TU\US-C501-COMMLINE-	689037.4075	1679958.1386
238	689219.6050	1680436.9770	4088.00	TU\US-C501-COMMLINE-	689019.8546	1679949.9509
239	689199.7540	1680431.6770	4088.06	TU\US-C501-COMMLINE-	689000.0094	1679944.6525
240	689181.3550	1680425.0490	4088.20	TU\US-C501-COMMLINE-	688981.6157	1679938.0264
241	689162.6180	1680417.3900	4088.35	TU\US-C501-COMMLINE-	688962.8841	1679930.3696
242	689161.5970	1680417.5650	4088.56	TU\US-C501-COMMVAULT	688961.8634	1679930.5446
243	689157.8580	1680421.3400	4088.11	TU\US-C501-COMMVAULT	688958.1255	1679934.3185
244	689150.8680	1680414.5760	4088.10	TU\US-C501-COMMVAULT	688951.1375	1679927.5564
245	689154.6050	1680410.8830	4088.46	TU\US-C501-COMMVAULT	688954.8735	1679923.8645
246	687246.6430	1686873.0010	4105.82	OT-C535-STATION1-NG	687047.4644	1686384.1096
247	687270.5400	1686861.6690	4105.63	OT-C535-STATION2-NG	687071.3545	1686372.7809
248	687282.8340	1686866.7860	4105.85	OT-C535-STATION3-NG	687083.6449	1686377.8964
249	687303.5940	1686788.5490	4105.12	OT-C535-STATION4-NG	687104.3989	1686299.6821
250	687291.9640	1686793.7970	4105.27	OT-C535-LEACH-NG	687092.7723	1686304.9286
251	687304.7930	1686782.8770	4105.17	OT-C535-LEACH-NG	687105.5976	1686294.0117
252	687323.6740	1686798.1880	4105.34	OT-C535-LEACH-NG	687124.4731	1686309.3183
253	687319.7080	1686817.5380	4105.82	OT-C535-LEACH-NG	687120.5083	1686328.6627
254	687307.4400	1686838.9610	4105.76	OT-C535-LEACH-NG	687108.2438	1686350.0795
255	687297.0830	1686856.5380	4106.04	OT-C535-LEACH-NG	687097.8898	1686367.6514
256	687290.0540	1686837.9200	4105.59	OT-C535-LEACH-NG	687090.8628	1686349.0388
257	687291.3760	1686806.0200	4105.33	OT-C535-LEACH-NG	687092.1845	1686317.1480
258	687284.5890	1686864.5150	4106.11	OT-C535-FFLUEN-NG	687085.3994	1686375.6261
259	687276.8290	1686868.4490	4106.19	OT-C535-FFLUEN-NG	687077.6417	1686379.5589
260	687276.0820	1686870.8490	4106.28	OT-C535-SEPTIC-NG	687076.8949	1686381.9583
261	687263.3720	1686869.7190	4105.87	OT-C535-SEPTIC-NG	687064.1886	1686380.8286
262	687263.7200	1686863.5770	4105.95	OT-C535-SEPTIC-NG	687064.5365	1686374.6884
263	687276.4840	1686862.8870	4106.07	OT-C535-SEPTIC-NG	687077.2968	1686373.9986
264	687263.5270	1686868.1150	4105.92	OT-C535-EFLUEN-NG	687064.3435	1686379.2250
265	687228.9570	1686874.1570	4105.71	OT-C535-EFLUEN-NG	687029.7836	1686385.2653
266	687235.2230	1686881.4610	4106.05	OT-C535-BLDGCOR-NG	687036.0477	1686392.5672
267	687225.9150	1686892.3360	4105.90	OT-C535-BLDGCOR-NG	687026.7424	1686403.4390
268	687232.0250	1686844.5370	4105.92	OT-C535-BLDGCOR-NG	687032.8507	1686355.6539
269	687221.4890	1686835.3400	4105.63	OT-C535-BLDGCOR-NG	687022.3177	1686346.4595
270	677637.2460	1692755.6660	4110.24	TU/US-C505-MW1-CASIN	677440.8524	1692265.0697
271	677636.9990	1692755.6590	4109.84	TU/US-C505-MW1-PVC	677440.6055	1692265.0627
272	677634.4160	1692722.3930	4110.42	TU/US-C505-WELLATEMP	677438.0233	1692231.8064
273	677659.4620	1692742.2400	4110.34	TU/US-C505-WELLATEMP	677463.0620	1692251.6476
274	677701.9500	1692799.3200	4110.17	TU/US-C505-USTPIT-NG	677505.5377	1692308.7111
275	677701.3830	1692789.3010	4110.35	TU/US-C505-USTPIT-NG	677504.9708	1692298.6950
276	677711.5570	1692789.5280	4110.64	TU/US-C505-USTPIT-NG	677515.1419	1692298.9219
277	677710.8940	1692799.1130	4110.24	TU/US-C505-USTPIT-NG	677514.4791	1692308.5041
278	677707.4060	1692790.0820	4110.35	TU/US-C505-STATION1-	677510.9921	1692299.4757
279	677702.3100	1692795.0710	4110.20	TU/US-C505-STATION2-	677505.8976	1692304.4633
280	677705.6610	1692797.9500	4110.13	TU/US-C505-STATION3-	677509.2476	1692307.3415
281	677710.4770	1692793.8740	4110.09	TU/US-C505-STATION4-	677514.0622	1692303.2666
282	677706.4200	1692793.8350	4110.12	TU/US-C505-STATION5-	677510.0064	1692303.2276
283	677694.5060	1692779.7220	4110.88	TU/US-C505-BLDGCOR-N	677498.0958	1692289.1187
284	677704.1940	1692790.4680	4110.28	TU/US-C505-BLDGCOR-N	677507.7810	1692299.8616
285	677754.5670	1692783.0890	4110.79	TU/US-C505-BLDGCOR-N	677558.1394	1692292.4848
286	677743.8570	1692795.1680	4110.70	TU/US-C505-BLDGCOR-N	677547.4325	1692304.5603
287	686300.2320	1672933.0350	4060.98	OT-C542-MW-CASING-	686101.3277	1672448.1837
288	686300.2350	1672933.0550	4060.98	OT-C542-MW-PVC	686101.3307	1672448.2037
289	686274.4020	1672914.6520	4061.01	OT-C542-LEACH-NG	686075.5052	1672429.8061
290	686289.6710	1672938.5250	4060.76	OT-C542-LEACH-NG	686090.7698	1672453.6721
291	686294.6900	1672941.1720	4060.83	OT-C542-LEACH-NG	686095.7873	1672456.3184
292	686301.6970	1672938.9490	4060.85	OT-C542-LEACH-NG	686102.7923	1672454.0960
293	686305.7170	1672936.2850	4060.87	OT-C542-LEACH-NG	686106.8111	1672451.4328

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
294	686308.0670	1672931.0550	4060.89	OT-C542-LEACH-NG	686109.1604	1672446.2043
295	686304.8000	1672917.9090	4060.82	OT-C542-LEACH-NG	686105.8944	1672433.0621
296	686292.3740	1672901.2590	4060.90	OT-C542-LEACH-NG	686093.4720	1672416.4169
297	686283.4190	1672906.7050	4060.97	OT-C542-FFLUEN-NG	686084.5196	1672421.8614
298	686280.3770	1672902.6520	4060.94	OT-C542-FFLUEN-NG	686081.4785	1672417.8095
299	686276.9070	1672904.6420	4060.95	OT-C542-SEPTIC-NG	686078.0095	1672419.7990
300	686271.2980	1672896.9550	4060.80	OT-C542-SEPTIC-NG	686072.4021	1672412.1142
301	686281.9530	1672889.9350	4060.83	OT-C542-SEPTIC-NG	686083.0540	1672405.0962
302	686287.0950	1672896.6800	4060.88	OT-C542-SEPTIC-NG	686088.1945	1672411.8393
303	686285.7900	1672894.7150	4060.83	OT-C542-EFLUEN-NG	686086.8899	1672409.8748
304	686299.2270	1672887.1560	4060.87	OT-C542-EFLUEN-NG	686100.3230	1672402.3180
305	686310.9860	1672881.5880	4061.18	OT-C542-EFLUEN-NG	686112.0786	1672396.7516
306	686294.2970	1672858.0380	4060.90	OT-C542-BLDGCOR-NG	686095.3944	1672373.2085
307	686295.8820	1672844.1310	4061.28	OT-C542-BLDGCOR-NG	686096.9790	1672359.3055
308	686345.1390	1672922.4560	4060.89	OT-C542-BLDGCOR-NG	686146.2217	1672437.6078
309	686358.9780	1672924.0940	4061.42	OT-C542-BLDGCOR-NG	686160.0567	1672439.2453
310	686291.8860	1672885.1500	4060.65	OT-C542-STATION1-NG	686092.9841	1672400.3126
311	686275.2730	1672891.5340	4060.63	OT-C542-STATION2-NG	686076.3760	1672406.6948
312	686281.5390	1672904.6340	4060.73	OT-C542-STATION2-NG	686082.6401	1672419.7910
313	685750.1690	1671530.2910	4055.60	OT-C543-STATION2-NG	685551.4241	1671045.8463
314	685734.0730	1671548.8090	4055.84	OT-C543-STATION2	685535.3328	1671064.3589
315	685727.7350	1671514.3350	4055.33	OT-C543-STATION3	685528.9966	1671029.8949
316	685749.4390	1671546.6740	4055.91	OT-C543-EXSEPTIC	685550.6944	1671062.2245
317	685732.6430	1671545.5190	4055.74	OT-C543-EXSEPTIC	685533.9032	1671061.0699
318	685741.2600	1671557.0720	4056.32	OT-C543-EXSEPTIC	685542.5177	1671072.6195
319	685738.1510	1671537.7290	4055.62	OT-C543-EXSEPTIC	685539.4096	1671053.2821
320	685734.3520	1671541.2760	4055.65	OT-C543-FFLUEN	685535.6117	1671056.8281
321	685716.0920	1671515.5090	4055.04	OT-C543-FFLUEN	685517.3570	1671031.0686
322	685708.2650	1671520.5800	4055.23	OT-C543-LEACH	685509.5323	1671036.1381
323	685688.3040	1671512.0560	4055.52	OT-C543-LEACH	685489.5771	1671027.6166
324	685669.5610	1671502.3840	4055.36	OT-C543-LEACH	685470.8395	1671017.9474
325	685659.9210	1671495.2130	4055.04	OT-C543-LEACH	685461.2023	1671010.7784
326	685670.4020	1671495.5660	4055.43	OT-C543-MW-CASING	685471.6803	1671011.1313
327	685670.1370	1671495.6580	4055.13	OT-C543-MW-PVC	685471.4153	1671011.2233
328	685682.2550	1671485.7460	4055.16	OT-C543-LEACH	685483.5298	1671001.3142
329	685699.8070	1671491.2750	4054.76	OT-C543-LEACH	685501.0767	1671006.8416
330	685710.4840	1671499.0550	4055.06	OT-C543-LEACH	685511.7506	1671014.6193
331	685721.5030	1671508.4730	4055.40	OT-C543-LEACH	685522.7664	1671024.0346
332	685794.8190	1671498.3320	4056.84	OT-C543-EFLUEN	685596.0612	1671013.8965
333	685809.3600	1671495.0820	4059.27	OT-C543-BLDGCOR	685610.5980	1671010.6475
334	685776.9050	1671465.9090	4060.02	OT-C543-BLDGCOR	685578.1524	1670981.4829
335	685785.4230	1671455.8900	4060.26	OT-C543-BLDGCOR	685586.6679	1670971.4668
336	685744.8400	1671542.1950	4055.76	OT-C543-EFLUEN	685546.0967	1671057.7468
337	685303.6520	1671072.3550	4048.79	OT-C544-MW-CASING	685105.0365	1670588.0430
338	685303.3550	1671072.2840	4048.52	OT-C544-MW-PVC	685104.7396	1670587.9720
339	685349.4970	1671083.9730	4052.43	OT-C544-STATION1	685150.8683	1670599.6576
340	685342.4960	1671086.5980	4051.55	OT-C544-STATION1	685143.8693	1670602.2819
341	685336.0530	1671085.0120	4050.99	OT-C544-STATION1	685137.4282	1670600.6963
342	685336.7000	1671089.5480	4051.15	OT-C544-SEPTIC	685138.0750	1670605.2310
343	685338.4520	1671075.7050	4051.30	OT-C544-SEPTIC	685139.8265	1670591.3920
344	685347.8050	1671077.3720	4052.23	OT-C544-SEPTIC	685149.1768	1670593.0585
345	685345.6600	1671089.9410	4052.38	OT-C544-SEPTIC	685147.0324	1670605.6239
346	685356.1020	1671079.9660	4041.22	OT-C544-EFLUEN	685157.4713	1670595.6518
347	685347.2700	1671081.8770	4052.36	OT-C544-EFLUEN	685148.6419	1670597.5622
348	685337.4940	1671082.4320	4051.31	OT-C544-FFLUEN	685138.8687	1670598.1171
349	685335.1290	1671082.2690	4051.14	OT-C544-FFLUEN	685136.5044	1670597.9541
350	685336.2280	1671075.8560	4050.85	OT-C544-LEACH	685137.6031	1670591.5430
351	685323.3310	1671071.0830	4049.91	OT-C544-LEACH	685124.7098	1670586.7714
352	685297.8990	1671068.1360	4048.16	OT-C544-LEACH	685099.2852	1670583.8252
353	685296.9990	1671078.2660	4047.94	OT-C544-LEACH	685098.3855	1670593.9523
354	685317.0900	1671090.9580	4049.62	OT-C544-LEACH	685118.4707	1670606.6406
355	685334.6940	1671090.0750	4050.81	OT-C544-LEACH	685136.0696	1670605.7579
356	685360.4020	1671127.4140	4053.89	OT-C544-BLDGCOR	685161.7701	1670643.0860
357	685349.8450	1671114.5020	4052.32	OT-C544-BLDGCOR	685151.2162	1670630.1778
358	685360.3480	1671033.1240	4052.96	OT-C544-BLDGCOR	685161.7161	1670548.8234
359	685371.1230	1671022.2010	4053.70	OT-C544-BLDGCOR	685172.4880	1670537.9035
360	669828.5970	1693339.1960	4077.44	TU/US-C503-STATION1	669634.4665	1692848.4306
361	669823.8520	1693340.4930	4077.30	TU/US-C503-STATION2	669629.7229	1692849.7272
362	669816.1660	1693331.0930	4077.32	TU/US-C503-STATION3	669622.0391	1692840.3299
363	669804.9830	1693324.1990	4077.14	TU/US-C503-STATION5	669610.8594	1692833.4379
364	669830.2120	1693344.6950	4077.63	TU/US-C503-STATION4	669636.0811	1692853.9280

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
365	669820.3680	1693343.5050	4078.10	TU/US-C503-USTTANK	669626.2399	1692852.7383
366	669826.9160	1693337.2450	4077.78	TU/US-C503-USTTANK	669632.7860	1692846.4802
367	669831.7020	1693342.9300	4077.73	TU/US-C503-USTTANK	669637.5706	1692852.1635
368	669817.5060	1693300.2710	4077.28	TU/US-C503-BLDGCOR	669623.3788	1692809.5169
369	669817.0280	1693314.4610	4077.69	TU/US-C503-BLDGCOR	669622.9009	1692823.7028
370	669870.4630	1693326.6030	4077.24	TU/US-C503-BLDGCOR	669676.3204	1692835.8412
371	669857.6770	1693326.9550	4077.12	TU/US-C503-BLDGCOR	669663.5381	1692836.1931
372	669799.9830	1693280.8270	4076.53	TU/US-C503-BLDGCOR	669605.8608	1692790.0785
373	669786.0040	1693280.0690	4077.00	TU/US-C503-BLDGCOR	669591.8859	1692789.3207
374	669753.1970	1693299.5360	4076.55	TU/US-C503-MW1-CASIN	669559.0884	1692808.7821
375	669753.0160	1693299.6510	4076.22	TU/US-C503-MW1-PVC	669558.9075	1692808.8971
376	669717.9520	1693348.6000	4074.92	TU/US-C503-MW3-PVC	669523.8536	1692857.8319
377	669718.0930	1693348.2730	4075.65	TU/US-C503-MW3-CASIN	669523.9946	1692857.5050
378	669746.8950	1693329.2100	4076.92	TU/US-C503-BLDGCOR	669552.7882	1692838.4475
379	669747.5820	1693308.1150	4076.21	TU/US-C503-BLDGCOR	669553.4750	1692817.3586
380	669906.5180	1693361.1640	4077.43	TU/US-C503-MW2-CASIN	669712.3650	1692870.3922
381	669906.2520	1693361.2650	4077.07	TU/US-C503-MW2-PVC	669712.0990	1692870.4932
382	669887.0390	1693344.8910	4077.53	TU/US-C503-BLDGCOR	669692.8916	1692854.1239
383	669886.0230	1693359.0930	4077.99	TU/US-C503-BLDGCOR	669691.8759	1692868.3218
384	670862.3470	1691695.2520	4072.78	TU/US-C500-MW1-CASIN	670667.9169	1691204.9630
385	670862.1340	1691695.4850	4072.39	TU/US-C500-MW1-PVC	670667.7040	1691205.1960
386	670897.1420	1691671.0590	4072.25	TU/US-C500-MW2-PVC	670702.7019	1691180.7771
387	670897.3420	1691670.8340	4072.66	TU/US-C500-MW2-CASIN	670702.9018	1691180.5521
388	670997.2710	1691721.0890	4072.90	TU/US-C500-MW3-CASIN	670802.8018	1691230.7926
389	670996.9840	1691721.2540	4072.41	TU/US-C500-MW3-PVC	670802.5149	1691230.9575
390	670952.1640	1691699.4910	4072.04	TU/US-C500-STATION1	670757.7079	1691209.2008
391	670948.0960	1691682.1740	4072.36	TU/US-C500-STATION4	670753.6411	1691191.8888
392	670936.4590	1691683.8290	4072.05	TU/US-C500-STATION5	670742.0075	1691193.5434
393	670929.6330	1691690.0950	4072.11	TU/US-C500-STATION2	670735.1834	1691199.8075
394	670923.0530	1691673.0510	4072.18	TU/US-C500-STATION3	670728.6054	1691182.7685
395	670946.5050	1691708.7370	4072.40	TU/US-C500-USTPIT	670752.0506	1691218.4441
396	670961.7540	1691693.8260	4072.62	TU/US-C500-USTPIT	670767.2951	1691203.5375
397	670931.1680	1691662.3970	4072.93	TU/US-C500-USTPIT	670736.7180	1691172.1176
398	670915.4940	1691676.4560	4072.43	TU/US-C500-USTPIT	670721.0485	1691186.1725
399	670921.7940	1691667.6910	4072.61	TU/US-C500-BLDGCOR	670727.3467	1691177.4100
400	670938.3020	1691685.3670	4072.19	TU/US-C500-BLDGCOR	670743.8499	1691195.0809
401	670954.8550	1691686.5260	4072.52	TU/US-C500-BLDGCOR	670760.3981	1691196.2396
402	670964.2580	1691691.8600	4072.50	TU/US-C500-BLDGCOR	670769.7984	1691201.5720
403	670981.1410	1691692.8760	4072.84	TU/US-C500-BLDGCOR	670786.6765	1691202.5877
404	681138.2190	1690535.4430	4109.80	OT-C538-MW1-CASING	680940.8108	1690045.4902
405	681137.9660	1690535.5040	4109.43	OT-C538-MW1-PVC	680940.5579	1690045.5512
406	681154.3000	1690506.8540	4109.64	OT-C538-STATION3	680956.8871	1690016.9095
407	681170.7650	1690504.3700	4110.30	OT-C538-STATION2	680973.3473	1690014.4262
408	681207.7160	1690542.9160	4110.07	OT-C538-STATION1	681010.2876	1690052.9610
409	681171.2020	1690513.1430	4110.35	OT-C538-SEPTIC	680973.7842	1690023.1966
410	681160.8350	1690514.8700	4110.22	OT-C538-SEPTIC	680963.4202	1690024.9231
411	681157.5830	1690502.2430	4109.87	OT-C538-SEPTIC	680960.1692	1690012.2998
412	681168.6240	1690500.8410	4110.30	OT-C538-SEPTIC	680971.2070	1690010.8982
413	681157.7430	1690507.8780	4109.92	OT-C538-FFLUEN	680960.3291	1690017.9332
414	681149.7900	1690513.8560	4109.82	OT-C538-FFLUEN	680952.3784	1690023.9094
415	681146.2870	1690511.1610	4109.76	OT-C538-LEACH	680948.8764	1690021.2152
416	681140.0690	1690516.2140	4109.76	OT-C538-LEACH	680942.6602	1690026.2667
417	681131.8360	1690535.6580	4109.59	OT-C538-LEACH	680934.4296	1690045.7051
418	681142.3480	1690541.6090	4109.45	OT-C538-LEACH	680944.9386	1690051.6544
419	681148.4850	1690524.6340	4109.80	OT-C538-LEACH	680951.0738	1690034.6843
420	681152.9240	1690518.6140	4110.01	OT-C538-LEACH	680955.5115	1690028.6661
421	681171.0630	1690513.0040	4110.32	OT-C538-EFLUEN	680973.6453	1690023.0577
422	681199.3120	1690534.6340	4109.92	OT-C538-EFLUEN	681001.8861	1690044.6814
423	681311.9210	1690619.8910	4111.94	OT-C538-EFLUEN	681114.4624	1690129.9137
424	681378.0600	1690614.8720	4112.52	OT-C538-EFLUEN	681180.5823	1690124.8962
425	681511.9950	1690621.0250	4112.35	OT-C538-EFLUEN-C/O	681314.4785	1690131.0474
426	681543.8210	1690614.3290	4112.13	OT-C538-EFLUEN-C/O	681346.2952	1690124.3533
427	681545.1500	1690624.0320	4110.59	OT-C538-EFLUEN	681347.6238	1690134.0535
428	681526.9290	1690617.7410	4112.19	OT-C538-BLDGCOR	681329.4081	1690127.7643
429	681516.5600	1690627.6780	4112.22	OT-C538-BLDGCOR	681319.0421	1690137.6984
430	681517.0030	1690674.6590	4112.55	OT-C538-BLDGCOR	681319.4850	1690184.6658
431	681526.9640	1690685.0850	4112.68	OT-C538-BLDGCOR	681329.4431	1690195.0888
432	681610.3380	1690617.1910	4112.15	OT-C538-BLDGCOR	681412.7929	1690127.2145
433	681620.0290	1690626.9090	4112.29	OT-C538-BLDGCOR	681422.4811	1690136.9297
434	681248.7970	1690511.7190	4110.11	OT-C537-STATION1	681051.3567	1690021.7731
435	681230.2540	1690505.9940	4109.96	OT-C537-STATION2	681032.8191	1690016.0497

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
436	681220.0430	1690509.7920	4110.12	OT-C537-STATION3	681022.6111	1690019.8466
437	681224.9030	1690501.6020	4109.95	OT-C537-SEPTICDRY	681027.4697	1690011.6590
438	681224.2220	1690518.0560	4110.28	OT-C537-SEPTICDRY	681026.7889	1690028.1082
439	681236.7540	1690518.9910	4110.31	OT-C537-SEPTICDRY	681039.3172	1690029.0429
440	681236.4080	1690501.8520	4110.13	OT-C537-SEPTICDRY	681038.9713	1690011.9089
441	681237.2180	1690508.8330	4110.12	OT-C537-INLINE	681039.7811	1690018.8879
442	681311.7430	1690515.4440	4111.03	OT-C537-INLINE	681114.2845	1690025.4970
443	670561.7210	1680587.5740	4050.10	TU/US-C506-MW2-CASIN	670367.3781	1680100.5043
444	670561.4170	1680587.6760	4049.68	TU/US-C506-MW2-PVC	670367.0742	1680100.6062
445	670504.3430	1680580.0920	4050.14	TU/US-C506-MW1-PVC	670310.0167	1680093.0244
446	670504.5340	1680580.0020	4050.56	TU/US-C506-MW1-CASIN	670310.2076	1680092.9345
447	670508.2600	1680580.6030	4050.26	TU/US-C506-USTTANK	670313.9326	1680093.5353
448	670507.1490	1680575.9500	4050.27	TU/US-C506-USTTANK	670312.8219	1680088.8836
449	670517.9280	1680578.9030	4050.27	TU/US-C506-USTTANK	670323.5978	1680091.8358
450	670517.4300	1680574.2280	4050.28	TU/US-C506-USTTANK	670323.0999	1680087.1621
451	670507.9350	1680578.1630	4050.18	TU/US-C506-STATION1	670313.6077	1680091.0960
452	670513.3690	1680579.8330	4050.20	TU/US-C506-STATION2	670319.0401	1680092.7655
453	670517.9640	1680576.4150	4050.25	TU/US-C506-STATION3	670323.6338	1680089.3485
454	670511.2330	1680575.3810	4050.12	TU/US-C506-STATION4	670316.9047	1680088.3148
455	670512.5770	1680577.6370	4050.16	TU/US-C506-STATION5	670318.2483	1680090.5702
456	670485.1820	1680557.6150	4050.53	TU/US-C506-EXMW1-CAS	670290.8613	1680070.5540
457	670484.8980	1680557.6790	4050.38	TU/US-C506-EXMW1-PVC	670290.5773	1680070.6179
458	670494.8180	1680553.5430	4050.36	TU/US-C506-BLDGCOR	670300.4945	1680066.4831
459	670506.7310	1680561.7710	4050.38	TU/US-C506-BLDGCOR	670312.4040	1680074.7088
460	670510.1770	1680607.5970	4050.36	TU/US-C506-BLDGCOR	670315.8490	1680120.5215
461	670507.2460	1680618.1900	4050.39	TU/US-C506-BLDGCOR	670312.9189	1680131.1114
462	672564.5350	1692766.5990	4084.67	OT-C530-STATION1	672369.6116	1692275.9995
463	672567.1650	1692774.7240	4084.79	OT-C530-STATION2	672372.2409	1692284.1222
464	672567.5210	1692771.2850	4084.93	OT-C530-ACTSEPTIC	672372.5967	1692280.6842
465	672572.0780	1692767.3740	4084.89	OT-C530-ACTSEPTIC	672377.1524	1692276.7743
466	672575.8660	1692771.9070	4084.91	OT-C530-ACTSEPTIC	672380.9393	1692281.3060
467	672571.4280	1692775.8290	4084.95	OT-C530-ACTSEPTIC	672376.5026	1692285.2269
468	672569.6900	1692769.3550	4084.91	OT-C530-INLINE	672374.7651	1692278.7547
469	672563.6000	1692772.1360	4084.83	OT-C530-MW-CASING	672368.6769	1692281.5349
470	672563.2920	1692772.2960	4084.49	OT-C530-MW-PVC	672368.3690	1692281.6949
471	672509.9810	1692700.4750	4085.41	OT-C530-INLINE	672315.0734	1692209.8947
472	672538.3940	1692677.7240	4085.37	OT-C530-BLDGCOR	672343.4782	1692187.1503
473	672538.9710	1692663.8680	4085.27	OT-C530-BLDGCOR	672344.0550	1692173.2983
474	672478.3960	1692731.8290	4085.45	OT-C530-BLDGCOR	672283.4976	1692241.2396
475	672485.2490	1692739.1720	4085.12	OT-C530-BLDGCOR	672290.3486	1692248.5805
476	685978.3640	1686617.0530	4101.95	OT-C534-STATION1	685779.5530	1686128.2358
477	685949.9370	1686623.2970	4101.80	OT-C534-STATION2	685751.1342	1686134.4780
478	686041.6810	1686591.0650	4102.58	OT-C534-BLDGCOR	685842.8517	1686102.2553
479	686050.4200	1686580.6970	4102.78	OT-C534-BLDGCOR	685851.5881	1686091.8903
480	686053.7100	1686616.8100	4102.90	OT-C534-BLDGCOR	685854.8772	1686127.9929
481	686043.1140	1686607.6280	4102.82	OT-C534-BLDGCOR	685844.2842	1686118.8135
482	670482.5190	1680558.2400	4050.60	TU/US-C506-MW3-CASIN	670288.1990	1680071.1788
483	670482.3210	1680558.1750	4050.11	TU/US-C506-MW3-PVC	670288.0011	1680071.1138
484	669451.6250	1685381.2210	4054.88	TU/US-C515-STATION1	669257.6038	1684892.7620
485	669456.5920	1685373.9060	4054.66	TU/US-C515-STATION2	669262.5694	1684885.4491
486	669447.7270	1685364.3830	4054.13	TU/US-C515-STATION3	669253.7069	1684875.9289
487	669442.7430	1685375.3260	4054.34	TU/US-C515-STATION4	669248.7244	1684886.8687
488	669450.0780	1685373.9310	4054.62	TU/US-C515-STATION5	669256.0572	1684885.4741
489	669529.8630	1685390.3120	4053.57	TU/US-C515-MW3-PVC	669335.8191	1684901.8503
490	669530.0710	1685390.1630	4053.84	TU/US-C515-MW3-CASIN	669336.0271	1684901.7014
491	669347.3380	1685357.3580	4053.37	TU/US-C515-MW2-CASIN	669153.3470	1684868.9059
492	669347.0390	1685357.4240	4052.93	TU/US-C515-MW2-PVC	669153.0481	1684868.9719
493	669367.7310	1685396.1250	4053.43	TU/US-C515-MW1-PVC	669173.7341	1684907.6617
494	669368.0180	1685396.0880	4053.86	TU/US-C515-MW1-CASIN	669174.0210	1684907.6247
495	669413.7390	1685386.4140	4054.97	TU/US-C515-BLDGCOR	669219.7288	1684897.9535
496	669405.0760	1685397.5400	4056.39	TU/US-C515-BLDGCOR	669211.0683	1684909.0762
497	669442.6490	1685383.8010	4054.90	TU/US-C515-TANKPIT	669248.6304	1684895.3412
498	669458.4310	1685381.6630	4055.08	TU/US-C515-TANKPIT	669264.4078	1684893.2039
499	669454.7400	1685363.6010	4054.47	TU/US-C515-TANKPIT	669260.7179	1684875.1471
500	669440.8050	1685364.3540	4054.07	TU/US-C515-TANKPIT	669246.7869	1684875.8999
501	669474.3460	1685377.9770	4054.82	TU/US-C515-BLDGCOR	669280.3182	1684889.5189
502	669485.4880	1685386.3880	4055.07	TU/US-C515-BLDGCOR	669291.4570	1684897.9275
503	669257.8420	1685415.0700	4053.20	TU/US-C513-STATION3	669063.8770	1684926.6012
504	669241.6200	1685431.8260	4053.43	TU/US-C513-STATION2	669047.6597	1684943.3523
505	669234.6840	1685421.2410	4053.75	TU/US-C513-STATION5	669040.7257	1684932.7704
506	669232.2550	1685409.8190	4053.42	TU/US-C513-STATION4	669038.2974	1684921.3517

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

Corrections

Point #515
TU/US-515-MW3 PVC

Point #518
TU/US-515-MW2

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
507	669220.1400	1685422.8010	4053.52	TU/US-C513-STATION1	669026.1859	1684934.3299
508	669222.4590	1685431.2530	4053.64	TU/US-C513-TANKPIT	669028.5042	1684942.7795
509	669219.3990	1685411.0450	4054.92	TU/US-C513-TANKPIT	669025.4451	1684922.5773
510	669260.7320	1685426.0370	4053.70	TU/US-C513-TANKPIT	669066.7661	1684937.5650
511	669277.6950	1685433.5720	4053.31	TU/US-C513-MW2-CASIN	669083.7242	1684945.0978
512	669243.5650	1685418.8110	4054.36	TU/US-C513-TRANSPAD	669049.6041	1684930.3411
513	669236.4970	1685419.8090	4054.30	TU/US-C513-TRANSPAD	669042.5381	1684931.3388
514	669235.5680	1685411.9050	4054.57	TU/US-C513-TRANSPAD	669041.6094	1684923.4371
515	669277.6850	1685433.6210	4053.26	TU/US-C513-MW2-C[illegible] PVC	669083.7142	1684945.1468 → MW3
516	669188.9570	1685441.5400	4053.76	TU/US-C513-MW1-CASIN	668995.0119	1684953.0635
517	669188.7180	1685441.6230	4053.31	TU/US-C513-MW1-PVC	668994.7730	1684953.1465
518	669175.0530	1685411.5360	4053.78	TU/US-C513-MW3-PVC	668981.1120	1684923.0682 → MW2
519	669175.2900	1685411.4450	4054.15	TU/US-C513-MW3-CASIN	668981.3489	1684922.9772
520	669194.6820	1685411.4540	4054.72	TU/US-C513-BLDGCOR	669000.7353	1684922.9862
521	669205.8290	1685420.1440	4054.47	TU/US-C513-BLDGCOR	669011.8790	1684931.6737
522	669292.6520	1685418.3920	4053.83	TU/US-C513-BLDGCOR	669098.6769	1684929.9222
523	669293.9380	1685428.2990	4053.77	TU/US-C513-BLDGCOR	669099.9625	1684939.8263
524	685879.9040	1686627.7590	4102.02	OTC-534-CASING	685681.1215	1686138.9387
525	685879.6290	1686627.7910	4101.61	OTC-534-PVC	685680.8466	1686138.9707
526	685894.0510	1686651.2940	4102.15	OTC-534-MW6-CASING	685695.2644	1686162.4669
527	685893.7240	1686651.3020	4101.74	OTC-534-MW6-PVC	685694.9375	1686162.4749
528	685866.3710	1686655.8860	4101.59	OTC-534-MW8-PVC	685667.5925	1686167.0576
529	685866.6060	1686655.6520	4102.06	OTC-534-MW8-CASING	685667.8274	1686166.8236
530	685876.1160	1686687.3140	4102.11	OTC-534-MW5-CASING	685677.3346	1686198.4764
531	685875.8760	1686687.4250	4101.81	OTC-534-MW5-PVC	685677.0947	1686198.5874
532	685834.9910	1686704.4610	4101.83	OTC-534-MW9-PVC	685636.2216	1686215.6185
533	685835.2820	1686704.5300	4102.15	OTC-534-MW9-CASING	685636.5125	1686215.6875
534	685772.4780	1686595.2240	4101.45	OTC-534-MW10-NG	685573.7267	1686106.4131
535	669081.1480	1678793.1860	4046.72	OTC-531B-SEPTANK	668887.2342	1678306.6363
536	669082.4390	1678801.3130	4046.63	OTC-531B-SEPTANK	668888.5248	1678314.7610
537	669072.3810	1678802.9790	4046.81	OTC-531B-SEPTANK	668878.4697	1678316.4265
538	669070.8860	1678795.3530	4046.82	OTC-531B-SEPTANK	668876.9751	1678308.8027
539	669104.1410	1678787.7690	4045.69	OTC-531B-STATION-1	668910.2205	1678301.2209
540	669070.9690	1678801.9800	4046.52	OTC-531B-STATION-2	668877.0581	1678315.4278
541	669061.4820	1678787.2510	4046.24	OTC-531B-STATION-3	668867.5739	1678300.7031
542	669022.2810	1678760.4940	4045.98	OTC-531B-MW-1-PVC	668828.3842	1678273.9538
543	669022.4740	1678760.4670	4046.35	OTC-531B-MW-1-CASING	668828.5772	1678273.9268
544	669029.7060	1678750.8610	4046.12	OTC-531B-LEACH	668835.8071	1678264.3236
545	669044.0770	1678753.3070	4046.04	OTC-531B-LEACH	668850.1739	1678266.7689
546	669048.2090	1678762.3910	4046.19	OTC-531B-LEACH	668854.3047	1678275.8503
547	669052.8600	1678773.5200	4046.17	OTC-531B-LEACH	668858.9544	1678286.9760
548	669051.8580	1678782.0380	4046.19	OTC-531B-LEACH	668857.9527	1678295.4916
549	669045.9680	1678791.0410	4045.97	OTC-531B-LEACH	668852.0644	1678304.4920
550	669037.6080	1678787.3270	4046.05	OTC-531B-LEACH	668843.7068	1678300.7790
551	669030.8940	1678787.9690	4046.07	OTC-531B-LEACH	668836.9947	1678301.4208
552	669024.6850	1678794.4050	4045.99	OTC-531B-LEACH	668830.7875	1678307.8550
553	669012.0060	1678808.0140	4045.98	OTC-531B-LEACH	668818.1122	1678321.4600
554	669005.0390	1678788.3970	4045.95	OTC-531B-LEACH	668811.1472	1678301.8487
555	669008.1540	1678771.5710	4046.05	OTC-531B-LEACH	668814.2613	1678285.0276
556	669012.3090	1678761.0960	4046.10	OTC-531B-LEACH	668818.4151	1678274.5556
557	669052.5660	1678784.6580	4046.08	OTC-531B-FLINE	668858.6605	1678298.1108
558	669071.4380	1678798.9230	4046.55	OTC-531B-FLINE	668877.5270	1678312.3717
559	669082.2160	1678797.7200	4046.58	OTC-531B-ELINE	668888.3019	1678311.1690
560	669109.7160	1678792.3340	4045.64	OTC-531B-ELINE	668915.7939	1678305.7846
561	669130.6340	1678787.5660	4047.05	OTC-531B-ELINE	668936.7058	1678301.0180
562	669132.6960	1678800.0880	4046.87	OTC-531B-BLDGCOR	668938.7672	1678313.5363
563	669139.6540	1678804.9540	4046.97	OTC-531B-BLDGCOR	668945.7232	1678318.4009
564	669127.3740	1678771.5760	4046.72	OTC-531B-BLDGCOR	668933.4468	1678285.0326
565	669131.8520	1678764.6150	4047.25	OTC-531B-BLDGCOR	668937.9235	1678278.0736
566	668593.1300	1678901.9680	4046.19	OTC-531C-BLDGCOR	668399.3576	1678415.3868
567	668588.1250	1678902.8360	4046.21	OTC-531C-BLDGCOR	668394.3541	1678416.2546
568	668585.3350	1678865.5840	4046.55	OTC-531C-BLDGCOR	668391.5649	1678379.0133
569	668590.1110	1678858.6070	4046.53	OTC-531C-BLDGCOR	668396.3395	1678372.0384
570	668590.3090	1678889.4560	4045.95	OTC-531C-ELINE	668396.5374	1678402.8784
571	668578.4210	1678891.4650	4046.03	OTC-531C-ELINE	668384.6529	1678404.8868
572	668560.7680	1678894.7530	4045.47	OTC-531C-ELINE	668367.0050	1678408.1739
573	668535.6480	1678899.2930	4046.35	OTC-531C-ELINE	668341.8923	1678412.7126
574	668535.0660	1678896.4960	4046.68	OTC-531C-SEPTIC	668341.3104	1678409.9164
575	668535.3940	1678905.9700	4046.47	OTC-531C-SEPTIC	668341.6383	1678419.3876
576	668522.2510	1678906.9450	4046.51	OTC-531C-SEPTIC	668328.4992	1678420.3624
577	668522.3100	1678897.4040	4046.39	OTC-531C-SEPTIC	668328.5581	1678410.8241

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
578	668561.9930	1678890.5660	4045.66	OTC-531C-STATION-1	668368.2296	1678403.9881
579	668531.2500	1678902.0810	4046.55	OTC-531C-STATION-2	668337.4955	1678415.4998
580	668522.9580	1678893.5110	4045.84	OTC-531C-STATION-3	668329.2059	1678406.9323
581	668521.6100	1678902.7660	4046.16	OTC-531C-FLINE	668327.8583	1678416.1846
582	668515.2610	1678901.5740	4045.66	OTC-531C-FLINE	668321.5112	1678414.9929
583	668515.8520	1678907.4010	4045.67	OTC-531C-LEACH	668322.1020	1678420.8182
584	668498.6960	1678906.8280	4045.81	OTC-531C-LEACH	668304.9510	1678420.2454
585	668489.9270	1678907.6430	4045.74	OTC-531C-LEACH	668296.1845	1678421.0602
586	668481.5760	1678902.8790	4045.69	OTC-531C-LEACH	668287.8359	1678416.2975
587	668476.1180	1678891.3230	4045.84	OTC-531C-LEACH	668282.3795	1678404.7449
588	668473.4290	1678883.0340	4045.68	OTC-531C-LEACH	668279.6913	1678396.4583
589	668473.7340	1678874.2510	4045.53	OTC-531C-LEACH	668279.9962	1678387.6778
590	668476.2360	1678867.2340	4045.54	OTC-531C-LEACH	668282.4975	1678380.6629
591	668482.1720	1678868.3950	4045.45	OTC-531C-MW-1-PVC	668288.4318	1678381.8235
592	668482.4510	1678868.3680	4045.85	OTC-531C-MW-1-CASING	668288.7107	1678381.7965
593	668490.9400	1678863.0190	4045.60	OTC-531C-LEACH	668297.1972	1678376.4491
594	668503.3450	1678866.8310	4045.87	OTC-531C-LEACH	668309.5986	1678380.2600
595	668508.4050	1678874.1920	4045.93	OTC-531C-LEACH	668314.6572	1678387.6189
596	668515.8970	1678879.7420	4045.82	OTC-531C-LEACH	668322.1470	1678393.1672
597	668524.3970	1678890.3500	4045.70	OTC-531C-LEACH	668330.6445	1678403.7722
598	667495.6300	1679128.7300	4042.53	OTC-532-BLDGCOR	667302.1757	1678642.0831
599	667488.6400	1679123.9580	4042.71	OTC-532-BLDGCOR	667295.1877	1678637.3125
600	667462.6660	1679059.4970	4041.10	OTC-532-BLDGCOR	667269.2212	1678572.8701
601	667481.1840	1679050.1710	4042.61	OTC-532-BLDGCOR	667287.7339	1678563.5469
602	667486.0130	1679106.7520	4042.73	OTC-532-ELINE	667292.5615	1678620.1115
603	667462.4800	1679111.5030	4040.38	OTC-532-ELINE	667269.0353	1678624.8611
604	667462.2250	1679114.4150	4040.62	OTC-532-STATION-1	667268.7804	1678627.7722
605	667442.0090	1679119.1410	4041.24	OTC-532-STATION-2	667248.5702	1678632.4969
606	667419.1640	1679115.1840	4040.86	OTC-532-STATION-3	667225.7319	1678628.5410
607	667385.6930	1679101.6040	4040.50	OTC-532-STATION-4	667192.2706	1678614.9649
608	667381.8850	1679101.5680	4040.62	OTC-532-LEACH	667188.4637	1678614.9290
609	667383.6400	1679091.6130	4040.63	OTC-532-LEACH	667190.2181	1678604.9768
610	667385.4250	1679087.0370	4040.57	OTC-532-LEACH	667192.0026	1678600.4022
611	667388.9960	1679084.4040	4040.65	OTC-532-LEACH	667195.5726	1678597.7699
612	667394.2390	1679084.6140	4040.73	OTC-532-LEACH	667200.8141	1678597.9799
613	667396.1210	1679092.7430	4040.70	OTC-532-LEACH	667202.6955	1678606.1065
614	667398.1240	1679100.9150	4040.70	OTC-532-LEACH	667204.6979	1678614.2761
615	667402.2360	1679106.9240	4040.75	OTC-532-LEACH	667208.8088	1678620.2834
616	667410.1270	1679109.8530	4040.82	OTC-532-LEACH	667216.6975	1678623.2116
617	667419.4540	1679110.1630	4040.85	OTC-532-LEACH	667226.0218	1678623.5215
618	667420.7270	1679120.1400	4041.02	OTC-532-FLINE	667227.2944	1678633.4956
619	667423.8510	1679141.7780	4040.59	OTC-532-LEACH	667230.4175	1678655.1273
620	667412.2990	1679143.4760	4040.74	OTC-532-LEACH	667218.8688	1678656.8248
621	667403.7350	1679143.1670	4040.80	OTC-532-LEACH	667210.3073	1678656.5159
622	667397.0900	1679139.6510	4040.75	OTC-532-LEACH	667203.6642	1678653.0009
623	667384.3300	1679127.9250	4040.44	OTC-532-LEACH	667190.9079	1678641.2783
624	667382.6070	1679116.1130	4040.44	OTC-532-LEACH	667189.1854	1678629.4697
625	667430.4810	1679118.6630	4041.32	OTC-532-FLINE	667237.0456	1678632.0190
626	667430.2210	1679114.2980	4041.25	OTC-532-SEPTIC	667236.7856	1678627.6553
627	667440.5880	1679113.0200	4041.26	OTC-532-SEPTIC	667247.1496	1678626.3776
628	667442.9470	1679123.3120	4041.21	OTC-532-SEPTIC	667249.5080	1678636.6667
629	667430.1210	1679125.8580	4041.28	OTC-532-SEPTIC	667236.6857	1678639.2119
630	667441.8110	1679116.2010	4041.27	OTC-532-ELINE	667248.3723	1678629.5577
631	669659.5140	1678688.1920	4048.05	OTC-531A-ELINE	669465.4326	1678201.6728
632	669645.1200	1678691.4170	4047.42	OTC-531A-ELINE	669451.0427	1678204.8968
633	669626.5240	1678694.6570	4048.54	OTC-531A-ELINE	669432.4521	1678208.1359
634	669625.4550	1678690.5680	4048.58	OTC-531A-SEPTIC	669431.3834	1678204.0481
635	669627.0130	1678697.2200	4048.59	OTC-531A-SEPTIC	669432.9410	1678210.6981
636	669614.1180	1678700.1730	4048.60	OTC-531A-SEPTIC	669420.0497	1678213.6503
637	669613.0940	1678693.8150	4048.72	OTC-531A-SEPTIC	669419.0260	1678207.2941
638	669648.5430	1678685.0250	4047.24	OTC-531A-STATION-1	669454.4647	1678198.5067
639	669615.3510	1678691.9600	4048.59	OTC-531A-STATION-2	669421.2823	1678205.4397
640	669607.0140	1678691.1700	4048.42	OTC-531A-STATION-3	669412.9478	1678204.6499
641	669606.7200	1678688.2040	4048.56	OTC-531A-LEACH	669412.6539	1678201.6848
642	669608.9270	1678706.1330	4048.28	OTC-531A-LEACH	669414.8602	1678219.6086
643	669601.3790	1678707.8980	4048.13	OTC-531A-LEACH	669407.3144	1678221.3730
644	669593.2420	1678708.2220	4047.49	OTC-531A-LEACH	669399.1798	1678221.6970
645	669578.1380	1678708.5010	4047.22	OTC-531A-LEACH	669384.0801	1678221.9759
646	669565.0490	1678706.1840	4047.29	OTC-531A-LEACH	669370.9949	1678219.6595
647	669554.2260	1678694.3690	4047.37	OTC-531A-LEACH	669360.1751	1678207.8480
648	669553.4160	1678687.6760	4047.59	OTC-531A-LEACH	669359.3653	1678201.1569

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
649	669552.5940	1678678.4030	4047.76	OTC-531A-LEACH	669358.5435	1678191.8866
650	669550.0120	1678656.4050	4047.76	OTC-531A-LEACH	669355.9623	1678169.8950
651	669556.1880	1678652.3190	4047.86	OTC-531A-LEACH	669362.1365	1678165.8102
652	669559.2580	1678655.8340	4047.38	OTC-531A-MW-1-PVC	669365.2056	1678169.3241
653	669559.5100	1678655.7600	4047.78	OTC-531A-MW-1-CASING	669365.4575	1678169.2502
654	669561.9190	1678650.8880	4047.69	OTC-531A-LEACH	669367.8658	1678164.3796
655	669569.0970	1678659.8040	4048.02	OTC-531A-LEACH	669375.0418	1678173.2930
656	669574.5390	1678669.0420	4047.77	OTC-531A-LEACH	669380.4822	1678182.5283
657	669580.0480	1678677.6210	4047.77	OTC-531A-LEACH	669385.9896	1678191.1048
658	669581.1180	1678685.2190	4047.72	OTC-531A-LEACH	669387.0593	1678198.7006
659	669589.3790	1678690.0080	4047.91	OTC-531A-LEACH	669395.3179	1678203.4882
660	669598.7410	1678687.4540	4047.88	OTC-531A-LEACH	669404.6772	1678200.9350
661	669608.6000	1678697.8630	4048.38	OTC-531A-FLINE	669414.5333	1678211.3410
662	669613.4950	1678697.0050	4048.61	OTC-531A-FLINE	669419.4269	1678210.4832
663	669434.7190	1685385.1220	4055.15	US/TC-515-EXAVATION	669240.7027	1684896.6618
664	669433.7320	1685375.0770	4054.68	US/TC-515-EXAVATION	669239.7160	1684886.6198
665	669453.6100	1685372.2880	4054.89	US/TC-515-EXAVATION	669259.5882	1684883.8316
666	669455.2490	1685382.6100	4055.08	US/TC-515-EXAVATION	669261.2268	1684894.1506
667	669423.1290	1685379.3360	4054.73	US/TC-515-POTHOLE-1	669229.1161	1684890.8775
668	669443.7270	1685362.1260	4054.20	US/TC-515-POTHOLE-2	669249.7081	1684873.6725
669	669443.2340	1685352.4030	4053.69	US/TC-515-POTHOLE-3	669249.2152	1684863.9523
670	669388.8600	1685382.9350	4054.36	US/TC-515-POTHOLE-4	669194.8570	1684894.4755
671	666075.3380	1693454.3920	4059.75	US/TC-502-TANK/EX	665882.2953	1692963.5932
672	666064.5480	1693454.6090	4059.59	US/TC-502-TANK/EX	665871.5084	1692963.8101
673	666064.5890	1693463.2320	4059.66	US/TC-502-TANK/EX	665871.5494	1692972.4306
674	666075.7420	1693463.6580	4059.85	US/TC-502-TANK/EX	665882.6992	1692972.8565
675	666070.2430	1693458.8620	4059.56	US/TC-502-STATION-1	665877.2018	1692968.0619
676	666075.3470	1693459.1030	4059.61	US/TC-502-STATION-2	665882.3043	1692968.3028
677	666070.4890	1693455.0470	4059.46	US/TC-502-STATION-3	665877.4477	1692964.2480
678	666070.2650	1693463.1340	4059.49	US/TC-502-STATION-4	665877.2238	1692972.3327
679	666072.2440	1693503.2780	4060.12	US/TC-502-FIREHY	665879.2022	1693012.4650
680	669813.9600	1693315.1950	4077.70	US/TC-503-EXAVATION	669619.8338	1692824.4365
681	669826.0790	1693326.7460	4077.45	US/TC-503-EXAVATION	669631.9493	1692835.9842
682	669815.4720	1693337.1950	4077.67	US/TC-503-EXAVATION	669621.3454	1692846.4302
683	669803.8000	1693324.4750	4077.59	US/TC-503-EXAVATION	669609.6767	1692833.7139
684	669818.2990	1693319.1730	4077.48	US/TC-503-BEGTRENCH	669624.1715	1692828.4134
685	669837.0790	1693303.2490	4076.88	US/TC-503-ENDTRENCH	669642.9461	1692812.4940
686	681138.0180	1690539.4590	4109.33	OTC-538-STATION-5	680940.6098	1690049.5050
687	673758.3950	1683356.5480	4060.55	US/TC-514-STATION-1	673563.1256	1682868.6758
688	673765.5540	1683358.1250	4060.47	US/TC-514-STATION-2	673570.2825	1682870.2523
689	673770.0890	1683350.4240	4060.48	US/TC-514-STATION-3	673574.8162	1682862.5535
690	673768.2490	1683354.2670	4060.48	US/TC-514-STATION-4	673572.9768	1682866.3954
691	673777.4280	1683353.4050	4060.71	US/TC-514-STATION-5	673582.1531	1682865.5337
692	673776.8350	1683359.0390	4060.94	US/TC-514-BLDGCOR	673581.5603	1682871.1661
693	673769.7480	1683353.9100	4060.70	US/TC-514-BLDGCOR	673574.4753	1682866.0385
694	673778.8570	1683370.4750	4060.92	US/TC-514-BLDGCOR	673583.5817	1682882.5987
695	673773.9440	1683377.3380	4060.70	US/TC-514-BLDGCOR	673578.6701	1682889.4597
696	673723.3370	1683411.0030	4060.56	US/TC-514-MW-1-PVC	673528.0778	1682923.1150
697	673723.6160	1683410.9000	4061.02	US/TC-514-MW-1-CASIN	673528.3567	1682923.0120
698	673699.2890	1683380.7720	4061.09	US/TC-514-MW-2-CASIN	673504.0367	1682892.8928
699	673698.9660	1683380.8260	4060.66	US/TC-514-MW-2-PVC	673503.7138	1682892.9467
700	673812.5550	1683317.4880	4060.43	US/TC-514-MW-3-PVC	673617.2699	1682829.6271
701	673812.8820	1683317.4350	4060.76	US/TC-514-MW-3-CASIN	673617.5968	1682829.5741
702	673776.7270	1683350.1350	4060.82	US/TC-514-FORM/TANK	673581.4523	1682862.2646
703	673777.3420	1683356.4370	4060.94	US/TC-514-FORM/TANK	673582.0671	1682868.5648
704	673759.1130	1683359.4810	4061.06	US/TC-514-FORM/TANK	673563.8434	1682871.6079
705	673757.7990	1683353.3170	4061.32	US/TC-514-FORM/TANK	673562.5298	1682865.4457
706	678061.9490	1684350.2580	4078.63	US/TC-516-FORMTANK	677865.4323	1683862.0978
707	678072.0100	1684348.4740	4078.61	US/TC-516-FORMTANK	677875.4904	1683860.3143
708	678074.0860	1684360.1530	4078.25	US/TC-516-FORMTANK	677877.5658	1683871.9899
709	678065.1290	1684362.4260	4078.47	US/TC-516-FORMTANK	677868.6114	1683874.2622
710	678069.6040	1684359.8850	4078.30	US/TC-516-STATION-1	677873.0851	1683871.7220
711	678064.5960	1684356.9350	4078.34	US/TC-516-STATION-2	677868.0786	1683868.7728
712	678066.1670	1684350.4200	4078.54	US/TC-516-STATION-3	677869.6491	1683862.2597
713	678072.9250	1684354.8490	4078.09	US/TC-516-STATION-4	677876.4052	1683866.6874
714	678101.7280	1684311.2380	4077.72	US/TC-516-MW-2	677905.1998	1683823.0891
715	678116.9250	1684291.3650	4077.78	US/TC-516-MW-2	677920.3924	1683803.2218
716	678061.7680	1684335.2520	4080.38	US/TC-516-BLDGCOR	677865.2514	1683847.0961
717	678064.6310	1684348.2080	4081.07	US/TC-516-BLDGCOR	677868.1136	1683860.0484
718	678026.7560	1684390.7900	4078.49	US/TC-516-MW-1	677830.2495	1683902.6180
719	678014.0050	1684363.8290	4077.81	US/TC-516-MW-3	677817.5022	1683875.6648

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
720	671269.9880	1692357.3370	4075.08	US/TC-508-FORM/TANK	671075.4398	1691866.8562
721	671299.4450	1692330.8640	4075.18	US/TC-508-FORM/TANK	671104.8883	1691840.3908
722	671324.3300	1692358.5130	4075.17	US/TC-508-FORM/TANK	671129.7661	1691868.0318
723	671294.8560	1692384.8580	4075.02	US/TC-508-FORM/TANK	671100.3006	1691894.3692
724	671311.5950	1692346.0080	4075.12	US/TC-508-STATION-2	671117.0347	1691855.5304
725	671302.2680	1692357.1830	4075.07	US/TC-508-STATION-1	671107.7104	1691866.7022
726	671312.4640	1692368.2800	4074.98	US/TC-508-STATION-4	671117.9035	1691877.7960
727	671282.5110	1692369.9060	4075.01	US/TC-508-STATION-3	671087.9592	1691879.4215
728	671289.2400	1692342.4620	4075.15	US/TC-508-STATION-5	671094.6862	1691851.9855
729	671373.3210	1692386.6060	4075.00	US/TC-508-MW-3-PVC	671178.7429	1691896.1167
730	671373.6120	1692386.5000	4075.33	US/TC-508-MW-3-CASIN	671179.0338	1691896.0107
731	671216.9160	1692488.1670	4075.54	US/TC-508-SS18-MW08-CASIN	671022.3832	1691997.6482
732	671216.7110	1692488.4340	4075.26	US/TC-508-SS18-MW08-PVC	671022.1782	1691997.9152
733	671236.3110	1692301.9320	4075.19	US/TC-508-MW-2-CASIN	671041.7726	1691811.4672
734	671236.1240	1692302.1450	4074.80	US/TC-508-MW-2-PVC	671041.5856	1691811.6801
735	671211.3090	1692324.4610	4075.35	US/TC-508-MW-1-CASIN	671016.7778	1691833.9897
736	671211.0360	1692324.6620	4074.93	US/TC-508-MW-1-PVC	671016.5049	1691834.1906
737	671174.1880	1692241.9700	4074.81	US/TC-508-SS18-MW16-PVC	670979.6676	1691751.5226
738	671174.4770	1692241.7880	4075.34	US/TC-508-SS18-MW16-CASIN	670979.9565	1691751.3406
739	671035.8870	1692106.1030	4074.42	US/TC-508-SS18-MW18-CASIN	670841.4066	1691615.6950
740	671035.6230	1692106.3690	4073.74	US/TC-508-SS18-MW18-PVC	670841.1427	1691615.9609
741	671043.1730	1692355.2630	4075.73	US/TC-508-SS18-MW19-PVC	670848.6905	1691864.7828
742	670383.2120	1691278.5670	4072.57	US/TC-504-MW-2-CASIN	670188.9208	1690788.3988
743	670383.0220	1691278.7790	4072.19	US/TC-504-MW-2-PVC	670188.7309	1690788.6107
744	670343.7050	1691297.2270	4072.57	US/TC-504-MW-1-PVC	670149.4253	1690807.0534
745	670343.9460	1691296.8630	4072.80	US/TC-504-MW-1-CASIN	670149.6662	1690806.6895
746	669680.3630	1678704.0610	4048.54	OTC-531A-BLDGCOR	669486.2755	1678217.5372
747	669673.4280	1678699.1340	4048.44	OTC-531A-BLDGCOR	669479.3425	1678212.6116
748	669662.1160	1678671.3190	4048.32	OTC-531A-BLDGCOR	669468.0338	1678184.8047
749	669671.0810	1678657.6480	4048.29	OTC-531A-BLDGCOR	669476.9962	1678171.1376
750	669671.6690	1678686.6260	4048.54	OTC-531A-ELINE	669477.5840	1678200.1072
751	670995.2900	1691723.6540	4072.55	US/TC-500-STATION-6	670800.8214	1691233.3568
752	682707.7150	1693994.3080	4139.12	OTC-539-SEPTIC	682509.8519	1693503.3527
753	682707.1360	1693987.5070	4139.01	OTC-539-SEPTIC	682509.2731	1693496.5537
754	682713.9270	1693987.3840	4139.07	OTC-539-SEPTIC	682516.0621	1693496.4307
755	682714.4020	1693993.8490	4139.12	OTC-539-SEPTIC	682516.5370	1693502.8939
756	682710.5050	1693994.2530	4139.11	OTC-539-ELINE	682512.6411	1693503.2977
757	682711.7750	1694038.3560	4139.83	OTC-539-ELINE	682513.9107	1693547.3880
758	682709.6340	1694009.1330	4139.38	OTC-539-STATION-1	682511.7704	1693518.1734
759	682715.9010	1693990.7160	4139.12	OTC-539-STATION-2	682518.0355	1693499.7618
760	682707.9950	1693985.7400	4139.05	OTC-539-STATION-3	682510.1318	1693494.7872
761	682690.1540	1693966.7430	4138.58	OTC-539-STATION-4	682492.2960	1693475.7957
762	682700.5510	1693984.6270	4139.10	OTC-539-LEACH	682502.6900	1693493.6745
763	682694.7220	1693978.9800	4138.75	OTC-539-LEACH	682496.8627	1693488.0292
764	682685.8570	1693975.5370	4138.62	OTC-539-LEACH	682488.0002	1693484.5872
765	682686.8260	1693963.6500	4138.56	OTC-539-LEACH	682488.9690	1693472.7036
766	682690.9260	1693959.9730	4138.78	OTC-539-LEACH	682493.0678	1693469.0277
767	682696.9840	1693956.9410	4138.94	OTC-539-LEACH	682499.1240	1693465.9966
768	682705.4410	1693958.5980	4139.12	OTC-539-LEACH	682507.5786	1693467.6531
769	682714.7430	1693968.3290	4139.32	OTC-539-LEACH	682516.8779	1693477.3813
770	682721.4010	1693976.8710	4139.30	OTC-539-LEACH	682523.5339	1693485.9208
771	682717.7930	1693983.8070	4139.35	OTC-539-LEACH	682519.9270	1693492.8548
772	682710.1830	1693984.5790	4139.16	OTC-539-FLINE	682512.3192	1693493.6265
773	682710.2190	1693987.2160	4139.18	OTC-539-FLINE	682512.3552	1693496.2628
774	682690.6020	1694039.4720	4139.43	OTC-539-BLDGCOR	682492.7439	1693548.5036
775	682684.8200	1694045.5030	4139.27	OTC-539-BLDGCOR	682486.9635	1693554.5329
776	682741.4000	1694039.0240	4140.22	OTC-539-BLDGCOR	682543.5271	1693548.0558
777	682747.1830	1694045.0970	4140.68	OTC-539-BLDGCOR	682549.3085	1693554.1270

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7824
PROFESSIONAL SURVEYOR

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
778	686068.4560	1686694.7280	4103.68	OTC-534-MW-10-PVC	685869.6189	1686205.8883
779	686068.7800	1686694.7810	4104.06	OTC-534-MW-10-CASING	685869.9428	1686205.9413
780	685846.6180	1686522.2590	4102.52	OTC-534-MW-11-CASING	685647.8452	1686033.4693
781	685846.3620	1686522.2240	4102.15	OTC-534-MW-11-PVC	685647.5893	1686033.4343
782	685670.3280	1686561.9490	4102.29	OTC-534-MW-12-PVC	685471.6063	1686073.1478
783	685670.6410	1686561.9860	4102.69	OTC-534-MW-12-CASING	685471.9192	1686073.1848

RAW DATA

HOLLOMAN AIR FORCE BASE
WEST SITE

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	684793.2210	1611172.5300	3911.93	BASE	684598.9178	1610715.3759
2	682531.9480	1628747.6200	3965.57	EC-30	682338.2864	1628285.4792
3	682452.1330	1628714.0920	3957.20	EC-30-2	682258.4940	1628251.9607
4	698323.2620	1606321.3780	3915.08	CHAS	698125.1198	1605865.6004
5	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
60	616427.1730	1576921.6540	3941.67	LUCERO	616252.2680	1576474.2182
61	600657.7750	1576446.9260	4131.58	GERI	600487.3444	1575999.6249
62	614156.5210	1568701.1170	4227.09	SW 30	613982.2602	1568256.0137
63	575518.1130	1586543.7100	4038.20	BRYCE AZ MK	575354.8155	1586093.5441
64	576512.9440	1582067.6800	4357.70	BRYCE	576349.3642	1581618.7841
65	633185.2600	1566510.7280	4417.64	HORN	633005.6000	1566066.2462
66	580320.9040	1585783.2080	4128.59	NICK 2	580156.2437	1585333.2579
67	682452.1790	1628714.1810	3957.10	EC-30-2	682258.5400	1628252.0496
68	698323.2620	1606321.3780	3914.70	CHAS	698125.1198	1605865.6004
69	698212.0050	1609477.2870	3928.40	CHUCK	698013.8943	1609020.6139
70	682531.9020	1628747.5310	3965.57	EC-30	682338.2404	1628285.3902
71	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
100	684194.1900	1611160.8710	3912.56	USTC-518-NG	684000.0567	1610703.7202
101	684194.8810	1611165.7430	3912.33	USTC-518-NG	684000.7475	1610708.5908
102	684188.7970	1611168.5190	3912.27	USTC-518-NG	683994.6653	1610711.3660
103	684189.4230	1611176.5450	3912.53	USTC-518-NG	683995.2911	1610719.3898
104	684179.6480	1611178.5150	3912.57	USTC-518-NG	683985.5189	1610721.3592
105	684178.1630	1611171.1680	3912.37	USTC-518-NG	683984.0343	1610714.0143
106	684177.1790	1611163.0630	3913.00	USTC-518-NG	683983.0506	1610705.9116
107	684157.6940	1611173.6700	3912.42	USTC-518-STATION-5	683963.5711	1610716.5156
108	684176.2170	1611179.5100	3912.28	USTC-518-STATION-4	683982.0888	1610722.3539
109	684175.8730	1611172.3430	3912.51	USTC-518-STATION-2	683981.7449	1610715.1890
110	684173.8830	1611163.3430	3912.65	USTC-518-STATION-3	683979.7555	1610706.1915
111	684189.5770	1611170.0220	3912.30	USTC-518-STATION-1	683995.4450	1610712.8686
112	684160.3220	1611172.8640	3912.49	USTC-518-POTHOLE-1	683966.1984	1610715.7098
113	684125.1520	1611185.2360	3910.93	USTC-518-MW-1	683931.0383	1610728.0783
114	684130.9190	1611216.0540	3911.17	USTC-518-MW-2	683936.8037	1610758.8876
115	684158.8770	1611187.1610	3912.34	USTC-518-BLDGCORN-70	683964.7538	1610730.0028
116	684163.9700	1611180.4420	3912.46	USTC-518-BLDGCORN-70	683969.8453	1610723.2857
117	684211.6690	1611174.1790	3912.47	USTC-518-BLDGCORN-70	684017.5308	1610717.0244
118	684218.3800	1611179.3060	3912.45	USTC-518-BLDGCORN-70	684024.2399	1610722.1500
119	684236.0190	1611144.8000	3911.88	USTC-518-NAIL	684041.8739	1610687.6538
120	684242.7800	1611133.9130	3911.77	USTC-518-NAIL	684048.6330	1610676.7699
121	684203.7200	1611162.6570	3912.21	USTC-518-STATION-6	684009.5840	1610705.5057

SURVEYOR'S CERTIFICATION

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SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7924
PROFESSIONAL SURVEYOR

Appendix I
Laboratory Analytical Data and Data Validation Checklists

Note: The data validation checklists and laboratory analytical data reports are provided as separate files.

Appendix J
Waste Manifests

HAFB-001

Generator's Name	Generator's Address	Generator's Telephone No.
USAF	550 TABOSA AVE Holloman AFB NM 88330	575-491-8262

Origin of Special Waste (Project or Spill Location): ~~White Sands National Monument Park - Storage Lagoons~~ Holloman AFB NM Bldg # 55

Transporter #1 Company Name	Address	Telephone No.
Southwest Disposal	1350 LaVelle Road	575-434-1109
Transporter #2 Company Name	Address	Telephone No.
	Alamogordo, NM 88310	

Destination Facility Name/Site Address	Facility ID (Permit) Number	Telephone No.
Otero/Greentree Regional Landfill 24 Mls South of Alamogordo, Hwy 54	SWM-109102	575-439-4355

Type and Proper Name of Special Waste	Container(s) No.	Container(s) Type	Total Quantity	Unit Wt/Vol	
Non RCRA/Non Hazardous Substance ~~(Treatment Plant Lagoon Sludge)~~ (soil)		SD		6.95	Tons

Additional Descriptions for Special Waste Listed Above:

Site Contact: Todd Hiltunen 307-214-6080

Special Handling Instructions:

Southwest Disposal - Lined and Covered Roll-off

GENERATOR'S CERTIFICATION I hereby certify that the contents of this shipment are fully and accurately described above by type and proper name of the special waste, and that such waste has been managed, packaged, containerized and labeled in accordance with the requirements of 20.9.8 NMAC (Special Waste Requirements) in addition to any other applicable federal, state or local regulations.

Truck # 553 Bin #

Printed/Typed Name:	Signature:	Date:
Todd Hiltunen for Brent Hunt (CES)	for Brent Hunt (CES)	9/25/12

Transporter 1 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:
David Gurnbach		9/26/12

Transporter 2 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:

Discrepancy Indication Space:

Analytical supplied to landfill

no facility ID number

Facility Owner or Operator: ***I hereby acknowledge receipt of the special waste as indicated upon this manifest, except as noted above in the Discrepancy Indication Space.***

Printed/Typed Name:	Signature:	Date:
Darrell McGinnis / Attendant		9-26-12

~~Facility~~

OTERO/GREENTREE
REGIONAL LANDFILL

TRANSACTION: 28,080

CO. NAME:

ADDRESS: Environmental Waste Solutions
1348 B. Redtail Hawk Drive

CITY & STATE: Boardman, OH 44512

DATE: 9/26/12 TIME: 9:07 am

TRUCK NO.: 198

GROSS WEIGHT 47000

TARE WEIGHT: 33100

NET TONS: 13900 6.95

COST $: [redacted]

5% TAX $:

TOTAL DUE $:

WASTE: 5

WASTE DESC.: Construction Debris
H.A.F.B.

WASTE ORIGIN:

DRIVER

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-066

Appendix K
Risk Evaluation Calculations

Risk Additivity
Soil Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC530-CS-0001-101812		OTC530-CS-0002-101812		OTC530-IS-0001-071712		OTC530-IS-0002-071712-FD		OTC530-IS-0004-071712		OTC530-IS-0006-082912		OTC530-IS-0007-082912	
				Sample Date	10/18/2012		10/18/2012		7/17/2012		7/17/2012		7/17/2012		8/29/2012		8/29/2012	
				Location	CON1, under tank		CON2, under tank		Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 3, MW-01		Station 3, MW-01	
				Depth (ft bgs)	6 - 6.25		6 - 6.25		3 - 5		3 - 5		7 - 9		0 - 2		3 - 5	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**77.5**		**77.8**		**84.7**		**88.1**		**73.3**		**81.4**		**83.5**	
VOLATILES (mg/kg)																		
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0035	U	0.004	U	0.001	U	0.00083	U	0.00097	U	0.0012	U	0.0011	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0035	U	0.004	U	0.0011	U	0.0009	U	0.0011	U	0.0013	U	0.0012	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0035	U	0.004	U	0.0015	U	0.0013	U	0.0015	U	0.0018	U	0.0016	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0035	U	0.004	U	0.001	U	0.00083	U	0.00097	U	0.0012	U	0.0011	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0035	U	0.004	U	0.001	U	0.00083	U	0.00097	U	0.0012	U	0.0011	U
1,1-DICHLOROETHENE	NE	240	449		0.0035	U	0.004	U	0.0013	U	0.0011	U	0.0012	U	0.0015	U	0.0013	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0035	U	0.004	U	0.0011	U	0.0009	U	0.0011	U	0.0013	U	0.0012	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0035	U	0.004	U	0.0021	U	0.0017	U	0.002	U	0.0025	U	0.0022	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.0035	U	0.004	U	0.00091	U	0.00075	U	0.00088	U	0.0011	U	0.00096	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0035	U	0.004	U	0.001	U	0.00083	U	0.00097	U	0.0012	U	0.0011	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.0035	U	0.004	U	0.00091	U	0.00075	U	0.00088	U	0.0011	U	0.00096	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0035	U	0.004	U	0.0011	U	0.0009	U	0.0011	U	0.0013	U	0.0012	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0035	U	0.004	U	0.0011	U	0.0009	U	0.0011	U	0.0013	U	0.0012	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0035	U	0.004	U	0.001	U	0.00083	U	0.00097	U	0.0012	U	0.0011	U
2-HEXANONE	NE	210	NE		0.018	U	0.02	U	0.0049	U	0.0041	U	0.0047	U	0.0058	U	0.0052	U
ACETONE	NE	61000	66600		0.035	U	0.04	U	0.018	U	0.015	U	0.018	U	0.021	U	0.019	U
BENZENE	NE	1.1	15.4		0.0035	U	0.004	U	0.0014	U	0.0011	U	0.0013	U	0.0016	U	0.0014	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0035	U	0.004	U	0.001	U	0.00083	U	0.00097	U	0.0012	U	0.0011	U
BROMOFORM	NE	62	616		0.0035	U	0.004	U	0.0014	U	0.0011	U	0.0013	U	0.0016	U	0.0014	U
BROMOMETHANE	NE	7.3	16.5		0.0035	U	0.004	U	0.0018	U	0.0015	U	0.0018	U	0.0021	U	0.0019	U
CARBON DISULFIDE	NE	820	1530		0.0035	U	0.004	U	0.0018	U	0.0015	U	0.0018	U	0.0021	U	0.0019	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0035	U	0.004	U	0.0016	U	0.0014	U	0.0016	U	0.0019	U	0.0017	U
CHLOROBENZENE	NE	290	376		0.0035	U	0.004	U	0.00091	U	0.00075	U	0.00088	U	0.0011	U	0.00096	U
CHLOROETHANE	NE	15000	29800		0.0035	U	0.004	U	0.0018	U	0.0015	U	0.0018	U	0.0021	U	0.0019	U
CHLOROFORM	NE	0.29	5.86		0.0035	U	0.004	U	0.0011	U	0.0009	U	0.0011	U	0.0013	U	0.0012	U
CHLOROMETHANE	NE	120	275		0.0035	U	0.004	U	0.0018	U	0.0015	U	0.0018	U	0.0021	U	0.0019	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0035	U	0.004	U	0.0014	U	0.0011	U	0.0013	U	0.0016	U	0.0014	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0035	U	0.004	U	0.00091	U	0.00075	U	0.00088	U	0.0011	U	0.00096	U
CYCLOHEXANE	NE	7000	NE		0.0035	U	0.004	U	0.0013	U	0.0011	U	0.0012	U	0.0015	U	0.0013	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.0035	U	0.004	U	0.00091	U	0.00075	U	0.00088	U	0.0011	U	0.00096	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0035	U	0.004	U	0.0014	U	0.0011	U	0.0013	U	0.0016	U	0.0014	U
ETHYLBENZENE	NE	5.4	68.4		0.0035	U	0.004	U	0.00091	U	0.00075	U	0.00088	U	0.0011	U	0.00096	U
ISOPROPYLBENZENE	NE	2100	2430		0.0035	U	0.004	U	0.001	U	0.00083	U	0.00097	U	0.0012	U	0.0011	U
METHYL ACETATE	NE	78000	78200		0.018	U	0.02	U	0.011	U	0.0094	U	0.011	U	0.013	U	0.012	U
METHYL ETHYL KETONE	NE	28000	37100		0.018	U	0.02	U	0.0055	U	0.0046	U	0.0054	U	0.0065	U	0.0059	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.018	U	0.02	U	0.005	U	0.0041	U	0.0048	U	0.0059	U	0.0053	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0035	U	0.004	U	0.0012	U	0.00098	U	0.0011	U	0.0014	U	0.0012	U
METHYLENE CHLORIDE	NE	56	409		0.0071	U	0.0081	U	0.0042	U	0.0035	U	0.004	U	0.0049	U	0.0044	U

Risk Additivity Evaluation at Building 308, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
PERCENT SOLIDS				
VOLATILES (mg/kg)				
1,1,1-TRICHLOROETHANE		ND		
1,1,2,2-TETRACHLOROETHANE		ND		
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND		
1,1,2-TRICHLOROETHANE		ND		
1,1-DICHLOROETHANE		ND		
1,1-DICHLOROETHENE		ND		
1,2,4-TRICHLOROBENZENE		ND		
1,2-DIBROMO-3-CHLOROPROPANE		ND		
1,2-DIBROMOETHANE		ND		
1,2-DICHLOROBENZENE		ND		
1,2-DICHLOROETHANE		ND		
1,2-DICHLOROPROPANE		ND		
1,3-DICHLOROBENZENE		ND		
1,4-DICHLOROBENZENE		ND		
2-HEXANONE		ND		
ACETONE		ND		
BENZENE		ND		
BROMODICHLOROMETHANE		ND		
BROMOFORM		ND		
BROMOMETHANE		ND		
CARBON DISULFIDE		ND		
CARBON TETRACHLORIDE		ND		
CHLOROBENZENE		ND		
CHLOROETHANE		ND		
CHLOROFORM		ND		
CHLOROMETHANE		ND		
CIS-1,2-DICHLOROETHYLENE		ND		
CIS-1,3-DICHLOROPROPENE		ND		
CYCLOHEXANE		ND		
DIBROMOCHLOROMETHANE		ND		
DICHLORODIFLUOROMETHANE		ND		
ETHYLBENZENE		ND		
ISOPROPYLBENZENE		ND		
METHYL ACETATE		ND		
METHYL ETHYL KETONE		ND		
METHYL ISOBUTYL KETONE		ND		
METHYLCYCLOHEXANE		ND		
METHYLENE CHLORIDE		ND		

Risk Additivity
Soil Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC530-CS-0001-101812		OTC530-CS-0002-101812		OTC530-IS-0001-071712		OTC530-IS-0002-071712-FD		OTC530-IS-0004-071712		OTC530-IS-0006-082912		OTC530-IS-0007-082912	
				Sample Date	10/18/2012		10/18/2012		7/17/2012		7/17/2012		7/17/2012		8/29/2012		8/29/2012	
				Location	CON1, under tank		CON2, under tank		Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 3, MW-01		Station 3, MW-01	
				Depth (ft bgs)	6 - 6.25		6 - 6.25		3 - 5		3 - 5		7 - 9		0 - 2		3 - 5	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																		
STYRENE	NE	6300	7280		0.0035	U	0.004	U	0.0024	U	0.002	U	0.0023	U	0.0028	U	0.0025	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0035	U	0.004	U	0.0018	U	0.0015	U	0.0018	U	0.0021	U	0.0019	U
TETRACHLOROETHYLENE	NE	22	7.02		0.0035	U	0.004	U	0.00091	U	0.00075	U	0.00088	U	0.0011	U	0.00096	U
TOLUENE	NE	5000	5270		0.0035	U	0.00092	J	0.0011	U	0.0009	U	0.0011	U	0.0013	U	0.0012	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0035	U	0.004	U	0.0014	U	0.0011	U	0.0013	U	0.0016	U	0.0014	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0035	U	0.004	U	0.001	U	0.00083	U	0.00097	U	0.0012	U	0.0011	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0035	U	0.004	U	0.0011	U	0.0009	U	0.0011	U	0.0013	U	0.0012	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0035	U	0.004	U	0.0018	U	0.0015	U	0.0018	U	0.0021	U	0.0019	U
VINYL CHLORIDE	NE	0.06	0.728		0.0035	U	0.004	U	0.0014	U	0.0011	U	0.0013	U	0.0016	U	0.0014	U
XYLENES, TOTAL	NE	630	814		0.011	U	0.012	U	0.0029	U	0.0024	U	0.0028	U	0.0034	U	0.0031	U
SEMIVOLATILES (mg/kg)																		
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
2,4-DICHLOROPHENOL	NE	180	183		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.21	U	0.21	U	0.025	U	0.023	U	0.028	U	0.026	U	0.025	U
2,4-DINITROPHENOL	NE	120	122		1.1	U	1.1	U	0.39	U	0.37	U	0.45	U	0.41	U	0.4	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
2,6-DINITROTOLUENE	NE	61	61.1		0.21	U	0.21	U	0.023	U	0.022	U	0.027	U	0.024	U	0.024	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.21	U	0.21	U	0.039	U	0.037	U	0.045	U	0.041	U	0.04	U
2-CHLOROPHENOL	NE	390	391		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
2-METHYLNAPHTHALENE	NE	230	NE		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
2-METHYLPHENOL	NE	3100	NE		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
2-NITROANILINE	NE	610	NE		0.21	U	0.21	U	0.039	U	0.037	U	0.045	U	0.041	U	0.04	U
2-NITROPHENOL	NE	NE	NE		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.21	U	0.21	U	0.039	U	0.037	U	0.045	U	0.041	U	0.04	U
3-NITROANILINE	NE	NE	NE		0.21	U	0.21	U	0.039	U	0.037	U	0.045	U	0.041	U	0.04	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.42	U	0.42	U	0.078	U	0.074	U	0.09	U	0.082	U	0.081	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
4-CHLOROANILINE	NE	2.4	NE		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	UJ	0.02	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
4-NITROANILINE	NE	24	NE		0.21	U	0.21	U	0.039	U	0.037	U	0.045	U	0.041	U	0.04	U
4-NITROPHENOL	NE	NE	NE		1.1	U	1.1	U	0.16	U	0.15	U	0.18	U	0.16	U	0.16	U
ACENAPHTHENE	NE	3400	3440		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
ACENAPHTHYLENE	NE	NE	NE		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
ACETOPHENONE	NE	7800	7820		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
ANTHRACENE	NE	17000	17200		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
ATRAZINE	NE	2.1	NE		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U

Risk Additivity Evaluation at Building 308, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
VOLATILES - continued (mg/kg)				
STYRENE		ND		
TERT-BUTYL METHYL ETHER		ND		
TETRACHLOROETHYLENE		ND		
TOLUENE	N	0.00092		0.00000017
TRANS-1,2-DICHLOROETHENE		ND		
TRANS-1,3-DICHLOROPROPENE		ND		
TRICHLOROETHYLENE		ND		
TRICHLOROFLUOROMETHANE		ND		
VINYL CHLORIDE		ND		
XYLENES, TOTAL		ND		
SEMIVOLATILES (mg/kg)				
2,2'-OXYBIS(1-CHLORO)PROPANE		ND		
2,4,5-TRICHLOROPHENOL		ND		
2,4,6-TRICHLOROPHENOL		ND		
2,4-DICHLOROPHENOL		ND		
2,4-DIMETHYLPHENOL		ND		
2,4-DINITROPHENOL		ND		
2,4-DINITROTOLUENE		ND		
2,6-DINITROTOLUENE		ND		
2-CHLORONAPHTHALENE		ND		
2-CHLOROPHENOL		ND		
2-METHYLNAPHTHALENE		ND		
2-METHYLPHENOL		ND		
2-NITROANILINE		ND		
2-NITROPHENOL		ND		
3,3'-DICHLOROBENZIDINE		ND		
3-NITROANILINE		ND		
4,6-DINITRO-2-METHYLPHENOL		ND		
4-BROMOPHENYL PHENYL ETHER		ND		
4-CHLORO-3-METHYLPHENOL		ND		
4-CHLOROANILINE		ND		
4-CHLOROPHENYL PHENYL ETHER		ND		
4-NITROANILINE		ND		
4-NITROPHENOL		ND		
ACENAPHTHENE		ND		
ACENAPHTHYLENE		ND		
ACETOPHENONE		ND		
ANTHRACENE		ND		
ATRAZINE		ND		

Risk Additivity
Soil Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC530-CS-0001-101812		OTC530-CS-0002-101812		OTC530-IS-0001-071712		OTC530-IS-0002-071712-FD		OTC530-IS-0004-071712		OTC530-IS-0006-082912		OTC530-IS-0007-082912	
				Sample Date	10/18/2012		10/18/2012		7/17/2012		7/17/2012		7/17/2012		8/29/2012		8/29/2012	
				Location	CON1, under tank		CON2, under tank		Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 3, MW-01		Station 3, MW-01	
				Depth (ft bgs)	6 - 6.25		6 - 6.25		3 - 5		3 - 5		7 - 9		0 - 2		3 - 5	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																		
BENZALDEHYDE	NE	7800	NE		1.1	U	1.1	U	0.2	U	0.19	U	0.23	U	0.2	U	0.2	U
BENZO(A)ANTHRACENE	NE	0.15	1.48		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
BENZO(A)PYRENE	NE	0.015	0.148		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
BENZO(G,H,I)PERYLENE	NE	NE	NE		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
BENZYL BUTYL PHTHALATE	NE	260	NE		0.21	U	0.21	U	0.039	U	0.037	U	0.045	U	0.041	U	0.04	U
BIPHENYL	NE	51	57.1		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347		0.42	U	0.42	U	0.078	U	0.074	U	0.09	U	0.082	U	0.081	U
CAPROLACTAM	NE	31000	NE		0.21	U	0.21	U	0.063	U	0.06	U	0.072	U	0.066	U	0.065	U
CARBAZOLE	NE	NE	NE		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
CHRYSENE	NE	15	148		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
DIBENZOFURAN	NE	78	NE		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
DIETHYL PHTHALATE	NE	49000	48900		0.42	U	0.42	U	0.078	U	0.074	U	0.09	U	0.082	U	0.081	U
DIMETHYL PHTHALATE	NE	611000	611000		0.21	U	0.21	U	0.039	U	0.037	U	0.045	U	0.041	U	0.04	U
DI-N-BUTYL PHTHALATE	NE	6100	6110		0.42	U	0.42	U	0.078	U	0.074	U	0.09	U	0.082	U	0.081	U
DI-N-OCTYLPHTHALATE	NE	730	NE		0.21	U	0.21	U	0.039	U	0.037	U	0.045	U	0.041	U	0.04	U
FLUORANTHENE	NE	2300	2290		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
FLUORENE	NE	2300	2290		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
HEXACHLOROBENZENE	NE	0.3	3.04		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
HEXACHLOROBUTADIENE	NE	6.2	61.1		0.21	U	0.21	U	0.039	U	0.037	U	0.045	U	0.041	U	0.04	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367		0.21	U	0.21	U	0.086	U	0.082	U	0.099	U	0.09	U	0.089	U
HEXACHLOROETHANE	NE	12	42.8		0.21	U	0.21	U	0.039	U	0.037	U	0.045	U	0.041	U	0.04	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
ISOPHORONE	NE	510	5120		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
M,P-CRESOL	NE	NE	NE		0.21	U	0.21	U	0.028	U	0.027	U	0.033	U	0.029	U	0.029	U
NAPHTHALENE	NE	3.6	43.0		0.21	U	0.21	U	0.031	U	0.03	U	0.036	U	0.033	U	0.032	U
NITROBENZENE	NE	4.8	53.5		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
N-NITROSODIPHENYLAMINE	NE	99	993		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
PENTACHLOROPHENOL	NE	0.89	8.94		1.1	U	1.1	U	0.24	U	0.22	U	0.27	U	0.25	U	0.24	U
PHENANTHRENE	NE	1830	1830		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
PHENOL	NE	18000	18300		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U
PYRENE	NE	1700	1720		0.21	U	0.21	U	0.02	U	0.019	U	0.023	U	0.02	U	0.02	U

Risk Additivity Evaluation at Building 308, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
SEMIVOLATILES - continued (mg/kg)				
BENZALDEHYDE		ND		
BENZO(A)ANTHRACENE		ND		
BENZO(A)PYRENE		ND		
BENZO(B)FLUORANTHENE		ND		
BENZO(G,H,I)PERYLENE		ND		
BENZO(K)FLUORANTHENE		ND		
BENZYL BUTYL PHTHALATE		ND		
BIPHENYL		ND		
BIS(2-CHLOROETHOXY) METHANE		ND		
BIS(2-CHLOROETHYL) ETHER		ND		
BIS(2-ETHYLHEXYL) PHTHALATE		ND		
CAPROLACTAM		ND		
CARBAZOLE		ND		
CHRYSENE		ND		
DIBENZ(A,H)ANTHRACENE		ND		
DIBENZOFURAN		ND		
DIETHYL PHTHALATE		ND		
DIMETHYL PHTHALATE		ND		
DI-N-BUTYL PHTHALATE		ND		
DI-N-OCTYLPHTHALATE		ND		
FLUORANTHENE		ND		
FLUORENE		ND		
HEXACHLOROBENZENE		ND		
HEXACHLOROBUTADIENE		ND		
HEXACHLOROCYCLOPENTADIENE		ND		
HEXACHLOROETHANE		ND		
INDENO(1,2,3-C,D)PYRENE		ND		
ISOPHORONE		ND		
M,P-CRESOL		ND		
NAPHTHALENE		ND		
NITROBENZENE		ND		
N-NITROSODI-N-PROPYLAMINE		ND		
N-NITROSODIPHENYLAMINE		ND		
PENTACHLOROPHENOL		ND		
PHENANTHRENE		ND		
PHENOL		ND		
PYRENE		ND		

Risk Additivity
Soil Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC530-CS-0001-101812		OTC530-CS-0002-101812		OTC530-IS-0001-071712		OTC530-IS-0002-071712-FD		OTC530-IS-0004-071712		OTC530-IS-0006-082912		OTC530-IS-0007-082912	
				Sample Date		10/18/2012		10/18/2012		7/17/2012		7/17/2012		7/17/2012		8/29/2012		8/29/2012	
				Location		CON1, under tank		CON2, under tank		Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 3, MW-01		Station 3, MW-01	
				Depth (ft bgs)		6 - 6.25		6 - 6.25		3 - 5		3 - 5		7 - 9		0 - 2		3 - 5	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																			
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.15	U	0.16	U	0.06	U	0.06	U	0.059	U	0.062	U	0.071	U		
1,3-DINITROBENZENE	NE	6.10	NE	0.15	U	0.16	U	0.06	U	0.06	U	0.059	U	0.062	U	0.071	U		
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.15	U	0.16	U	0.06	U	0.06	U	0.059	U	0.062	U	0.071	U		
2,4-DINITROTOLUENE	NE	1.60	15.7	0.15	U	0.16	U	0.073	U	0.073	U	0.072	U	0.075	U	0.087	U		
2,6-DINITROTOLUENE	NE	61.0	61.1	0.15	U	0.16	U	0.065	U	0.065	U	0.065	U	0.067	U	0.078	U		
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.15	U	0.16	U	0.06	U	0.06	U	0.059	U	0.062	U	0.071	U		
2-NITROTOLUENE	NE	2.90	29.1	0.15	U	0.16	U	0.06	U	0.06	U	0.059	U	0.062	U	0.071	U		
3-NITROTOLUENE	NE	6.10	7.82	0.15	U	0.16	U	0.06	U	0.06	U	0.059	U	0.062	U	0.071	U		
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.15	U	0.16	U	0.06	U	0.06	U	0.059	U	0.062	U	0.071	U		
4-NITROTOLUENE	NE	30.0	244.4	0.15	U	0.16	U	0.076	U	0.076	U	0.075	U	0.078	U	0.09	U		
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.15	U	0.16	U	0.06	U	0.06	U	0.059	U	0.062	U	0.071	U		
NITROBENZENE	NE	4.80	53.5	0.15	U	0.16	U	0.07	U	0.07	U	0.069	U	0.072	U	0.083	U		
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.15	U	0.16	U	0.06	U	0.06	U	0.059	U	0.062	U	0.071	U		
TETRYL	NE	240.0	244.0	0.15	U	0.16	U	0.06	U	0.06	U	0.059	U	0.062	U	0.071	U		
METALS (mg/kg)																			
ALUMINUM	13722	77000	78000	**6460**		**6990**		**7270**		**8450**		**6820**		**5580**		**10600**			
ANTIMONY	1.6	31	31.3	8.9	U	9.2	U	0.97	U	0.95	U	1	U	0.88	U	1.1	U		
ARSENIC	3.7	0.39	3.90	**1.7**	J	**1.9**	J	**1.9**	J	**1.7**	J	**1.9**	J	**1.2**	J	**2.1**	J		
BARIUM	169	15000	15600	**62.7**	J	**58.8**	J	**64.8**	J	**72.5**	J	**131**		**56.8**	J	**77.3**	J		
BERYLLIUM	1.6	160	156	**0.3**	J	**0.32**	J	0.48	U	0.47	U	0.52	U	0.44	U	0.53	U		
CADMIUM	0.3	70	70.3	1.8	U	1.8	U	0.48	U	0.47	U	0.52	U	0.44	U	0.53	U		
CALCIUM	317332	NE	NE	**147000**		**132000**		**110000**		**87100**		**264000**		**207000**		**88900**			
CHROMIUM[d]	25	117000	117000	**5.7**		**6.3**		**6.7**		**8.4**		**5.9**		**5.7**		**9.7**			
COBALT	7.7	23	NE	**2.6**	J	**2.6**	J	**2.6**	J	**2.7**	J	**2.1**	J	**2.1**	J	**3.8**	J		
COPPER	13	3100	3130	**5.7**	J	**5.6**	J	**4.9**	J	**6.1**	J	**3.2**	J	**5.4**	J	**7.3**	J		
IRON	23049	55000	54800	**5740**		**6270**		**6450**		**7690**		**5630**		**5230**		**9860**			
LEAD	10.9	400	400	**7.1**	J	**6.3**	J	**2.8**	J	**4.3**	J	**4.3**	J	**3.2**	J	**6.1**	J		
MAGNESIUM	16991	NE	NE	**3480**		**3690**		**3080**		**3940**		**4470**		**5570**		**4760**			
MANGANESE	393	1800	1860	**123**		**131**		**118**		**143**		**63.8**		**117**		**203**			
MERCURY	10.8	10	15.6	**0.0072**	J	**0.005**	J	0.0094	U	0.0092	U	0.011	U	0.0095	U	0.014	J		
NICKEL	17.4	1500	1560	**5.9**	J	**7.2**	J	**5.7**	J	**6.5**	J	**5.4**	J	**4.9**	J	**8.2**	J		
POTASSIUM	5077	NE	NE	**1620**	J	**1750**	J	**1920**	J	**2250**	J	**1530**	J	**1670**	J	**2920**	J		
SELENIUM	1.4	390	391	8.9	U	9.2	U	1.9	U	1.9	U	2.1	U	1.8	U	2.1	U		
SILVER	1.1	390	391	4.4	U	4.6	U	0.48	U	0.47	U	0.52	U	0.44	U	0.53	U		
SODIUM	5196	NE	NE	**248**	J	**296**	J	530	U	520	U	570	U	490	U	580	U		
THALLIUM	1.3	0.78	0.782	4.4	U	4.6	U	1.3	U	1.2	U	1.3	U	1.1	U	1.4	U		
VANADIUM	42.6	390	391	**11.5**	J	**12.3**	J	**13.9**	J	**14.5**	J	**17.1**	J	**11.9**	J	**19.3**	J		
ZINC	54.6	23000	23500	**18.9**		**21.3**		**18.7**		**23.1**		**13.7**		**15.8**		**32.4**			

Risk Additivity Evaluation at Building 308, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio	
EXPLOSIVES (mg/kg)					
1,3,5-TRINITROBENZENE		ND			
1,3-DINITROBENZENE		ND			
2,4,6-TRINITROTOLUENE		ND			
2,4-DINITROTOLUENE		ND			
2,6-DINITROTOLUENE		ND			
2-AMINO-4,6-DINITROTOLUENE		ND			
2-NITROTOLUENE		ND			
3-NITROTOLUENE		ND			
4-AMINO-2,6-DINITROTOLUENE		ND			
4-NITROTOLUENE		ND			
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE		ND			
NITROBENZENE		ND			
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE		ND			
TETRYL		ND			
METALS (mg/kg)					
ALUMINUM	N	10600		0.135897	
ANTIMONY		ND			
ARSENIC	C	2.1	5.39E-06		
BARIUM	N	131		0.008397	
BERYLLIUM	N	0.032		0.000205	
CADMIUM		ND			
CALCIUM		264000		nutrient	
CHROMIUMd	N	9.7		0.000083	
COBALT	N	3.8		0.17	RSL
COPPER	N	7.3		0.002332	
IRON	N	9860		0.179927	
LEAD	N	7.1		0.017750	
MAGNESIUM		5570		nutrient	
MANGANESE	N	203		0.109140	
MERCURY	N	0.014		0.000896	
NICKEL	N	8.2		0.005256	
POTASSIUM		2920		nutrient	
SELENIUM		ND			
SILVER		ND			
SODIUM		296		nutrient	
THALLIUM		ND			
VANADIUM	N	19.3		0.049352	
ZINC	N	32.4		0.001379	

Risk Additivity
Soil Analytical Data
Building 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC530-CS-0001-101812		OTC530-CS-0002-101812		OTC530-IS-0001-071712		OTC530-IS-0002-071712-FD		OTC530-IS-0004-071712		OTC530-IS-0006-082912		OTC530-IS-0007-082912	
			Sample Date	10/18/2012		10/18/2012		7/17/2012		7/17/2012		7/17/2012		8/29/2012		8/29/2012	
			Location	CON1, under tank		CON2, under tank		Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 3, MW-01		Station 3, MW-01	
			Depth (ft bgs)	6 - 6.25		6 - 6.25		3 - 5		3 - 5		7 - 9		0 - 2		3 - 5	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																	
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.022	U	0.022	U	0.0077	U	0.0075	U	0.0089	U	0.0081	U	0.0079	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.022	U	0.022	U	0.0097	U	0.0094	U	0.011	U	0.01	U	0.0099	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.022	U	0.022	U	0.0097	U	0.0094	U	0.011	U	0.01	U	0.0099	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.022	U	0.022	U	0.0077	U	0.0075	U	0.0089	U	0.0081	U	0.0079	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.022	U	0.022	U	0.0077	U	0.0075	U	0.0089	U	0.0081	U	0.0079	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.022	U	0.022	U	0.0077	U	0.0075	U	0.0089	U	0.0081	U	0.0079	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.022	U	0.022	U	0.0077	U	0.0075	U	0.0089	U	0.0081	U	0.0079	U
PETROLEUM HYDROCARBONS (mg/kg)																	
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	5.3	U	5.4	U	3	U	3.3	U	3.4	U	3.2	U	2.5	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	11	U	11	U	**10.1**		**7.52**	J	4.6	U	**38.1**		7.9	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000	**10.5**	J	**19.4**		**41.5**		**33.4**		4.6	U	**116**		**68.6**	
CYANIDE (mg/kg)																	
CYANIDE	NE	22.0	46.9	0.15	U	0.15	U	0.067	U	0.067	U	0.082	U	0.074	U	0.07	U
TRITIUM (pCi/g)																	
TRITIUM	NE	NE	NE	4.45	U	4.6	U	4.25	U	4.29	U	4.14	U	4.17	U	4.07	U

Risk Additivity Evaluation at Building 308, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
PCBs (mg/kg)				
PCB-1016 (AROCLOR 1016)		ND		
PCB-1221 (AROCLOR 1221)		ND		
PCB-1232 (AROCLOR 1232)		ND		
PCB-1242 (AROCLOR 1242)		ND		
PCB-1248 (AROCLOR 1248)		ND		
PCB-1254 (AROCLOR 1254)		ND		
PCB-1260 (AROCLOR 1260)		ND		
PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10		ND		
DIESEL RANGE ORGANICS C10-C28		38.1		0.038100
OIL RANGE ORGANICS C28-C40		116		0.116000
CYANIDE (mg/kg)				
CYANIDE		ND		
TRITIUM (pCi/g)				
TRITIUM		ND		
		SUM =	***5.4E-06***	***0.8***

Risk Additivity
Soil Analytical Data
Buidling 308 (OT-C530) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

CON = confirmation sample
dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Final

RCRA Facility Investigation Report
Group 1 – Buildings 920, 921, 922 (OT-C531A, OT-C531B, OT-C531C)
Holloman Air Force Base, New Mexico

Prepared for U.S. Air Force Civil Engineer Center
2261 Hughes Ave., Suite 155
Lackland Air Force Base, Texas 78236-9861

Prepared by Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

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Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)

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Acronyms and Abbreviations

AFB	Air Force Base
bgs	below ground surface
COPC	constituent of potential concern
DPT	direct push technology
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
ESL	ecological screening level
ft	foot/feet
GPR	ground-penetrating radar
GRO	gasoline range organics
HI	hazard index
HQ	hazard quotient
IDW	investigation-derived waste
LANL	Los Alamos National Laboratory
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MCL	maximum contaminant level
MDL	method detection limit
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
ORO	oil range organics
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RfD	reference dose
RFI	RCRA Facility Investigation
RSL	Regional Screening Level
Shaw	Shaw Environmental & Infrastructure, Inc. (a CB&I Company)
SLERA	screening-level ecological risk assessment
SSL	soil screening level
SVOC	semivolatile organic compound
TAL	target analyte list
TDS	total dissolved solids
TPH	total petroleum hydrocarbons
UCL	upper confidence limit
VOC	volatile organic compound
WQS	water quality standards

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1.0 INTRODUCTION

Shaw Environmental & Infrastructure. Inc. (Shaw), a CB&I company, prepared this Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for the Air Force Civil Engineer Center (formerly the Air Force Center for Engineering and the Environment) under Contract No. FA8903-09-D-8580, Task Order No. 0013, Modification 01. Results presented in this report are from the investigation and corrective measures of the inactive septic tank located at Buildings 920 (OT-C531A), 921 (OT-C531B), and 922 (OT-C531C) at Holloman Air Force Base (AFB), New Mexico, which were part of the fifteen Group 1 septic tank sites under the Midwestern Region Performance-Based Remediation Contract. This RFI Report has been prepared pursuant to the requirements of the Holloman AFB Hazardous Waste Facility RCRA Permit No. NM6572124422 (the Permit) (New Mexico Environment Department [NMED], 2004). The purpose of this RFI was to delineate potential contamination that may have been released to the environment from the septic tank systems at Buildings 920, 921, and 922.

Holloman AFB is situated in south-central New Mexico in the northwest central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). The 15 Group 1 former septic tank sites are located throughout Holloman AFB (Figure 1-2). Each former septic tank is positioned adjacent to a building; as a result, each septic tank is named in reference to its most proximal building, as follows: OT-C530 (Building 308), OT-C531 (Buildings 920, 921, and 922), OT-C532 (Building 924), OT-C533 (Building 1190), OT-C534 (Building 1194), OT-C535 (Building 1196), OT-C536 (Building 1199), OT-C537 (Building 1200), OT-C538 (Building 1201), OT-C539 (Building 1221), OT-C540 (Building 1251), OT-C541 (Building 1269), OT-C542 (Building 1166), OT-C543 (Building 1175), and OT-C544 (Building 1176). This report presents a summary of the RFI work conducted at abandoned septic tanks site OT-C531 at Buildings 920, 921, and 922.

Buildings 920, 921, and 922 were constructed in 1959 for ammunition assembly, primarily for bolting rocket components together before use. All three 1,900-square foot (ft) buildings are vacant and empty. The Septic Tanks Report indicates that each building contained a toilet and a lavatory which discharged to the septic system. All three septic tanks were abandoned in place in January 2008 by opening each tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill (North Wind Inc., 2008, also included in Appendix A).

1.1 Purpose of the Investigation

Investigative activities were undertaken at Holloman AFB to determine the nature and extent of contamination and propose recommendations for either closure or additional corrective

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action, if necessary, at 15 inactive, abandoned, or removed septic tank systems, following the general guidance for closing septic systems found in 20.7.3.307 New Mexico Administrative Code (NMAC) Standards – Abandoned Sewers and On-Site Liquid Waste Systems.

Project quality objectives for each septic tank site consisted of the following:

- Gather and review all site historical information
- Identify septic tank components and historical uses
- Remove septic tank contents and contaminated soil (where necessary), and abandon the tank (where necessary)
- Determine the nature and extent of residual constituents of concern at each site, including potential pathways to groundwater
- Evaluate the risk at each site
- Develop conclusions and recommendations for each site.

This RFI Report presents the data collected to meet these project quality objectives at the Buildings 920, 921, and 922 abandoned septic tank.

1.2 Scope of Activities

This RFI Report describes all activities associated with the septic tank investigation at Buildings 920, 921, and 922, including soil boring advancement, soil sample collection, monitoring well installation, groundwater sampling, and sample analysis. All work was performed in accordance with the *Holloman AFB Basewide Septic Tank Solid Waste Management Unit RFI Work Plan* (U.S. Army Corps of Engineers [USACE], 2010) and the *Quality Program Plan* (Shaw, 2012a). The *Quality Program Plan* (Shaw, 2012a) contains the Site Safety and Health Plan; the Uniform Federal Policy – Sampling and Analysis Plan/Quality Assurance Project Plan; and the Construction Quality Plan, which defines the methodology and practices that were used to control construction work during the performance of the RFI.

1.3 Regulatory Setting

The Permit (NMED, 2004) established the general and specific standards and activities for managing hazardous waste pursuant to Subtitle C of RCRA, the New Mexico Hazardous Waste Act, and the New Mexico Hazardous Waste Management Regulations. The Permit also set forth requirements for investigation, notification, corrective action, and reporting for the storage, management, and releases of hazardous wastes.

The 15 septic systems were either inactive or previously removed as indicated in *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) report (Appendix A), and were not listed in the Permit (NMED, 2004). The *RFI Work Plan* (USACE, 2010) was approved by NMED in a letter dated January 13, 2010 (NMED, 2010). The NMED-approved *RFI Work Plan* (USACE, 2010) contained investigation activities only; therefore Shaw submitted a *Final Voluntary Corrective Measures Request – Septic Tanks Sites* (Shaw, 2012b) to include remediation and closure tasks that addressed septic system abandonment using 20.7.3.307 NMAC (Abandoned Sewers and On-Site Liquid Waste Systems). NMED has primary regulatory responsibility for the septic system sites; therefore corrective action must be performed under Title 20 NMAC.

The septic tank investigations were based on action/cleanup levels stipulated in Appendix 4-F of the Permit to be protective of human health and the environment. Permit Appendix 4-F specifies that soil contaminant concentrations be compared with the NMED residential soil screening levels (SSL), as presented in the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a), or the *U.S. Environmental Protection Agency (EPA) Regions 3, 6, and 9 Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites* (EPA, 2012a) if no NMED SSL has been established. Holloman AFB also has NMED-approved background concentrations for metals in soil (NMED, 2012b).

For groundwater, the Permit specifies that the more stringent of either the New Mexico Water Quality Control Commission (NMWQCC) water quality standards (WQS) (20.6.2 NMAC), or the EPA maximum contaminant levels (MCLs) for drinking water, be used for comparison with measured sample concentrations (EPA, 2012b).

1.4 RFI Report Organization

This RFI Report is organized into the following sections:

- **Section 1.0, Introduction:** identifies the objectives and purpose of this report.
- **Section 2.0, Environmental Setting**: provides pertinent descriptions of history, location, physiography, topography, surface water, hydrology, regional geology, soil types, regional hydrogeology, climate, current and future land use, and current and future water use for Holloman AFB.
- **Section 3.0, Source Characterization**: presents the data collection techniques and locations as well as analytical methods.

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- **Section 4.0, Investigation Results and Evaluation**: details the soil analytical results and evaluates human health and ecological risk.
- **Section 5.0, Data Quality Assurance and Data Quality Control Review**: summarizes the analytical data validation results.
- **Section 6.0, Conclusions and Recommendations**: presents the conclusions and recommendations of this RFI report.
- **Section 7.0, References**: lists the references cited in this report.

In addition to the figures and tables listed in the table of contents, the following appendices are included in this report:

- **Appendix A** – Historical Records
- **Appendix B** – Photographic Log
- **Appendix C** – Geophysical Report
- **Appendix D** – Sample Collection Logs
- **Appendix E** – Boring Logs
- **Appendix F** – Well Construction Diagrams
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- **Appendix K** – Risk Evaluation Calculations
- **Appendix L** – Ecological Evaluation.

2.0 ENVIRONMENTAL SETTING

This section provides background information for Holloman AFB including physical setting, history, topography, climate, soils, geology, hydrology, and land and water use.

2.1 Physical Setting

Holloman AFB is situated in south-central New Mexico, in the northwest-central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). Holloman AFB has a population of 6,000, and occupies 59,639 acres in the northeast quarter of Section 1, Township 17 South, Range 8 East. The White Sands Missile Range testing facilities occupy additional land extending northward from the base. Privately- and publicly-owned lands border the remainder of Holloman AFB. The major highway servicing Holloman AFB is Highway 70, which runs southwest from the town of Alamogordo, New Mexico, and separates Holloman AFB from publicly owned lands to the south. Alamogordo, New Mexico which has a population of 30,401 according to the 2010 U.S. Census, is located approximately 7 miles east of the base.

2.2 Holloman Air Force Base History

Holloman AFB was first established in 1942 as Alamogordo Army Air Field. From 1942 through 1945, Alamogordo Army Air Field served as the training grounds for over 20 different flight groups, flying primarily B-17s, B-24s, and B-29s. After World War II, most operations had ceased at the base. In 1947, Air Material Command announced the air field would be its primary site for the testing and development of unmanned aircraft, guided missiles, and other research programs. On January 13, 1948, the Alamogordo installation was renamed in honor of the late Colonel George V. Holloman, a pioneer in guided missile research. In 1968, the 49th Tactical Fighter Wing arrived at Holloman AFB, and has remained since. Today, Holloman AFB also serves as the training center for the German Air Force's Tactical Training Center.

2.3 Physiography and Topography

Holloman AFB is located within the Sacramento Mountains physiographic province on the western edge of the Sacramento Mountains. The base is approximately 59,600 acres in area, and is located at a mean elevation of 4,093 ft above mean sea level. The region is characterized by high tablelands with rolling summit plains; cuesta-formed mountains dipping eastward; and west-facing escarpments, with the wide bracketed basin forming the basin and range complex. Holloman AFB is located in the Tularosa Basin, which is part of the Central Closed Basins. The bordering mountains rise abruptly to altitudes of 7,000 to 12,000 ft above mean sea level. The San Andres Mountains bound the basin to the west

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(approximately 30 miles) with the Sacramento Mountains approximately 10 miles to the east (Figure 2-1). At its widest, the basin is approximately 60 miles east to west, and stretches approximately 150 miles north to south.

2.4 Climate

As a whole, New Mexico has a mild, arid to semiarid continental climate characterized by light precipitation totals, abundant sunshine, relatively low humidity, and relatively large annual and diurnal temperature ranges (Western Regional Climate Center, 2013). The climate of the Central Closed Basins varies with elevation. The base is located in the low areas and is characterized by warm temperatures and dry air. Daytime temperatures often exceed 100 degrees Fahrenheit in the summer months, and are in the middle 50s (degrees Fahrenheit) in the winter. A preponderance of clear skies and relatively low humidity permits rapid nighttime cooling resulting in average diurnal temperature ranges of 25 to 35 degrees Fahrenheit. Potential evapotranspiration, at 67 inches per year, significantly exceeds annual precipitation, usually less than 15 inches. Arid conditions resulting from very low rainfall amounts, coupled with the topographically induced wind patterns combining with the sparse vegetation, tend to cause localized “dust devils.” The annual rainfall for Alamogordo is 12 inches per year. Much of the precipitation falls during the midsummer monsoonal period (July and August) as brief, yet frequent, intense thunderstorms culminating in 30 to 40 percent of the total annual rainfall.

2.5 Regional Geology and Soils

2.5.1 Geology

The sedimentary rocks that make up the adjacent mountain ranges are between 250 and 500 million years old (New Mexico Bureau of Geology and Mineral Resources, 2012). During the period when the area was submerged beneath the shallow intracontinental sea, the layers of limestone, shale, gypsum, and sandstone were formed. In time, these layers were pushed upward through various tectonic forces forming a large bulge on the surface. Approximately 10 million years ago, the center began to subside resulting in a vertical drop of thousands of ft, leaving the edges still standing (the present-day Sacramento and San Andres mountain ranges). In the millions of years following, rainfall, snowmelt, and wind eroded the mountain sediments depositing them in the valley (i.e., Tularosa Basin). Water carrying eroded limestone, dolomite, gravel, and other materials continue to flow into the basin.

As the Tularosa Basin is a bolson, which is a basin with no surface drainage outlet, sediments carried by surface water into a closed basin are bolson deposits. The overlying alluvium generally consists of unconsolidated gravels, sands, and clays. Soils in the basin are derived from the adjacent ranges as erosional deposits of limestone, dolomite, and gypsum. A fining

sequence from the ranges towards the basin's center characterizes the area with the near-surface soils as alluvial, eolian, and lacustrine deposits. The alluvial fan deposits are laterally discontinuous units of interbedded sand, silt, and clay while the eolian deposits consist primarily of gypsum sands. The eolian and alluvial deposits are usually indistinguishable due to the reworking of the alluvial sediment by eolian processes. The playa, or lacustrine deposits, consist of clay containing gypsum and are contiguous with the alluvial fan and eolian deposits throughout the base. Stiff caliche layers, varying in thickness, have been identified at different areas of the base.

2.5.2 Soils

The U.S. Natural Resources Conservation Service (formerly the Soil Conservation Service) has identified two soil associations in the vicinity of Holloman AFB: (1) the Holloman-Gypsum Land-Yesum Complex and (2) the Mead silty clay loam (Figure 2-2) (U.S. Department of Agriculture, 1981). The permeability of these horizons ranges from 4×10^{-4} to 1×10^{-3} centimeters per second.

The Holloman-Gypsum Land-Yesum Complex, 0 to 5 percent sloped soil, consists of larger areas of shallow and deep, well-drained soils and areas of exposed gypsum. The Holloman soil makes up approximately 35 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 13 inches of the substratum is pink, very fine sandy loam that is very high in gypsum. Below that, the substratum is white gypsum to a depth of more than 60 inches. This soil is calcareous and mildly alkaline to moderately alkaline. Permeability is moderate. Available water capacity is very low.

Gypsum Land makes up approximately 30 percent of the Holloman-Gypsum Land-Yesum Complex (0 to 5 percent slopes). Typically, less than 1 inch of very fine sandy loam overlies soft to hard, white gypsum. The deep Yesum consists of very fine sandy loam that makes up approximately 20 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 9 inches of the substratum is light brown, fine sandy loam that is very high in gypsum. Below that, the substratum is pink, very fine sandy loam to a depth of more than 60 inches. The soil is calcareous throughout, and is mildly alkaline. Permeability is moderate. Available water capacity is moderate. Many fine gypsum crystals are found throughout the profile.

The soil type found across the main drainage area for the installation is Mead silty clay loam, 0 to 1 percent slopes. This deep, poorly drained, nearly level soil is on outer fringes of alluvial fans. This soil formed in fine textured alluvium over lacustrine lake sediment. It is very high in salt content because of periodic flooding and poor drainage. Slopes are smooth and concave. Typically, the surface layer is reddish brown, silty clay loam, and clay loam

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approximately 5 inches thick. The substratum, to a depth of 48 inches, is light reddish brown clay with a high salt content. Below that, the substratum is lacustrine material of variable texture and color to a depth of more than 60 inches. Included within this soil are areas of Holloman soils and Gypsum Land along the margins of the unit of steep, short gully sides and knolls. These inclusions make up approximately 15 percent of the map unit for this soil type. Individual areas are generally smaller than 10 acres. This soil is moderately calcareous throughout and is moderately to strongly alkaline. It has a layer of salt that is more soluble than gypsum. Permeability is very low. Available water capacity is low (USACE, 2010).

2.6 Regional Hydrogeology

Groundwater occurs as an unconfined aquifer in the unconsolidated deposits of the central basin, with the primary source of recharge as rainfall percolation and minor amounts of stream runoff along the western edge of the Sacramento Mountains. Surface water/rainfall migrates downward into the alluvial sediments at the edge of the shallow aquifer near the ranges and flows through progressively finer-grained sediments towards the central basin. Because the Tularosa Basin is a closed system, water that enters the area leaves either through evaporation or percolation. This elevated amount of percolation results in a fairly high water table. Beneath Holloman AFB, groundwater ranges from 5 to 50 ft below ground surface (bgs). Flow for the base is generally towards the southwest with localized influences from the variations in the topography of the base (Figure 2-3). In the northern and western portions of the base, groundwater flows more to the west towards the Ritas Draw, Malone Draw, and Lost River drainages. Groundwater flow is affected by local topography in areas immediately adjacent to arroyos, where groundwater flows directly toward the drainages regardless of the regional flow pattern.

Groundwater in the Tularosa Basin is of potable quality at the recharge areas in close proximity to the Sacramento Mountains and becomes increasingly mineralized toward the central portion of the basin and discharge areas. The majority (over 70 percent) of the Environmental Restoration Program sites located across Holloman AFB have groundwater monitoring wells containing water with an average total dissolved solids (TDS) concentration greater than 10,000 milligrams per liter (mg/L). These TDS data support the hypothesis that TDS concentrations below 10,000 mg/L at Holloman AFB are caused by dilution of natural groundwater quality from leaking water lines and surface irrigation from the domestic water supply. TDS concentrations greater than 10,000 mg/L exceed the NMWQCC limit as potable water (20.6.2 NMAC), and thus, the groundwater beneath Holloman AFB has been designated as unfit for human consumption. Likewise, the EPA guidelines have identified the groundwater as a Class IIIB water source, characterized by TDS concentrations exceeding 10,000 mg/L, and is characterized by a low degree of interconnection with adjacent surface water or groundwater of a higher class. Groundwater

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does not discharge or connect to any adjacent aquifers, because the Tularosa Basin is a closed basin. Adjacent surface waters include Lost River and Lake Holloman, which also have high concentrations of TDS, and are not considered potential drinking water sources.

2.7 Surface Water and Hydrology

The Tularosa Basin contains all of the surface flow in its boundaries. The nearest inflow of surface waters to Holloman AFB comes from the Lost River, located in the north-central region of the base. The upper reaches of the Three Rivers and the Sacramento River are perennial in the basin. Holloman AFB is dissected by several southwest-trending arroyos that control the surface drainage. Hay Draw arroyo is located in the far north. Malone and Ritas Draws, which drain into the Lost River and Dillard Draw arroyos, are located along the eastern perimeter of the base. Approximately 10,000 years ago, indications are that a much wetter climate existed. The present-day Lake Otero encompassed a much larger area, possibly upwards of several hundred square miles. Its remains are the Alkali Flat and Lake Lucero. Lake Lucero is a temporary feature of merely a few inches in depth during the rainy season.

Ancient lakes and streams deposited water-bearing deposits over the older bedrock basement materials. Fractures, cracks, and fissures in the Permian and Pennsylvanian bedrock yield small quantities of relatively good-quality water in the deeper peripheral. Potable water is only found from wells near the edges of the basin, with more saline water towards the center. Two of the principal sources of potable water are: (1) a long narrow area on the upslope sides of Tularosa and Alamogordo, and (2) in the far southwestern part of the basin. A portion of the city of Alamogordo's water, as well as Holloman AFB's water, is supplied from Bonito Lake (which is in the Pecos River Basin).

2.8 Current and Future Land Use

The land surrounding Holloman AFB consists of residential areas to the east and northeast (city of Alamogordo, New Mexico), rangeland to the south, the White Sands National Monument to the west, and areas where military activities are conducted to the north. The desert terrain of the area immediately surrounding Holloman AFB has limited development, and there are no agricultural operations, residential communities, or large industrial operations located adjacent to the base. The Boles Well Field, a freshwater source for Holloman AFB, is located approximately 6 miles to the southeast of the base. Holloman AFB is an active military installation and is expected to remain active for the foreseeable future. No transfer of military property to the public is anticipated, and public access to the base is restricted. Future land use is not expected to differ significantly from current land use practices (Foster Wheeler Environmental Corporation, 2002).

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2.9 Current and Future Water Use

At present, Holloman AFB receives approximately 50 percent of its freshwater supply from the Boles Well Field. An additional freshwater resource for Holloman AFB, and for the city of Alamogordo, is Bonito Lake, located 60 miles northeast of the Tularosa Basin. Currently, there are no potable supplies of groundwater or surface water located on the base because of poor groundwater quality with TDS concentrations greater than 10,000 mg/L).

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3.0 SOURCE CHARACTERIZATION

This section presents the overall technical approach in general accordance with the *RFI Work Plan* (USACE, 2010) (except where otherwise noted) and details the investigative activities that were implemented at Buildings 920, 921, and 922.

The primary environmental media of concern at these buildings are soil and groundwater. The extent of contamination in soil was expected to be relatively local to the inactive septic tank location. Therefore, the basic approach was to identify each abandoned septic tank location and then sample at the individual features of the septic tank systems in characterizing the soil. To evaluate the potential impacts to groundwater, a monitoring well was installed in the downgradient end of each leach field. The analytical programs for both soil and groundwater focused on the expected nature of contamination likely to be associated with septic tank discharges.

The RFI conducted at removed septic tank OT-C531A, -C531B, and -C531C (Buildings 920, 921, and 922) was initiated as part of the Midwestern Region Performance-Based Remediation Contract. The *RFI Work Plan* (USACE, 2010) for this site included the following field work activities: pre-mobilization and mobilization/site setup activities, soil boring advancement, soil sample collection, monitoring well installation and development, groundwater sample collection, sample analysis, investigation-derived waste (IDW) management, and land surveying. Appendix B is a photographic log of numerous investigation activities, from the initial site layout to monitoring well installation and sample collection.

3.1 Pre-mobilization/Mobilization Activities

Several pre-investigation documents were filed and approvals obtained, as follows:

- Civil Engineer Work Request (Air Force Form 332) approval
- Base digging permits (Air Force Form 103, Base Civil Engineering Work Clearance Request) with utility clearances
- Site security clearances
- Facility manager notification of the intended operations.

Prior to the start of activities, a pre-investigation kick-off meeting and site walk-through were conducted with the Air Force Civil Engineer Center resident engineer, Holloman AFB personnel, and Shaw's Construction Manager, to plan for equipment access, equipment

staging, decontamination area layout, potential site hazards, emergency evacuation routes, and project schedule.

Prior to the submittal of the base digging permits, the drilling locations were delineated using marker flags, stakes, and paint. Utility clearance approvals were completed by the appropriate Holloman AFB utility office (i.e., telephone, sewer, water, natural gas, etc.), and by the New Mexico One Call utility clearance system. Upon receipt of the approved digging permit and utility clearances, Shaw's Construction Manager completed a site walk-through to confirm the utility and intrusive work locations. In addition, Shaw performed a site survey prior to the start of drilling activities to search for signs of other buried or overhead utilities.

3.2 Geophysical Investigation

A geophysical investigation was performed at Buildings 920, 921, and 922 in an attempt to define the limits of the inactive and abandoned septic systems. Methods employed included: visual inspection, electromagnetic induction conductivity detection, ground-penetrating radar (GPR), and electromagnetic pipe and cable location.

Electromagnetic induction conductivity detection ground induction methods are employed to detect broad metal mass anomalies or conductive zones that may be indicative of potential septic tanks, and lateral changes in conductive zones of soil or backfill materials relative to native soil. GPR is used to detect inactive septic tank excavation sidewalls and fill areas. An electromagnetic pipe and cable survey was conducted to detect buried utility lines.

Electromagnetic and GPR surveys were conducted at Buildings 920, 921, and 922 in June 2012. The locations of the abandoned septic tanks were identified, as were underground utility lines, the septic tank influent lines, the septic tank effluent lines, and the septic tank leach fields for later reference during soil boring activities. The locations of the individual leach field piping could not be directly detected by the geophysical survey due to the similarity of composition of the clay pipes and the surrounding soil. However, the leach field could be identified by the geophysical survey equipment due to the differences in mineralization and conductivity between the native soil and the soils that were physically affected by normal leach field operation. The presence of the leach field piping was assumed within the leach field as identified by the geophysical survey which allowed for representative soil and groundwater sample collection. The geophysical investigation findings are shown on Figures 3-1a, 3-1b, and 3-1c. The complete geophysical report is included in Appendix C.

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3.3 Soil Investigation

3.3.1 Building 920

The soil investigation of the abandoned septic tank at Building 920 was conducted on July 10, 2012. The program consisted of sampling four borings advanced at the former septic tank location, as shown on Figure 3-1a. Soil boring OT-C531A-Station 1 (sample numbers OTC531A-IS-0001-071012 and OTC531A-IS-0002-071012) was placed north of the abandoned septic tank location near the inlet line, OT-C531A-Station 2 (sample numbers OTC531A-IS-0003-071012, OTC531A-IS-0004-071012FD, and OTC531A-IS-0005-071012) was placed at the abandoned septic tank location, OT-C531A-Station 3 (samples numbers OTC531A-IS-0006-071012 and OTC531A-IS-0007-071012) was placed south of the abandoned septic tank near the effluent line, and OT-C531A-Station 4 (sample numbers OTC531A-IS-0008-071012, OTC531A-IS-0009-071012, OTC531A-IS-0010-071012, and OTC531A-IS-0011-071012) was placed in the leach field of the abandoned septic tank, at the eventual location of well OTC531A-MW01. All borings were advanced using direct push technology (DPT), with soil samples collected at depths of 3 to 5 ft and 10 to 12 ft at OT-C531A-Station 1; 7 to 9 ft and 14 to 16 ft at OT-C531A-Station 2; 3 to 5 ft and 10 to 12 ft at OT-C531A-Station 3; and 0 to 2 ft, 3 to 5 ft, 10 to 12 ft, and 11.5 to 13.5 ft at OT-C531A-Station 4 (Appendix D has copies of the sample collection logs). A field duplicate was collected from the 7 to 9 ft depth at OT-C531A-Station 2.

Soil samples were logged in the field in accordance with the Unified Soil Classification System requirements, and sample depths were in general accordance with the *Basewide Septic Tank Solid Waste Management Units, RCRA Facility Investigation Work Plan, Holloman AFB, New Mexico* (USACE, 2010). Soil samples were not screened with a photoionization detector since there was no sensory evidence of contamination. Appendix E has copies of the soil boring logs.

Soil samples for volatile organic compound (VOC) analysis were collected in accordance with EPA Method 5035, using a TerraCore® Sampler device (EPA, 1986), while non-VOC sample aliquots were placed in laboratory-provided containers. Samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), explosives, polychlorinated biphenyls (PCBs), target analyte list (TAL) metals, total petroleum hydrocarbons (TPH)-gasoline range organics (GRO), TPH-diesel range organics (DRO), TPH-oil range organics (ORO), cyanide, percent solids, and tritium by Accutest Laboratories, Inc., a National Environmental Laboratory Accreditation Program-accredited laboratory, using EPA analytical methods, as summarized on Table 3-1.

The excess sample core soil extracted using the DPT drilling method was placed in 55-gallon drums for later characterization and transport to a licensed disposal facility. The boreholes

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were abandoned upon completion by plugging from the bottom of the borehole to ground surface using bentonite pellets, then patched with cement to match the surrounding land surface contour. Soil boring equipment was decontaminated between borings as detailed in Holloman AFB Standard Operating Procedure 2, "Sampling Equipment Decontamination" in Appendix B of the *RFI Work Plan* (USACE, 2010) and Shaw's Standard Operating Procedure No. EI-FS-014, "Decontamination of Contact Sampling Equipment."

3.3.2 Building 921

The soil investigation of the abandoned septic tank at Building 921 was conducted on July 11, 2012. The program consisted of sampling four borings advanced at the former septic tank location, as shown on Figure 3-1b. Soil boring OT-C531B-Station 1 (sample numbers OTC531B-IS-0001-071112 and OTC531B-IS-0002-071112) was placed north of the abandoned septic tank location near the inlet line, OT-C531B-Station 2 (sample numbers OTC531B-IS-0003-071112, OTC531B-IS-0004-071112FD, and OTC531B-IS-0005-071112) was placed at the abandoned septic tank location, OT-C531B-Station 3 (samples numbers OTC531B-IS-0006-071112 and OTC531B-IS-0007-071112) was placed south of the abandoned septic tank near the effluent line, and OT-C531B-Station 4 (sample numbers OTC531B-IS-0008-071112, OTC531B-IS-0009-071112, OTC531B-IS-0010-071112, and OTC531B-IS-0011-071112) was placed in the leach field of the abandoned septic tank, at the eventual location of well OTC531B-MW01. All borings were advanced using DPT, with soil samples collected at depths of 3 to 5 ft and 10 to 12 ft at OT-C531B-Station 1; 7 to 9 ft and 14 to 16 ft at OT-C531B-Station 2; 3 to 5 ft and 10 to 12 ft at OT-C531B-Station 3; and 0 to 2 ft, 3 to 5 ft, 10 to 12 ft, and second sample collected at a depth of 10 to 12 ft at OT-C531B-Station 4 (Appendix D has copies of the sample collection logs). A field duplicate was collected from the 7 to 9 ft depth at OT-C531B-Station 2.

Soil samples were logged in the field in accordance with the Unified Soil Classification System requirements, and sample depths were in general accordance with the *RFI Work Plan* (USACE, 2010). Soil samples were not screened with a photoionization detector since there was no sensory evidence of contamination. Appendix E has copies of the soil boring logs.

Soil samples for VOC analysis were collected in accordance with EPA Method 5035, using a TerraCore® Sampler device (EPA, 1986), while non-VOC sample aliquots were placed in laboratory-provided containers. Samples were analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium by Accutest Laboratories, Inc., using EPA analytical methods, as summarized on Table 3-1b.

The excess sample core soil extracted using the DPT drilling method was placed in 55-gallon drums for later characterization and transport to a licensed disposal facility. The boreholes were abandoned upon completion by plugging from the bottom of the borehole to ground

surface using bentonite pellets, then patched with cement to match the surrounding land surface contour. Soil boring equipment was decontaminated between borings as detailed in Holloman AFB Standard Operating Procedure 2, "Sampling Equipment Decontamination" in Appendix B of the *RFI Work Plan* (USACE, 2010) and Shaw's Standard Operating Procedure No. EI-FS-014, "Decontamination of Contact Sampling Equipment."

3.3.3 Building 922

The soil investigation of the abandoned septic tank at Building 922 was conducted on July 13, 2012. The program consisted of sampling four borings advanced at the former septic tank location, as shown on Figure 3-1c. Soil boring OT-C531C-Station 1 (sample numbers OTC531C-IS-0001-071312 and OTC531C-IS-0002-071312) was placed north of the abandoned septic tank location near the inlet line, OT-C531C-Station 2 (sample numbers OTC531C-IS-0003-071312, OTC531C-IS-0004-071312FD, and OTC531C-IS-0005-071312) was placed at the abandoned septic tank location, OT-C531C-Station 3 (sample numbers OTC531C-IS-0006-071312 and OTC531C-IS-0007-071312) was placed west of the abandoned septic tank near the effluent line, and OT-C531C-Station 4 (sample numbers OTC531C-IS-0008-071312, OTC531C-IS-0009-071312, OTC531C-IS-0010-071312, and OTC531C-IS-0011-071312) was placed in the leach field of the abandoned septic tank, at the eventual location of well OTC531C-MW01. All borings were advanced using DPT, with soil samples collected at depths of 3 to 5 ft and 10 to 12 ft at OT-C531C-Station 1; 7 to 9 ft and 14 to 16 ft at OT-C531C-Station 2; 3 to 5 ft and 10 to 12 ft at OT-C531C-Station 3; and 0 to 2 ft, 3 to 5 ft, 10 to 12 ft, and second sample collected at a depth of 10 to 12 ft at OT-C531C-Station 4 (Appendix D has copies of the sample collection logs). A field duplicate was collected from the 7 to 9 ft depth at OT-C531C-Station 2.

Soil samples were logged in the field in accordance with the Unified Soil Classification System requirements, and sample depths were in general accordance with the *RFI Work Plan* (USACE, 2010). Soil samples were not screened with a photoionization detector since there was no sensory evidence of contamination. Appendix E has copies of the soil boring logs.

Soil samples for VOC analysis were collected in accordance with EPA Method 5035, using a TerraCore® Sampler device (EPA, 1986), while non-VOC sample aliquots were placed in laboratory-provided containers. Samples were analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium by Accutest Laboratories, Inc., using EPA analytical methods, as summarized on Table 3-1c.

The excess sample core soil extracted using the DPT drilling method was placed in 55-gallon drums for later characterization and transport to a licensed disposal facility. The boreholes were abandoned upon completion by plugging from the bottom of the borehole to ground surface using bentonite pellets, then patched with cement to match the surrounding land

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surface contour. Soil boring equipment was decontaminated between borings as detailed in Holloman AFB Standard Operating Procedure 2, "Sampling Equipment Decontamination" in Appendix B of the *RFI Work Plan* (USACE, 2010) and Shaw's Standard Operating Procedure No. EI-FS-014, "Decontamination of Contact Sampling Equipment."

3.4 Groundwater Investigation

3.4.1 Building 920

One monitoring well was installed at Building 920 to determine impact to groundwater. Well OTC531A-MW01 was installed in the leach field of the abandoned septic tank, as shown on Figure 3-1a. Groundwater sampling was conducted at the Building 920 monitoring well on July 17, 2012. A second attempt at groundwater sampling was made on May 16, 2013, but the well was purged dry after removing only 2,500 milliliters of standing water and showed no recharge 30 minutes later, therefore no groundwater sample was collected.

3.4.2 Building 921

One monitoring well was installed at Building 921 to determine impact to groundwater. Well OTC531B-MW01 was installed in the leach field of the abandoned septic tank, as shown on Figure 3-1b. Groundwater sampling was conducted at the Building 921 monitoring well on August 14, 2012 and again on May 15, 2013.

3.4.3 Building 922

One monitoring well was installed at Building 922 to determine impact to groundwater. Well OTC531C-MW01 was installed in the leach field of the abandoned septic tank, as shown on Figure 3-1c. Groundwater sampling was conducted at the Building 922 monitoring well on August 14, 2012.

3.4.4 Well Installation and Sampling

Each monitoring well was installed using hollow-stem auger drilling techniques in accordance with NMED Ground Water Quality Bureau *Monitoring Well Construction and Abandonment Guidelines* (NMED, 2011). The 10-inch borehole was advanced approximately 4 ft into the water table at approximately 14 to 17 ft bgs and completed such that the top of the well screens were set above the approximate level of the groundwater observed during drilling. The monitoring well was constructed of 2-inch-diameter Schedule 40 polyvinyl chloride riser with 2-inch diameter, polyvinyl chloride screen fitted with prepacked, very fine stainless-steel meshing (Appendix F). The screened section of the well was 5 ft long (as opposed to the stipulated 10 ft in the *RFI Work Plan* (USACE, 2010); the variance is based on observed lithology). A silica sand filter pack was placed around the screen to approximately 2 to 3 ft above the top of the screen, with a 2-ft thick bentonite seal

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placed above the filter pack. The remaining annular space was grouted with cement and bentonite.

Each monitoring well was constructed as a "flush-mount" surface completion with a water-tight well vault, locking, expandable well plug, and finished to surrounding grade. Table 3-2 and Appendix F provide monitoring well construction details.

The newly-installed monitoring wells were developed to create an effective filter pack around the well screen, remove fine particles from the formation near the borehole, and assist in restoring the natural water quality of the aquifer in the vicinity of the well. Surging and pumping were both employed to achieve the most effective well development.

Information recorded during well development included water-level measurements, depth-to-bottom measurements, water-quality parameters (pH, temperature, and specific conductance), discharge-water color, water volume, and time period. Well development was performed until the following criteria were met:

- Water removed from the well was visually clear, and the turbidity measures were less than or equal to 10 nephelometric turbidity units. Note that the turbidity criterion was not met in any of the OTC531 wells sampled in July and August 2012, but the other water quality parameters indicated sufficient well development. The turbidity criterion was met during the re-sampling of monitoring well OTC531B-MW01 in May 2013.
- The pH, temperature, and specific conductance parameters were stabilized (less than 10 percent variation for three successive readings).

Groundwater sampling was conducted using low-flow sampling techniques. Water quality indicator parameters were measured and recorded during purging of the monitoring wells (Appendix G) using a field-calibrated water quality meter. Table 3-3 contains final water quality readings from the sampling events. Groundwater samples were collected once indicator parameters had stabilized, and analyzed for VOCs, SVOCs, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium by Accutest Laboratories, Inc.

3.5 Investigation-Derived Waste

The nonhazardous IDW that was generated during the RFI at Buildings 920, 921, and 922 were segregated into the following categories:

- Soil – drill cuttings soil
- Water – decontamination liquids and well purge water.

Upon generation, IDW was properly containerized and temporarily stored at the designated laydown yard, as specified by Holloman AFB. Wastes were contained in sealed, U.S. Department of Transportation–approved, steel 55-gallon drums (for soil cuttings and decontamination water), roll-off containers with liners and covers (for excavated waste soil), and a 1,400-gallon plastic tank (for waste water). The waste soil drums were emptied into 20-cubic-yard roll-off containers, and the waste water was pumped into a bulk plastic tank prior to characterization sampling and analysis for disposal. The drill cuttings were placed into the 20-cubic-yard roll-off containers along with soils from other Holloman AFB investigation sites.

3.6 Site Surveying

Soil borings, monitoring wells, and other site features shown on Figures 3-1a, 3-1b, and 3-1c were surveyed by Albuquerque Surveying Company, Inc. from Albuquerque, New Mexico, a state-licensed surveyor.

Horizontal coordinates are referenced to the North American Datum 1983 State Plane Coordinate System, New Mexico-Central, and surveyed to an accuracy of $\pm$1.0 ft. Vertical elevations are referenced to the North American Vertical Datum 1988 coordinate system to an accuracy of $\pm$0.01 ft. A copy of the site survey results is presented in Appendix H.

3.7 Decontamination Procedures

A decontamination pad was constructed at the designated laydown area for decontamination of all downhole drilling equipment. The drilling rig was decontaminated prior to entering the site. Drilling equipment that came into contact with the borehole was decontaminated by hot-water pressure washing. Disposable equipment used for soil sample collection did not require decontamination.

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4.0 INVESTIGATION RESULTS AND EVALUATION

Soil analytical results presented in this section were used to delineate constituents of concern that may have been released to the environment, and confirm that no additional remedial measures are required.

4.1 Soil Analytical Results

RFI DPT soil boring samples were collected at the Building 920, 921, and 922 locations shown on Figures 3-1a, 3-1b, and 3-1c. All soil samples were sent to Accutest Laboratories, Inc., for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium analyses. Analytical results for the soil samples are presented in Tables 4-1a, 4-1b, and 4-1c. Laboratory analytical data packages, and the data validation checklists for the soil sample data, are provided in Appendix I.

The validated soil analytical results were compared with the NMED residential SSLs (NMED, 2012a), or the EPA RSLs (EPA, 2012a), if NMED residential SSLs have not been established for a given analyte. In addition, a TPH screening level of 1,000 milligrams per kilogram (mg/kg) was used to evaluate the laboratory analytical data. The 1,000 mg/kg action level for petroleum-contaminated soil is the Residential Direct Exposure Limit for unknown oil, listed in Table 6-2, TPH Screening Guidelines for Potable Groundwater, of the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a).

Holloman AFB soil samples contain significant amounts of calcium, typically greater than 100,000 mg/kg (10 percent), and can be as high as 250,000 mg/kg (25 percent). Calcium at these levels contributes spectral interferences during inductively-coupled plasma metals analysis, and can also clog the nebulizer that is used to introduce the sample. Sample dilution is the recommended method for solving both the spectral interference issue and the nebulizer clogging issue. However, sample dilution raises the analytical method detection limits (MDLs) for all associated metals.

A typical method detection limit for thallium during inductively-coupled plasma analysis is 0.13 mg/kg. Diluting by a factor of 5 to 20 to eliminate calcium spectral interference and nebulizer clogging causes the thallium detection limit to be elevated by a factor of 5 to 20. This results in a MDL that is above the NMED residential SSL of 0.782 mg/kg thallium. Consequently, the required remedy to allow for proper equipment operation resulted in MDLs that were above the NMED residential SSL. However, thallium is not an element that is anticipated to be present at Buildings 920, 921, or 922 as a result of normal septic tank operation and maintenance.

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4.1.1 Building 920

No soil samples had detections above the NMED residential SSLs or the Holloman AFB soil background values at Building 920. Likewise, soil samples from all locations and depths had TPH-GRO, TPH-DRO, and TPH-ORO concentrations below the TPH screening level. In addition, no tritium was detected in any of the soil samples. Analytical results for the soil samples are presented in Table 4-1a.

4.1.2 Building 921

No soil samples had detections above the NMED residential SSLs at Building 921. Likewise, soil samples from all locations and depths had TPH-GRO, TPH-DRO, and TPH-ORO concentrations below the TPH screening level. In addition, no tritium was detected in any of the soil samples. Analytical results for the soil samples are presented in Table 4-1b.

Selected metals concentrations exceeded Holloman AFB soil background values, as follows:

- Aluminum exceeded background in samples OTC531B-IS-0006-071112, OTC531B-IS-0008-071112, and OTC531B-IS-0010-071112.
- Copper exceeded background in samples OTC531B-IS-0006-071112 and OTC531B-IS-0010-071112.
- Manganese exceeded background in sample OTC531B-IS-0010-071112.
- Mercury exceeded background in samples OTC531B-IS-0007-071112 and OTC531B-IS-0008-071112.
- Potassium exceeded background in samples OTC531B-IS-0006-071112 and OTC531B-IS-0010-071112.

None of the metals that exceeded Holloman AFB background were present at concentrations above the NMED residential SSLs.

4.1.3 Building 922

No soil samples had detections above the NMED residential SSLs or the Holloman AFB soil background values at Building 922. Likewise, soil samples from all locations and depths had TPH-GRO, TPH-DRO, and TPH-ORO concentrations below the TPH screening level. In addition, no tritium was detected in any of the soil samples. Analytical results for the soil samples are presented in Table 4-1c.

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4.2 Groundwater Analytical Results

4.2.1 Building 920

One monitoring well was installed at Building 920 during the abandoned septic tank investigation, as shown on Figure 3-1a. The July 17, 2012 groundwater sample from well OTC531A-MW01 was field-screened for TDS and had a field-estimated TDS concentration of 24,840 mg/L, well above the NMWQCC limit of 10,000 mg/L as potable water (20.6.2 NMAC). To verify the high TDS concentration a groundwater sample was collected and analyzed by Accutest Laboratories, Inc. for TDS only. The laboratory sample had a TDS concentration of 31,500 mg/L (Table 4-2a), and no additional analyses were performed. For completeness of the RFI, a decision was made to sample and analyze the non-potable, high TDS water and evaluate against the NMWQCC WQS (20.6.2 NMAC) and the EPA drinking water MCLs. A second attempt to sample Building 920 groundwater for the full suite of analyses was made on May 16, 2013, but the well was purged dry after removing only 2,500 milliliters of standing water and showed no recharge after 30 minutes. The ephemeral nature of shallow groundwater at Building 920 was observed at numerous other sites during the Holloman AFB RFIs, and lends uncertainty as to the reliability of the shallow groundwater (upper water table) as a water source. Furthermore, as stated in Section 3.2.4.2 of the *Basewide Septic Tank Solid Waste Management Units, RCRA Facility Investigation Work Plan, Holloman AFB, New Mexico* (USACE, 2010) groundwater may not require testing if it is determined that limited impacts to the soil column have been realized from the septic tanks leach field and as summarized in Section 4.1.1 there were no constituents detected in soil above NMED residential SSLs.

4.2.2 Building 921

One monitoring well was installed at Building 921 during the abandoned septic tank investigation, as shown on Figure 3-1b. The August 14, 2012 groundwater from well OTC531B-MW01 was field-screened for TDS and had a field-estimated TDS concentration of 16,530 mg/L, well above the NMWQCC limit of 10,000 mg/L as potable water (20.6.2 NMAC). To verify the high TDS concentration a groundwater sample was collected and analyzed by Accutest Laboratories, Inc. for TDS only. The laboratory sample had a TDS concentration of 17,100 mg/kg (Table 4-2b), and no additional analyses were performed. For completeness of the RFI, a decision was made to sample and analyze the non-potable, high TDS water and evaluate against the NMWQCC WQS (20.6.2 NMAC) and the EPA drinking water MCLs. The May 15, 2013 well OTC531C-MW01 groundwater likewise had a TDS concentration of 17,100 mg/L, and was analyzed for VOCs, SVOCs, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium by Accutest Laboratories, Inc. Detections were compared to the NMWQCC WQS and EPA drinking water MCLs.

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Groundwater analytical results are shown in Table 4-2b. Manganese (511 µg/L) was detected above the NMWQCC WQS (200 µg/L). The thallium concentration in groundwater was estimated at 2.4 J µg/L, which is considered analytically equivalent to the background level of 2.0 µg/L (and also matches the EPA drinking water MCL value of 2.0 µg/L). No other analytical parameters were detected at concentrations above the NMWQCC WQS, the EPA drinking water MCLs, or the Holloman AFB unfiltered groundwater background values. In addition, tritium was not detected in the Building 921 groundwater.

4.2.3 Building 922

One monitoring well was installed at Building 922 during the abandoned septic tank investigation, as shown on Figure 3-1c. Groundwater from well OTC531C-MW01 was analyzed for VOCs, SVOCs, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium by Accutest Laboratories, Inc. Detections were compared to the NMWQCC WQS and EPA drinking water MCLs. The groundwater at Building 922 had a TDS value less than 10,000 mg/L.

Groundwater analytical results are shown in Table 4-2c. No analytical parameters were detected at concentrations above the NMWQCC WQS or the EPA drinking water MCLs. No tritium was detected in Building 922 groundwater. The groundwater iron concentration exceeded the Holloman AFB unfiltered groundwater background value, but was below the NMWQCC WQS. There is no established EPA drinking water MCL for iron.

4.2.4 Elevated Groundwater Detection Limits

Holloman AFB groundwater samples contain high TDS, typically greater than 10,000 mg/L, and can be as high as 30,000 mg/L. Dissolved solids at these levels can clog the nebulizer that is used to introduce the sample into the plasma during inductively-coupled plasma metals analysis. Sample dilution is the recommended method for solving the nebulizer clogging issue. However, sample dilution raises the analytical MDLs for all associated metals. For example, arsenic typically has a method detection limit of 2 µg/L, which is below the NMWQCC WQS, the EPA drinking water MCL, and the Holloman AFB unfiltered groundwater background value. However, if the laboratory must perform a 1:10 dilution of the sample to prevent nebulizer clogging, the detection limit is now raised to 20 µg/L, which is above both the EPA drinking water MCL and the Holloman AFB unfiltered groundwater background value. Consequently, the required remedy to allow for proper equipment operation results in MDLs that are above one or more water quality criteria. This occurred during both the OT-C531B and OT-C531C groundwater metals analysis.

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4.3 Investigation-Derived Waste Analytical Results

Waste characterization samples were collected from the bulk waste soil for analysis of Toxicity Characteristic Leaching Procedure VOCs, SVOCs, and RCRA metals. The results are presented in Table 4-3. The results of the waste soil analysis returned no concentrations above 40 Code of Federal Regulations Part 261.24 limits. The waste soil could be managed as nonhazardous waste and was subsequently transported to Otero/Greentree Regional Landfill, Alamogordo, New Mexico for disposal (Waste Manifest in Appendix J). The waste water from equipment decontamination was sampled and analyzed for VOCs, SVOCs, TAL metals, TPH-GRO, TPH-DRO, and TPH-ORO, with the analytical results presented in Table 4-4. The analytical results were reviewed by the Holloman AFB waste water treatment plant personnel, and subsequently accepted for disposal.

4.4 Risk-Based Evaluation

4.4.1 Building 920 Soil

Eleven soil samples were collected at Building 920, from depths of 0 to 16 ft bgs, during the abandoned septic tank investigation. Per NMED (2012a), the soil depths of interest are 0 to 10 ft bgs for construction workers and residential receptors, and 0 to 1 ft bgs for commercial/industrial workers. Therefore, results from the initial screening assessment (Table 4-1a) that present data for 0 to 10 ft bgs were used for the risk evaluation. Based on the results of the screening evaluation, no constituents of potential concern (COPC) have a maximum detected concentration greater than NMED residential SSLs (or EPA residential RSLs, if NMED SSLs have not been established) or the Holloman AFB soil background values. Total cancer risk ratios and total hazard ratios (hazard index [HI]) to address potential additive toxicological effects were also assessed (per NMED 2012a, Section 5.0). This was conducted by using maximum detected concentrations of carcinogens and non-carcinogens, estimating risk and hazard ratios, and scaling a total cancer risk and total HI. The total cancer risk was less than 1.0×10^{-5} (total cancer risk: 3.9×10^{-6}) and the total HI was less than 1.0 (site HI: 0.36), as shown in Appendix K.

Therefore, as no COPCs in soil were selected, the future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not health risks.

4.4.2 Building 921 Soil

Eleven soil samples were collected at Building 921, from depths of 0 to 16 ft bgs, during the abandoned septic tank investigation. Per NMED (2012a), the soil depths of interest are 0 to 10 ft bgs for construction workers and residential receptors, and 0 to 1 ft bgs for commercial/industrial workers. Therefore, results from the initial screening assessment (Table 4-1b) that present data for 0 to 10 ft bgs were used for the risk evaluation. Based on

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the results of the screening evaluation, no COPCs have a maximum detected concentration greater than NMED residential SSLs (or EPA residential RSLs, if NMED SSLs have not been established). Total cancer risk ratios and total hazard ratios to address potential additive toxicological effects were also assessed (per NMED 2012a, Section 5.0). This was conducted by using maximum detected concentrations of carcinogens and non-carcinogens, estimating risk and hazard ratios, and scaling a total cancer risk and total HI. The total cancer risk was less than 1.0×10^{-5} (total cancer risk: 9.2×10^{-6}) and the total HI was just slight above 1.0 (site HI: 1.1), as shown in Appendix K. However, the chemicals contributing the most to the HI were iron (hazard quotient [HQ] = 0.28), cobalt (HQ = 0.24), aluminum (HQ = 0.23), manganese (HQ = 0.20), and vanadium (HQ = 0.064). These five chemicals should only be considered for hazard additivity if they all affect the same target organ or system. However, the target organs or systems on which the toxicity reference dose (RfD) is based for these chemicals are as follows:

- Iron RfD based on gastrointestinal tract health endpoint (EPA provisional value)
- Cobalt RfD based on thyroid neurological health endpoint(EPA provisional value)
- Aluminum RfD based on neurological health endpoint (EPA provisional value)
- Manganese RfD based on neurological health endpoint (EPA IRIS data base)
- Vanadium RfD based on adverse impacts to hair follicles (EPA RSL Users Guide).

As only aluminum and manganese adversely affect the same target system (neurological), the additive HI based on similar health endpoints is actually 0.43 (i.e., the sum of the aluminum HQ of 0.23 plus the manganese HQ of 0.20). As 0.43 is less than the target HI of 1.0, hazards are considered to be acceptable.

Metals concentrations exceeded Holloman AFB soil background values, as follows:

- Aluminum exceeded background in samples OTC531B-IS-0006-071112, OTC531B-IS-0008-071112, and OTC531B-IS-0010-071112.
- Copper exceeded background in samples OTC531B-IS-0006-071112 and OTC531B-IS-0010-071112.
- Manganese exceeded background in sample OTC531B-IS-0010-071112.
- Mercury exceeded background in samples OTC531B-IS-0007-071112 and OTC531B-IS-0008-071112.
- Potassium exceeded background in samples OTC531B-IS-0006-071112 and OTC531B-IS-0010-071112.

None of the metals that exceeded Holloman AFB background were present at concentrations above the NMED residential SSLs.

Therefore, as no COPCs in soil were selected, the future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not health risks.

4.4.3 Building 922 Soil

Eleven soil samples were collected at Building 922, from depths of 0 to 16 ft bgs, during the abandoned septic tank investigation. Per NMED (2012a), the soil depths of interest are 0 to 10 ft bgs for construction workers and residential receptors, and 0 to 1 ft bgs for commercial/industrial workers. Therefore, results from the initial screening assessment (Table 4-1c) that present data for 0 to 10 ft bgs were used for the risk evaluation. Based on the results of the screening evaluation, no COPCs have a maximum detected concentration greater than NMED residential SSLs (or EPA residential RSLs, if NMED SSLs have not been established) or the Holloman AFB soil background values. Total cancer risk ratios and total hazard ratios to address potential additive toxicological effects were also assessed (per NMED 2012a, Section 5.0). This was conducted by using maximum detected concentrations of carcinogens and non-carcinogens, estimating risk and hazard ratios, and scaling a total cancer risk and total HI. The total cancer risk was less than 1.0×10^{-5} (total cancer risk: 6.4×10^{-6}) and the total HI was less than 1.0 (site HI: 0.63), as shown in Appendix K.

Therefore, as no COPCs in soil were selected, the future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not health risks.

4.4.4 Building 920 Groundwater

One groundwater sample was collected from the Building 920 monitoring well OTC531A-MW01 on August 14, 2012. TDS analytical results were 31,500 mg/L. TDS concentrations greater than 10,000 mg/L exceed the NMWQCC limit as potable water and thus, the groundwater beneath Building 920 (OT-C531A) Holloman AFB is designated as unfit for human consumption. Likewise, the EPA guidelines have identified the groundwater as a Class IIIB water source, characterized by TDS concentrations exceeding 10,000 mg/L and also characterized by a low degree of interconnection with adjacent surface water or groundwater of a higher class. Groundwater does not discharge or connect to any adjacent aquifers because the Tularosa Basin is a closed basin. Adjacent surface waters include Lost River and Lake Holloman, which also have high concentrations of TDS, and are not considered potential drinking water sources.

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4.4.5 Building 921 Groundwater

One groundwater sample was collected from the Building 921 monitoring well OTC531A-MW01 on August 14, 2012. TDS analytical results were 17,100 mg/L. A second groundwater sample was collected from Building 921 (OT-C531B) on May 15, 2013. Based on the results of the screening evaluation (Table 4-2b), two chemicals have concentrations greater than the: (1) NMWQCC WQS, (2) EPA drinking water MCLs, and (3) site-specific background values (unfiltered). These two COPCs in groundwater are as follows:

- Manganese
- Thallium.

Per the *RFI Work Plan* (USACE, 2010), for groundwater COPCs, an exposure model is required, including the following:

- Media of concern
- Current and future receptors
- Complete and incomplete exposure pathways.

The media of concern is groundwater, and future receptors could include commercial/industrial workers, construction workers, and residents. As current shallow groundwater is not used as a drinking water supply, direct exposure pathways for current receptors are all incomplete, except for potential vapor intrusion concerns for existing occupied buildings located above a VOC groundwater plume. Complete exposure pathways for future receptors include ingestion of COPCs in groundwater, dermal contact with COPCs in groundwater, and inhalation of volatile chemicals in groundwater (not a concern for this site as neither of the groundwater COPCs are a VOC). As shallow groundwater is not currently used as a water supply, the only current receptor would be commercial/industrial workers exposed to COPCs in groundwater via vapor intrusion. Although construction workers might be exposed to COPCs in groundwater during intrusive work at the site, given that the depth to groundwater is approximately 13 to 14 ft, exposure to the COPCs in groundwater at Building 921 is considered an incomplete exposure pathway for construction workers.

Per the *RFI Work Plan* (USACE, 2010), site-specific screening levels may be developed for all complete or potentially complete routes of exposure identified in the exposure model. However, NMED (2012a) only presents groundwater direct exposure equations for tap water for residential exposure, and not for either commercial/industrial workers or construction workers. Therefore, site-specific groundwater direct exposure screening levels are only developed for future residents, for the identified COPCs (manganese and thallium). EPA's

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on-line RSL tool was used to estimate these site-specific groundwater screening levels, relying on NMED-recommended default exposure parameters and toxicity values, when available.

Site-specific screening levels for manganese and thallium are listed as follows, with output from EPA's on-line calculator tool presented in Appendix K:

- Screening Level for manganese in tap water use: 322 µg/L
- Screening Level for thallium in tap water use: 0.155 µg/L.

Per the *RFI Work Plan* (USACE, 2010), more representative site-specific exposure point concentrations (EPCs) should be compared with the site-specific screening levels previously determined. These EPCs are based on 95 percent upper confidence level (UCL) of the mean, estimated using EPA's ProUCL statistical software, version 4.1.01 (EPA, 2010). The 95 percent UCLs for manganese and thallium, however, could not be determined because only one groundwater sample is available. Therefore, the groundwater sample results from this one sample are used as the EPCs. These EPCs exceed the tap water screening level for manganese (511 µg/L exceeds 322 µg/L) and thallium (2.4 µg/L exceeds 0.155 µg/L).

The majority (over 70 percent) of the Environmental Restoration Program sites located across Holloman AFB have groundwater monitoring wells containing water with an average TDS concentration greater than 10,000 mg/L, including Building 921 (OT-C531B) with a TDS concentration of 17,100 mg/L. TDS concentrations greater than 10,000 mg/L exceed the NMWQCC limit as potable water and thus, the groundwater beneath Building 921 at Holloman AFB is designated as unfit for human consumption. Likewise, the EPA guidelines have identified the groundwater as a Class IIIB water source, characterized by TDS concentrations exceeding 10,000 mg/L and also characterized by a low degree of interconnection with adjacent surface water or groundwater of a higher class. Groundwater does not discharge or connect to any adjacent aquifers because the Tularosa Basin is a closed basin. Adjacent surface waters include Lost River and Lake Holloman, which also have high concentrations of TDS, and are not considered potential drinking water sources.

Although future tap water exposure may be considered a potential health concern for manganese and thallium, the aquifer under Building 921 is not suitable for human consumption, and manganese and thallium in groundwater are not a concern.

4.4.6 Building 922 Groundwater

One groundwater sample was collected from the Building 922 monitoring well OTC531C-MW01 on August 14, 2012. Based on the results of the screening evaluation (Table 4-2c), no chemicals were detected at concentrations greater than NMWQCC WQS or EPA drinking

water MCLs. The iron concentration in OTC531C-MW01 groundwater exceeded the site-specific background value (unfiltered), but was below the NMWQCC WQS. Therefore, as no chemicals in groundwater were selected as COPCs, the future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not health risks.

4.4.7 Risk-Based Conclusions

4.4.7.1 Soil

No COPCs were selected for soil at Building 920, Building 921, or Building 922; therefore, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not health risks. In addition, total cancer risks and non-cancer hazards in soil were acceptable.

4.4.7.2 Groundwater

Building 920: Groundwater at Building 920 had a TDS concentration greater than 10,000 mg/L, and is therefore considered unfit for human consumption. In addition, the investigation of groundwater at this site was not necessarily required as no COPCs were selected for soils sampled from the horizons immediately above the expected depth of the shallow water table.

Building 921: Future tap water exposure may be considered a potential health concern for manganese and thallium, but the aquifer under Building 921 has a TDS concentration greater than 10,000 mg/L and is therefore not suitable for human consumption. Consequently manganese and thallium in groundwater are not a concern. In addition, the investigation of groundwater at this site was not necessarily required as no COPCs were selected for soils sampled from the horizons immediately above the expected depth of the shallow water table.

Building 922: No chemicals were detected at concentrations greater than NMWQCC WQS or EPA drinking water MCLs.

In summary for groundwater at Buildings 920, 921, and 922, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure are not health risks.

4.5 Ecological Evaluation

A screening-level ecological risk assessment (SLERA) Scoping Assessment Site Assessment Checklist was completed for the Buildings 920, 921, and 922 (OT-C531A, OT-C531B, and OT-C531C, respectively) septic tank systems and is included in Appendix L. Results of the checklist Exclusion Criteria Decision Tree indicate that the three locations have potential

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viable ecological habitat and a potential exposure pathway exists for soil. Therefore, the SLERA was conducted for the septic systems at the three buildings.

4.5.1 Building 920

The septic tank system at Building 920 was located beyond the fenced portion of the gravel-based surface of the building's yard. The site of the former septic tank system at Building 920 is a flat-lying, sandy surface that is sparsely to moderately well vegetated, as shown in the photographic log in Appendix B. A void area occupies a portion of the former septic system leach field (Figure 3-1a). The surface manifestation of the void is observable as a large open hole, as is also shown in the photographic record.

Soil data results from 0 to 10 ft bgs were included in the comparison and are provided on Table A of Appendix L. According to NMED (2012c), this is the potential depth of interest for wildlife, including burrowing animals. As shown on Table A (Appendix L), six soil samples were available within the 0 to 10 ft bgs zone. Detected constituents in soil included 16 metals and three SVOCs. All other constituents were non-detect for this location.

Metals concentrations were compared to Holloman AFB soil background values as shown in Table A (Appendix L). Detected concentrations of all metals did not exceed Holloman AFB soil background values in the soil samples evaluated. Therefore, no further evaluation was performed for metals.

Detected concentrations of the three SVOCs 2-methylnaphthalene, caprolactam, and naphthalene in soil data collected at the site were compared to the lowest available ecological screening level (ESL) presented in the Los Alamos National Laboratory (LANL) Eco Risk Database version 3.1 (LANL, 2012). The LANL database provides both No-Effect ESLs and Low-Effect ESLs for soil, and both values are provided in Table A of Appendix L. Each of these organics was detected in only one soil sample, and concentrations of 2-methylnaphthalene and naphthalene were below their respective LANL ESLs, indicating that ecological impacts are not likely to occur from the presence of these constituents.

Caprolactam does not have an ESL available in LANL (2012). Therefore, a comparison could not be made for this organic constituent. Thus, the potential for ecological impacts from caprolactam is uncertain.

Since the detected site concentrations are either below their respective Holloman AFB background screening values (as applicable) or below their respective LANL ESLs, it is concluded that risks to the ecological system at and surrounding the Building 920 location are generally acceptable. Since there are no ESLs available to compare with site concentrations of caprolactam (used in the manufacture of synthetic fibers), there is

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uncertainty regarding the potential ecological effects of this organic constituent. Current methodology does not provide a protocol for assessing the level of uncertainly, but the uncertainty is expected to be limited, given that caprolactam was only detected in one of six site samples.

4.5.2 Building 921

The septic tank system at Building 921 was positioned outside the fenced portion of the gravel-based surface of the building's yard. The site of the former septic tank system at Building 921 is a flat-lying, sandy to clayey surface that is well vegetated, as shown in the photographic log in Appendix B. At this location a void area occupies a large portion of the former septic system leach field (Figure 3-1b). The surface expression of the void is concealed by thick vegetation, as shown in the photographic log.

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As was the case for Building 920, soil data results from 0 to 10 ft bgs i.e., the potential depth of interest for wildlife) were included in the comparison and are provided on Table B (Appendix L). As shown on Table B of Appendix L, six soil samples were available within the 0 to 10 ft bgs zone. Detected constituents in soil included 18 metals and two VOCs. All other constituents included in the analysis were non-detected.

Metals concentrations were compared to Holloman AFB soil background values, as shown in Table B (Appendix L). Detected concentrations of most of the metals did not exceed the Holloman AFB soil background screening values. The exceptions were for concentrations of aluminum, copper, manganese, mercury, and potassium which did exceed respective Holloman AFB background soil screening values (Table B, Appendix L) in one to three samples each. Therefore, the five metals (aluminum, copper, manganese, mercury, and potassium) were further evaluated.

Aluminum. Aluminum was detected in all six of the soil samples collected from the former Building 921 septic system, with concentrations ranging from 2,070 mg/kg to 18,000 mg/kg. The Holloman AFB background value for aluminum is 13,722 mg/kg. A total of three detected concentrations exceed the background value. The LANL Eco Risk Database version 3.1 (LANL, 2012) does not provide ESLs for aluminum because its bioavailability is highly dependent on the pH level of soil. Rather, the database notes the following for aluminum: "pH dependent. Aluminum is identified as a COPC only at sites where the soil pH is less than 5.5."

Soil pH data are not available for the soil samples collected from the former Building 921 septic system. However, the 126 background soil samples in the Holloman AFB background data set have calcium concentrations that average 170,000 mg/kg, with a maximum concentration of 410,000 mg/kg. The average value corresponds to 17 weight percent

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calcium, or 24 weight percent as calcium oxide, which is a more accurate way to express it because calcium is not stable in the elemental form. Calcium is present in several different minerals in arid soil, including clay minerals, calcium carbonate, and calcium sulfate. Caliche (which is commonly present at Holloman AFB) is primarily composed of calcium carbonate and calcium sulfate, so it is reasonable to assume that a large fraction of the total calcium present is in the form of calcium carbonate (i.e., $CaCO^3$ or calcite). This mineral is a strong pH buffer and will prevent the soil pH from dropping below approximately 8.0. This is a very common situation in arid regions, especially in closed basins where mineral salts accumulate in soil.

Data available from the Holloman AFB background data set provide strong evidence that soils are likely alkaline and the pH level is not expected to be at a pH of 5.5 or below. Therefore, it is reasonable to conclude that adverse effects to ecological receptors from aluminum are unlikely to occur at the site.

Copper. Copper was detected in all six soil samples collected from the former Building 921 septic system, with concentrations ranging from 2.2 mg/kg to 13.6 mg/kg. The Holloman AFB background screening value for copper is 13 mg/kg. The two highest detected concentrations of copper (13.1 mg/kg and 13.6 mg/kg) exceed the background value. However, these concentrations are below the lowest available ESL for copper as presented in the LANL Eco Risk Database version 3.1 (LANL, 2012) (Table B, Appendix L). Therefore, no adverse ecological effects are predicted for copper.

Manganese. Manganese was detected in all six of the soil samples collected from the former Building 921 septic system, with concentrations ranging from 34.7 mg/kg to 400 mg/kg. The detected concentrations of manganese in soil data were compared to the lowest available ESLs (Table B, Appendix L). One of the six detected concentrations of manganese (400 mg/kg) exceeds its Holloman AFB background screening level of 393 mg/kg. This concentration exceeds only the lowest No-Effect ESL (220 mg/kg), but does not exceed any Low-Effect ESLs as shown in the chart below. The endpoint of concern (i.e., receptor) based on the ESLs of 220 mg/kg and 1,100 mg/kg is terrestrial plants. The manganese ESLs from LANL (2012) are as follows:

Receptor	No-Effect ESL	Low-Effect ESL	Units
American kestrel (Avian intermediate carnivore)	35000	350000	mg/kg
American kestrel (Avian top carnivore)	90000	900000	mg/kg
American robin (Avian herbivore)	1400	14000	mg/kg
American robin (Avian insectivore)	3100	31000	mg/kg
American robin (Avian omnivore)	1900	19000	mg/kg

Receptor	No-Effect ESL	Low-Effect ESL	Units
Deer mouse (Mammalian omnivore)	1400	14000	mg/kg
Desert cottontail (Mammalian herbivore)	2000	20000	mg/kg
Earthworm (Soil-dwelling invertebrate)	450	4500	mg/kg
Generic plant (Terrestrial autotroph - producer)	220	1100	mg/kg
Montane shrew (Mammalian insectivore)	1500	15000	mg/kg
Red fox (Mammalian top carnivore)	41000	410000	mg/kg

Since the maximum detected concentration for manganese exceeds the lowest No-Effect ESL of 220 mg/kg and the Holloman AFB background screening level of 393 mg/kg, an exposure point concentration (EPC) for manganese was calculated to compare to the lowest No-Effect ESL.

Mercury. Mercury was detected in two of six soil samples collected from the former Building 921 septic system, with concentrations ranging from 0.01 mg/kg to 0.014 mg/kg. The maximum detected concentration of mercury exceeds the respective Holloman AFB soil screening value of 0.0108 mg/kg. The detected concentrations of mercury in soil at the Building 921 location were compared to the lowest available ESLs presented in the LANL Eco Risk Database version 3.1 (LANL, 2012). The LANL database provides both No-Effect ESLs and Low-Effect ESLs for soil, as provided in Table B (Appendix L). The maximum detected concentration of mercury (0.014 mg/kg) slightly exceeds the lowest No-Effect ESL (0.013 mg/kg), but is below all Low-Effect ESLs as shown in the chart below. The endpoint of concern (i.e., receptor) for the ESLs of 0.0.013 mg/kg and 0.13 mg/kg is potential food chain impacts for an avian insectivore. The mercury ESLs (from LANL, 2012) are as follows:

Receptor	No-Effect ESL	Low-Effect ESL	Units
American kestrel (Avian intermediate carnivore)	0.082	0.82	mg/kg
American kestrel (Avian top carnivore)	0.28	2.8	mg/kg
American robin (Avian herbivore)	0.07	0.7	mg/kg
American robin (Avian insectivore)	0.013	0.13	mg/kg
American robin (Avian omnivore)	0.022	0.22	mg/kg
Deer mouse (Mammalian omnivore)	3	30	mg/kg
Desert cottontail (Mammalian herbivore)	22	220	mg/kg
Earthworm (Soil-dwelling invertebrate)	0.05	0.5	mg/kg
Generic plant (Terrestrial autotroph - producer)	34	64	mg/kg
Montane shrew (Mammalian insectivore)	1.7	17	mg/kg
Red fox (Mammalian top carnivore)	46	460	mg/kg

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Since the maximum detected concentration for mercury exceeds the lowest No-Effect ESL (0.013 mg/kg) and the Holloman AFB background screening level, an EPC for mercury was calculated to compare with the lowest No-Effect ESL.

Potassium. Potassium was detected in all six of the soil samples collected from around the Building 921 septic system, with concentrations ranging from 684 mg/kg to 5,550 mg/kg. The Holloman AFB background screening level for potassium is 5,077 mg/kg, and the two highest detected concentrations exceeded the background value. The LANL Eco Risk Database version 3.1 (LANL, 2012) does not provide ESLs for potassium because it is an essential nutrient necessary for most organisms (plants and animals) to maintain normal growth and development. Based on potassium's status as an essential nutrient, no further evaluation is warranted.

Organics. Detected concentrations of two VOCs (methyl isobutyl ketone and methylcyclohexane) in soil data collected at the site were compared to the lowest available ESL presented in the LANL Eco Risk Database version 3.1 (LANL, 2012). The LANL No-Effect and Low-Effect ESLs for soil are provided in Table B (Appendix L). These two VOCs were detected in only one soil sample. The concentration of methyl isobutyl ketone was below its respective LANL ESL, indicating that ecological impacts are not likely to occur for this constituent.

Methylcyclohexane does not have an ESL available in LANL (2012). Therefore, no comparison could be made for this organic constituent and the potential for ecological impacts is uncertain.

Estimation of EPCs. Per the *RFI Work Plan* (USACE, 2010), more representative site-specific EPCs should be compared with screening values. EPCs are based on the 95 percent UCL of the mean, if possible, estimated using EPA's ProUCL statistical software, version 4.1.01 (EPA, 2010 and EPA, 2011).

Using ProUCL, the 95 percent UCLs for manganese and mercury are as follows:

- Manganese: 349 mg/kg
- Mercury: 0.0124 mg/kg.

The Pro UCL output is provided in Appendix L.

The EPC for manganese (349 mg/kg) exceeds the lowest No-Effect ESL (220 mg/kg) for plants. However, the manganese EPC is less than all other No-Effect ESLs provided by LANL (2012). Since the Low-Effect ESL is exceeded by the EPC for plants only, it is reasonable to conclude that potential ecological impacts at the site would be limited to plants

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growing near the maximum location, but impacts to plant populations at the site are unlikely. No other ecological impacts are likely to occur from manganese concentrations in soil.

The EPC for mercury (0.0124 mg/kg) is less than all No-Effect and Low-Effect ESLs provided by LANL (2012). Therefore, no ecological impacts are likely to occur from mercury concentrations in soil.

Building 921 Summary. Detected constituents in soil from around the Building 921 former septic system included 18 metals and two VOCs. The majority of the detected metals (except for aluminum, copper, manganese, mercury, and potassium) was below their respective Holloman AFB background screening levels and required no further evaluation. Aluminum present in soil is unlikely to pose adverse effects on ecological receptors because alkaline soil conditions (i.e., pH greater than 7) at Holloman AFB render it unlikely for aluminum to be bioavailable for adverse impacts to ecological receptors such as plants. Potassium is an essential nutrient and is not expected to pose adverse ecological effects. Copper, manganese, and mercury were evaluated and were considered unlikely to pose adverse hazards to populations of receptors at the Building 921 location.

The VOCs methyl isobutyl ketone and methylcyclohexane were also further evaluated and the single detection of methyl isobutyl ketone is below its respective LANL ESL, indicating that ecological impacts are not likely to occur for this constituent. Methylcyclohexane does not have a LANL ESL. Since there is no ESL available to compare with site concentrations of methylcyclohexane, there is uncertainty regarding the potential ecological effects of this organic constituent. Current methodology does not provide a protocol for assessing the level of uncertainly, but the uncertainty is likely limited, given that methylcyclohexane is only detected in 1 of 6 site samples. Based on these findings, it is concluded that risks to the ecological system at and surrounding the Building 921 septic system site are acceptable.

4.5.3 Building 922

As is the case for Buildings 920 and 921, the septic tank system for Building 921 was located outside the fenced portion of the building's yard. The site of the former septic tank system at Building 922 is likewise a flat-lying, sandy surface that is well vegetated, as shown in the photographic log in Appendix B. A void area occupies very small portion of the former leach field as depicted in Figure 3-1c, but has no apparent surface expression.

Soil data results from 0 to 10 ft bgs were included in the comparison and are provided in Table C of Appendix L. According to NMED (2012c), this is the potential depth of interest for wildlife, including burrowing animals. As shown on Table C (Appendix L), six soil samples were collected within the 0 to 10 ft bgs zone. The detected constituents in soil included 16 metals and one VOC. All other constituents in the analyses were non-detected.

Metals concentrations were compared to Holloman AFB soil background values, as shown in Table C (Appendix L). The detected concentrations of metals did not exceed the Holloman AFB soil background values for any of the soil samples. Therefore, no further evaluation was performed for metals.

Detected concentrations of acetone in the soil at the Building 922 location were compared to the lowest available ESL presented in the LANL Eco Risk Database version 3.1 (LANL, 2012). The LANL No-Effect and Low-Effect ESLs for soil are provided in Table C of Appendix L. Acetone was detected in one of the six soil samples, and this concentration is below its respective LANL ESL, indicating that ecological impacts are not likely to occur for this constituent.

Since the detected concentrations are either below their respective Holloman AFB soil background values or below their respective LANL ESLs, it is concluded that risks to the ecological system at and surrounding the site are generally acceptable.

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5.0 DATA QUALITY ASSURANCE AND DATA QUALITY CONTROL REVIEW

All analytical data was reviewed in accordance with EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA, 2004a) and the EPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (EPA, 2004b). Data qualifiers were added to the database prior to project use. The data tables provided in Section 4.0 show the data qualifiers added during data validation. Detailed data validation checklists for each data deliverable are provided in Appendix I.

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6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary and Conclusions

6.1.1 Soil

Eleven soil samples were collected at each former septic tank site at Holloman AFB Buildings 920, 921, and 922. The samples were analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium. Validated analytical results were compared with the NMED residential SSLs, the NMED Residential Direct Exposure Limit for soil contaminated with unknown petroleum oil, and the Holloman AFB soil background values. No constituent concentrations exceeded the NMED residential SSLs. Likewise, TPH was not detected above 1,000 mg/kg in any of the soil samples from any depth or location.

Risk-based health screening that there were no COPCs identified for soil. Total cancer risks and non-cancer hazards in soil were acceptable. The ecological evaluation concluded that risks to the ecological system at and surrounding the site (all three building systems) are generally acceptable.

6.1.2 Groundwater

Groundwater samples were collected when possible as described below, although the results of soil sampling indicated that no COPCs were identified, and therefore precluding the requirement for further groundwater characterization.

Building 920: One groundwater sample collected from Building 920 monitoring well OTC531A-MW01 had a TDS concentration significantly greater than 10,000 mg/L, and is therefore considered unfit for human consumption. An attempt to resample the well was unsuccessful as the well purged dry and did not recharge within a 30 minute period.

Building 921: Both groundwater samples collected from Building 921 monitoring well OTC531B-MW01 had TDS concentrations significantly greater than 10,000mg/L. One of the samples was analyzed for VOCs, SVOCs, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium. Future tap water exposure may be considered a potential health concern for manganese and thallium, but the aquifer under Building 921 (OT-C531B) is not suitable for human consumption, and manganese and thallium in groundwater are not a concern.

Building 922: One groundwater sample was collected from Building 922 monitoring well OTC531C-MW01. The sample was analyzed for VOCs, SVOCs, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium. No parameters were detected at concentrations that exceeded the NMWQCC WQS or the EPA drinking water MCLs.

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6.2 Recommendations

6.2.1 Soil

No COPCs were detected in soil above the NMED residential SSLs. Total cancer risks and non-cancer hazards were acceptable for soil. No unacceptable ecological risk was identified for the site and its surroundings. Therefore, no additional corrective action is recommended for soil at Buildings 920, 921, and 922.

6.2.2 Groundwater

The risk-based evaluation was performed since groundwater samples were collected, although not necessarily required based on the soil sampling results yielding no COPCs for soil. The concluded that future tap water exposure is a potential health concern for the two COPCs identified for groundwater (manganese and thallium).

The risk identified for manganese and thallium in groundwater is based on an unlikely scenario, i.e., future tap water exposure. Holloman AFB obtains its water supply from the city of Alamogordo, New Mexico and from the Holloman AFB wells located in the Boles, San Andres, and Douglas well fields at the base of the Sacramento Mountains.

The current water-use scenario is likely to remain as such, since no shallow water table supply wells are located at the base because of poor groundwater quality (i.e., TDS concentrations often greater than 10,000 mg/L). The shallow water table level at these sites varied from 12 to 16 ft bgs and is not a consistent producer of water.

It is expected that if the shallow groundwater table becomes a consideration for a water supply of any sort, it will require treatment to reduce TDS and/or salinity levels. In that case, the treatment system could be augmented, if necessary, to handle the marginal levels of manganese and thallium present in the shallow water table. Based on this information, the overall recommendation for groundwater at Buildings 920, 921, and 922 (sites OT-C531A, OT-C531B, and OT-C531C, respectively) is no corrective action. However, if the current water supply scenario (i.e., off-base supplied water) changes to the use or attempted use of shallow water table groundwater, then this recommendation should be re-evaluated at that time.

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Tables

Table 3-1a
Sample Summary
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C531A-Station 1	669454.4647	1678198.5067	7/10/2012	Investigation Soil	3 - 5	OTC531A-IS-0001-071012	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/10/2012	Investigation Soil	10 - 12	OTC531A-IS-0002-071012	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OT-C531A-Station 2	669421.2823	1678205.4397	7/10/2012	Investigation Soil	7 - 9	OTC531A-IS-0003-071012	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/10/2012	Investigation Soil - Field Duplicate	7 - 9	OTC531A-IS-0004-071012-FD	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0

Table 3-1a
Sample Summary
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C531A-Station 2	669421.2823	1678205.4397	7/10/2012	Investigation Soil	14 - 16	OTC531A-IS-0005-071012	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OT-C531A-Station 3	669412.9478	1678204.6499	7/10/2012	Investigation Soil	3 - 5	OTC531A-IS-0006-071012	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-GRO	SW8015C
							TPH-DRO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/10/2012	Investigation Soil	10 - 12	OTC531A-IS-0007-071012	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-GRO	SW8015C
							TPH-DRO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0

Table 3-1a
Sample Summary
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C531A-Station 4 (OTC531A-MW01)	669365.2056	1678169.3241	7/10/2012	Investigation Soil	3 - 5	OTC531A-IS-0008-071012	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/10/2012	Investigation Soil	10 - 12	OTC531A-IS-0009-071012	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/10/2012	Investigation Soil	0 - 2	OTC531A-IS-0010-071012	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/10/2012	Investigation Soil	11.5 - 13.5	OTC531A-IS-0011-071012	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OT-C531A-Station 4 (OTC531A-MW01)	669365.2056	1678169.3241	7/17/2012	Groundwater	NA	OTC531A-GW-531A1-071712	TDS	SM2540C

Table 3-1a
Sample Summary
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

[a] Coordinates are referenced to the North American Datum, 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] EPA, 1986, Test Methods for Evaluating Soil Waste Physical/Chemical Methods, EPA Publication SW-846, Final Update IV.
Available online at www.epa.gov/osw/hazard/testmethods/sw846.
Percent Solids and Total Dissolved Solids from *Standard Methods for the Examination of Water and Wastewater* , 19th edition, 1995.

DRO = diesel range organics
EPA = Environmental Protection Agency
FD = field duplicate
ft bgs = feet below ground surface
GRO = gasoline range organics
GW = groundwater
IS = investigation soil
MW = monitoring well
NA = not applicable
ORO = oil range range organics
PCB = polychlorinated biphenyl
RFI = RCRA Faciltiy Investigation
RCRA = Resource Conservation and Recovery Act
SVOC = semivolatile organic compound
TAL = targer anallyte list
TDS = total dissolved solids
TPH = total petroleum hydrocarbons
VOC = volatile organic compound

Table 3-1b
Sample Summary
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C531B-Station 1	668910.2205	1678301.2209	7/11/2012	Investigation Soil	3 - 5	OTC531B-IS-0001-071112	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/11/2012	Investigation Soil	10 - 12	OTC531B-IS-0002-071112	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OT-C531B-Station 2	668877.0581	1678315.4278	7/11/2012	Investigation Soil	7 - 9	OTC531B-IS-0003-071112	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
		1678315.4278	7/11/2012	Investigation Soil - Field Duplicate	7 - 9	OTC531B-IS-0004-071112-FD	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0

Table 3-1b
Sample Summary
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C531B-Station 2	668877.0581	1678315.4278	7/11/2012	Investigation Soil	14 - 16	OTC531B-IS-0005-071112	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OT-C531B-Station 3	668867.5739	1678300.7031	7/11/2012	Investigation Soil	3 - 5	OTC531B-IS-0006-071112	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/11/2012	Investigation Soil	10 - 12	OTC531B-IS-0007-071112	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OT-C531B-Station 4 (OTC531B-MW01)	668828.3842	1678273.9538	7/11/2012	Investigation Soil	3 - 5	OTC531B-IS-0008-071112	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0

Table 3-1b
Sample Summary
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C531B-Station 4 (OTC531B-MW01)	668828.3842	1678273.9538	7/11/2012	Investigation Soil	10 - 12	OTC531B-IS-0009-071112	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/11/2012	Investigation Soil	0 - 2	OTC531B-IS-0010-071112	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/11/2012	Investigation Soil	10 - 12	OTC531B-IS-0011-071112	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			8/14/2012	Groundwater	NA	OTC531B-GW-531B1-081412	TDS	SM2540C
OT-C531B-Station 4 (OTC531B-MW01)	668828.3842	1678273.9538	5/15/2013	Groundwater	NA	OTC531B-GW-531B2-051513	TDS	SM2540C
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0

Table 3-1b
Sample Summary
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

[a] Coordinates are referenced to the North American Datum, 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] EPA, 1986, Test Methods for Evaluating Soil Waste Physical/Chemical Methods, EPA Publication SW-846, Final Update IV.
Available online at www.epa.gov/osw/hazard/testmethods/sw846.
Percent Solids and Total Dissolved Solids from *Standard Methods for the Examination of Water and Wastewater* , 19th edition, 1995.

DRO = diesel range organics
EPA = Environmental Protection Agency
FD = field duplicate
ft bgs = feet below ground surface
GRO = gasoline range organics
GW = groundwater
IS = investigation soil
MW = monitoring well
NA = not applicable
ORO = oil range range organics
PCB = polychlorinated biphenyl
RFI = RCRA Faciltiy Investigation
RCRA = Resource Conservation and Recovery Act
SVOC = semivolatile organic compound
TAL = targer anallyte list
TDS = total dissolved solids
TPH = total petroleum hydrocarbons
VOC = volatile organic compound

Table 3-1c
Sample Summary
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft-bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C531C-Station 1	668368.2296	1678403.9881	7/13/2012	Investigation Soil	3 - 5	OTC531C-IS-0001-071312	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/13/2012	Investigation Soil	10 - 12	OTC531C-IS-0002-071312	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OT-C531C-Station 2	668337.4955	1678415.4998	7/13/2012	Investigation Soil	7 - 9	OTC531C-IS-0003-071312	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/13/2012	Investigation Soil - Field Duplicate	7 - 9	OTC531C-IS-0004-071312-FD	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0

Table 3-1c
Sample Summary
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft-bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C531C-Station 2	668337.4955	1678415.4998	7/13/2012	Investigation Soil	14 - 16	OTC531C-IS-0005-071312	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OT-C531C-Station 3	668329.2059	1678406.9323	7/13/2012	Investigation Soil	3 - 5	OTC531C-IS-0006-071312	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/13/2012	Investigation Soil	10 - 12	OTC531C-IS-0007-071312	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OT-C531C-Station 4 (OTC531C-MW01)	668288.4318	1678381.8235	7/13/2012	Investigation Soil	3 - 5	OTC531C-IS-0008-071312	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0

Table 3-1c
Sample Summary
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft-bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C531C-Station 4 (OTC531C-MW01)	668288.4318	1678381.8235	7/13/2012	Investigation Soil	10 - 12	OTC531C-IS-0009-071312	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/13/2012	Investigation Soil	0 - 2	OTC531C-IS-0010-071312	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/13/2012	Investigation Soil	10 - 12	OTC531C-IS-0011-071312	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OT-C531C-Station 4 (OTC531C-MW01)	668288.4318	1678381.8235	8/14/2012	Groundwater	NA	OTC531C-GW-531C1-081412	TDS	SM2540C
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0

Table 3-1c
Sample Summary
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

[a] Coordinates are referenced to the North American Datum, 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] EPA, 1986, Test Methods for Evaluating Soil Waste Physical/Chemical Methods, EPA Publication SW-846, Final Update IV.
Available online at www.epa.gov/osw/hazard/testmethods/sw846.
Percent Solids and Total Dissolved Solids from *Standard Methods for the Examination of Water and Wastewater* , 19th edition, 1995.

DRO = diesel range organics
EPA = Environmental Protection Agency
FD = field duplicate
ft bgs = feet below ground surface
GRO = gasoline range organics
GW = groundwater
IS = investigation soil
MW = monitoring well
NA = not applicable
ORO = oil range range organics
PCB = polychlorinated biphenyl
RFI = RCRA Faciltiy Investigation
RCRA = Resource Conservation and Recovery Act
SVOC = semivolatile organic compound
TAL = targer anallyte list
TDS = total dissolved solids
TPH = total petroleum hydrocarbons
VOC = volatile organic compound

Table 3-2
Monitoring Well Construction Details and Groundwater Elevation Data
Buildings 920, 921, 922 (OT-C531A, B, C)
Holloman Air Force Base, New Mexico

Well ID	Building	Monitoring Well Construction Details						Groundwater Elevation Data[b]		
		Location Coordinates		Installation Date	Well Diameter (in)	Well Depth at Construction (ft bgs)	Screened Interval (ft bgs)	Top of PVC Riser Pipe Elevation[c] (ft amsl)	Depth to Water (ft below top of PVC riser pipe)	Potentiometric Surface Elevation[c] (ft amsl)
		Grid Northing[a]	Grid Easting[a]							
OTC531A-MW01	920	669365.2056	1678169.3241	7/10/2012	2	17.8	12.8 - 17.8	4047.38	15.90	4031.48
OTC531B-MW01	921	668828.3842	1678273.9538	7/11/2012	2	19.0	14.0 - 19.0	4045.98	12.84	4033.14
OTC531C-MW01	922	668288.4318	1678381.8235	7/13/2012	2	18.0	13.0 - 18.0	4045.45	12.97	4032.48

[a] Location coordinates are referenced to the North American Datum 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] OTC531A-MW01 groundwater elevation from 7/17/12, OTC531B-MW01 and OTC531C-MW01 from 8/14/12.

[c] Elevations are referenced to the North American Vertical Datum of 1988 (NAVD 88).

ft = feet
ft amsl = feet above mean sea level
ft bgs = feet below ground surface
ID = identification
in = inches
PVC = polyvinyl chloride

Table 3-3
Monitoring Well Purge Water Quality Parameters
Buildings 920, 921, 922 (OT-C531A, B, C)
Holloman Air Force Base, New Mexico

Well ID	Sample Date	Depth to Water (ft below top of PVC riser pipe)	Total Depth (ft below top of PVC riser pipe)	Purge Water Volume	Temperature (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	TDS (g/L)
OTC531A-MW01	7/17/2012	15.90	20.46	2.2 Liters	23.65	6.91	38.28	200	2.62	348.9	24.84
OTC531B-MW01	8/14/2012	12.84	20.48	3 Gallons	20.79	6.93	25.430	-6.0	0.51	-24.8	16.53
OTC531C-MW01	8/14/2012	12.97	20.44	7 Gallons	19.90	6.80	12.770	27.6	4.20	-167.0	8.30
OTC531A-MW01[a]	5/16/2013	15.31	20.46	2.5 Liters	21.01	7.30	38.490	34.1	5.65	25.7	Not measured
OTC531B-MW01	5/15/2013	13.49	20.48	2.6 Liters	19.38	6.90	23.830	5.6	2.23	45.5	Not measured

[a] Well purged dry and did not recharge. Sample was not able to be collected.

°C = degrees Celsius
DO = dissolved oxygen
ft = feet
g/L = grams per liter
ID = identification
mg/L = milligrams per liter
mS/cm = millisiemens per centimeter
mV = millivolts
NTU = Nephelometric Turbidity Unit
ORP = oxidation-reduction potential
PVC = polyvinylchloride
TDS = total dissolved solids

Table 4-1a
Soil Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC531A-IS-0001-071012		OTC531A-IS-0002-071012		OTC531A-IS-0003-071012		OTC531A-IS-0004-071012-FD		OTC531A-IS-0005-071012-		OTC531A-IS-0006-071012		OTC531A-IS-0007-071012		OTC531A-IS-0008-071012		OTC531A-IS-0009-071012		OTC531A-IS-0010-071012		OTC531A-IS-0011-071012	
				Sample Date	7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		11.5 - 13.5	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**87.9**		**78.1**		**86.5**		**85.7**		**71.9**		**85.9**		**84.1**		**86.5**		**81.8**		**85.7**		**78.3**	
VOLATILES (mg/kg)																										
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0013	U	0.0018	U	0.0016	U	0.0013	U	0.0021	U	0.0015	U	0.0012	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0015	U	0.0016	U	0.0017	U	0.0019	U	0.0014	U	0.0019	U	0.0017	U	0.0014	U	0.0023	U	0.0017	U	0.0013	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0022	U	0.0022	U	0.0024	U	0.0027	U	0.002	U	0.0027	U	0.0024	U	0.0019	U	0.0033	U	0.0024	U	0.0019	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0013	U	0.0018	U	0.0016	U	0.0013	U	0.0021	U	0.0015	U	0.0012	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0013	U	0.0018	U	0.0016	U	0.0013	U	0.0021	U	0.0015	U	0.0012	U
1,1-DICHLOROETHENE	NE	240	449		0.0018	U	0.0018	U	0.002	U	0.0022	U	0.0016	U	0.0023	U	0.002	U	0.0016	U	0.0027	U	0.002	U	0.0015	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0015	U	0.0016	U	0.0017	U	0.0019	U	0.0014	U	0.0019	U	0.0017	U	0.0014	U	0.0023	U	0.0017	U	0.0013	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0029	U	0.003	U	0.0033	U	0.0037	U	0.0027	U	0.0037	U	0.0033	U	0.0026	U	0.0045	U	0.0032	U	0.0025	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.0013	U	0.0013	U	0.0014	U	0.0016	U	0.0012	U	0.0016	U	0.0014	U	0.0011	U	0.0019	U	0.0014	U	0.0011	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0013	U	0.0018	U	0.0016	U	0.0013	U	0.0021	U	0.0015	U	0.0012	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.0013	U	0.0013	U	0.0014	U	0.0016	U	0.0012	U	0.0016	U	0.0014	U	0.0011	U	0.0019	U	0.0014	U	0.0011	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0015	U	0.0016	U	0.0017	U	0.0019	U	0.0014	U	0.0019	U	0.0017	U	0.0014	U	0.0023	U	0.0017	U	0.0013	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0015	U	0.0016	U	0.0017	U	0.0019	U	0.0014	U	0.0019	U	0.0017	U	0.0014	U	0.0023	U	0.0017	U	0.0013	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0013	U	0.0018	U	0.0016	U	0.0013	U	0.0021	U	0.0015	U	0.0012	U
2-HEXANONE	NE	210	NE		0.0069	U	0.007	U	0.0077	U	0.0086	U	0.0063	U	0.0087	U	0.0077	U	0.0062	U	0.011	U	0.0075	U	0.0059	U
ACETONE	NE	61000	66600		0.025	U	0.026	U	0.029	U	0.032	U	0.023	U	0.032	U	0.029	U	0.023	U	0.039	U	0.028	U	0.022	U
BENZENE	NE	1.1	15.4		0.0019	U	0.0019	U	0.0021	U	0.0024	U	0.0018	U	0.0024	U	0.0021	U	0.0017	U	0.0029	U	0.0021	U	0.0016	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0013	U	0.0018	U	0.0016	U	0.0013	U	0.0021	U	0.0015	U	0.0012	U
BROMOFORM	NE	62	616		0.0019	U	0.0019	U	0.0021	U	0.0024	U	0.0018	U	0.0024	U	0.0021	U	0.0017	U	0.0029	U	0.0021	U	0.0016	U
BROMOMETHANE	NE	7.3	16.5		0.0025	U	0.0026	U	0.0029	U	0.0032	U	0.0023	U	0.0032	U	0.0029	U	0.0023	U	0.0039	U	0.0028	U	0.0022	U
CARBON DISULFIDE	NE	820	1530		0.0025	U	0.0026	U	0.0029	U	0.0032	U	0.0023	U	0.0032	U	0.0029	U	0.0023	U	0.0039	U	0.0028	U	0.0022	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0023	U	0.0023	U	0.0026	U	0.0029	U	0.0021	U	0.0029	U	0.0026	U	0.0021	U	0.0035	U	0.0025	U	0.002	U
CHLOROBENZENE	NE	290	376		0.0013	U	0.0013	U	0.0014	U	0.0016	U	0.0012	U	0.0016	U	0.0014	U	0.0011	U	0.0019	U	0.0014	U	0.0011	U
CHLOROETHANE	NE	15000	29800		0.0025	U	0.0026	U	0.0029	U	0.0032	U	0.0023	U	0.0032	U	0.0029	U	0.0023	U	0.0039	U	0.0028	U	0.0022	U
CHLOROFORM	NE	0.29	5.86		0.0015	U	0.0016	U	0.0017	U	0.0019	U	0.0014	U	0.0019	U	0.0017	U	0.0014	U	0.0023	U	0.0017	U	0.0013	U
CHLOROMETHANE	NE	120	275		0.0025	U	0.0026	U	0.0029	U	0.0032	U	0.0023	U	0.0032	U	0.0029	U	0.0023	U	0.0039	U	0.0028	U	0.0022	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0019	U	0.0019	U	0.0021	U	0.0024	U	0.0018	U	0.0024	U	0.0021	U	0.0017	U	0.0029	U	0.0021	U	0.0016	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0013	U	0.0013	U	0.0014	U	0.0016	U	0.0012	U	0.0016	U	0.0014	U	0.0011	U	0.0019	U	0.0014	U	0.0011	U
CYCLOHEXANE	NE	7000	NE		0.0018	U	0.0018	U	0.002	U	0.0022	U	0.0016	U	0.0023	U	0.002	U	0.0016	U	0.0027	U	0.002	U	0.0015	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.0013	U	0.0013	U	0.0014	U	0.0016	U	0.0012	U	0.0016	U	0.0014	U	0.0011	U	0.0019	U	0.0014	U	0.0011	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0019	U	0.0019	U	0.0021	U	0.0024	U	0.0018	U	0.0024	U	0.0021	U	0.0017	U	0.0029	U	0.0021	U	0.0016	U
ETHYLBENZENE	NE	5.4	68.4		0.0013	U	0.0013	U	0.0014	U	0.0016	U	0.0012	U	0.0016	U	0.0014	U	0.0011	U	0.0019	U	0.0014	U	0.0011	U
ISOPROPYLBENZENE	NE	2100	2430		0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0013	U	0.0018	U	0.0016	U	0.0013	U	0.0021	U	0.0015	U	0.0012	U
METHYL ACETATE	NE	78000	78200		0.016	U	0.016	U	0.018	U	0.02	U	0.015	U	0.02	U	0.018	U	0.014	U	0.024	U	0.017	U	0.014	U
METHYL ETHYL KETONE	NE	28000	37100		0.0077	U	0.0079	U	0.0087	U	0.0098	U	0.0071	U	0.0098	U	0.0087	U	0.007	U	0.012	U	0.0085	U	0.0067	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.007	U	0.0071	U	0.0079	U	0.0088	U	0.0064	U	0.0088	U	0.0079	U	0.0063	U	0.011	U	0.0077	U	0.006	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0017	U	0.0017	U	0.0019	U	0.0021	U	0.0015	U	0.0021	U	0.0019	U	0.0015	U	0.0025	U	0.0018	U	0.0014	U
METHYLENE CHLORIDE	NE	56	409		0.0058	U	0.0059	U	0.0066	U	0.0074	U	0.0054	U	0.0074	U	0.0066	U	0.0053	U	0.009	U	0.0064	U	0.005	U

Table 4-1a
Soil Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC531A-IS-0001-071012		OTC531A-IS-0002-071012		OTC531A-IS-0003-071012		OTC531A-IS-0004-071012-FD		OTC531A-IS-0005-071012-		OTC531A-IS-0006-071012		OTC531A-IS-0007-071012		OTC531A-IS-0008-071012		OTC531A-IS-0009-071012		OTC531A-IS-0010-071012		OTC531A-IS-0011-071012	
				Sample Date	7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		11.5 - 13.5	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																										
STYRENE	NE	6300	7280		0.0033	U	0.0034	U	0.0037	U	0.0042	U	0.003	U	0.0042	U	0.0037	U	0.003	U	0.0051	U	0.0036	U	0.0028	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0025	U	0.0026	U	0.0029	U	0.0032	U	0.0023	U	0.0032	U	0.0029	U	0.0023	U	0.0039	U	0.0028	U	0.0022	U
TETRACHLOROETHYLENE	NE	22	7.02		0.0013	U	0.0013	U	0.0014	U	0.0016	U	0.0012	U	0.0016	U	0.0014	U	0.0011	U	0.0019	U	0.0014	U	0.0011	U
TOLUENE	NE	5000	5270		0.0015	U	0.0016	U	0.0017	U	0.0019	U	0.0014	U	0.0019	U	0.0017	U	0.0014	U	0.0023	U	0.0017	U	0.0013	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0019	U	0.0019	U	0.0021	U	0.0024	U	0.0018	U	0.0024	U	0.0021	U	0.0017	U	0.0029	U	0.0021	U	0.0016	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0013	U	0.0018	U	0.0016	U	0.0013	U	0.0021	U	0.0015	U	0.0012	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0015	U	0.0016	U	0.0017	U	0.0019	U	0.0014	U	0.0019	U	0.0017	U	0.0014	U	0.0023	U	0.0017	U	0.0013	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0025	U	0.0026	U	0.0029	U	0.0032	U	0.0023	U	0.0032	U	0.0029	U	0.0023	U	0.0039	U	0.0028	U	0.0022	U
VINYL CHLORIDE	NE	0.06	0.728		0.0019	U	0.0019	U	0.0021	U	0.0024	U	0.0018	U	0.0024	U	0.0021	U	0.0017	U	0.0029	U	0.0021	U	0.0016	U
XYLENES, TOTAL	NE	630	814		0.0041	U	0.0041	U	0.0046	U	0.0051	U	0.0037	U	0.0051	U	0.0046	U	0.0037	U	0.0062	U	0.0045	U	0.0035	U
SEMIVOLATILES (mg/kg)																										
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.019	UJ	0.021	UJ	0.019	UJ	0.02	UJ	0.023	UJ	0.02	UJ	0.02	UJ	0.019	UJ	0.02	UJ	0.02	UJ	0.021	UJ
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
2,4-DICHLOROPHENOL	NE	180	183		0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.024	U	0.027	U	0.024	U	0.025	U	0.03	U	0.025	U	0.025	U	0.024	U	0.026	U	0.025	U	0.026	U
2,4-DINITROPHENOL	NE	120	122		0.38	U	0.43	U	0.39	U	0.4	U	0.47	U	0.39	U	0.4	U	0.39	U	0.41	U	0.39	U	0.42	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
2,6-DINITROTOLUENE	NE	61	61.1		0.022	U	0.025	U	0.023	U	0.023	U	0.028	U	0.023	U	0.024	U	0.023	U	0.024	U	0.023	U	0.025	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
2-CHLOROPHENOL	NE	390	391		0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
2-METHYLNAPHTHALENE	NE	230	NE		0.019	U	0.021	U	**0.0814**	J	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
2-METHYLPHENOL	NE	3100	NE		0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
2-NITROANILINE	NE	610	NE		0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
2-NITROPHENOL	NE	NE	NE		0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
3-NITROANILINE	NE	NE	NE		0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.076	U	0.086	U	0.077	U	0.079	U	0.094	U	0.079	U	0.08	U	0.078	U	0.081	U	0.079	U	0.084	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
4-CHLOROANILINE	NE	2.4	NE		0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
4-NITROANILINE	NE	24	NE		0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
4-NITROPHENOL	NE	NE	NE		0.15	U	0.17	U	0.15	U	0.16	U	0.19	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.17	U
ACENAPHTHENE	NE	3400	3440		0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
ACENAPHTHYLENE	NE	NE	NE		0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
ACETOPHENONE	NE	7800	7820		0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
ANTHRACENE	NE	17000	17200		0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
ATRAZINE	NE	2.1	NE		0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U

Table 4-1a
Soil Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC531A-IS-0001-071012		OTC531A-IS-0002-071012		OTC531A-IS-0003-071012		OTC531A-IS-0004-071012-FD		OTC531A-IS-0005-071012-		OTC531A-IS-0006-071012		OTC531A-IS-0007-071012		OTC531A-IS-0008-071012		OTC531A-IS-0009-071012		OTC531A-IS-0010-071012		OTC531A-IS-0011-071012	
				Sample Date	7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		11.5 - 13.5	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																										
BENZALDEHYDE	NE	7800	NE	0.19	U	0.21	U	0.19	U	0.2	U	0.23	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.21	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
BENZO(A)PYRENE	NE	0.015	0.148	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
BIPHENYL	NE	51	57.1	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.076	U	0.086	U	0.077	U	0.079	U	0.094	U	0.079	U	0.08	U	0.078	U	0.081	U	0.079	U	0.084	U
CAPROLACTAM	NE	31000	NE	0.061	U	0.069	U	**0.0687**	J	0.063	U	0.075	U	0.063	U	0.064	U	0.062	U	0.065	U	0.063	U	0.067	U
CARBAZOLE	NE	NE	NE	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
CHRYSENE	NE	15	148	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
DIBENZOFURAN	NE	78	NE	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
DIETHYL PHTHALATE	NE	49000	48900	0.076	U	0.086	U	0.077	U	0.079	U	0.094	U	0.079	U	0.08	U	0.078	U	0.081	U	0.079	U	0.084	U
DIMETHYL PHTHALATE	NE	611000	611000	0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.076	U	0.086	U	0.077	U	0.079	U	0.094	U	0.079	U	0.08	U	0.078	U	0.081	U	0.079	U	0.084	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
FLUORANTHENE	NE	2300	2290	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
FLUORENE	NE	2300	2290	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.084	UJ	0.094	UJ	0.085	UJ	0.087	UJ	0.1	UJ	0.087	UJ	0.088	UJ	0.085	UJ	0.089	UJ	0.086	UJ	0.092	UJ
HEXACHLOROETHANE	NE	12	42.8	0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
ISOPHORONE	NE	510	5120	0.019	UJ	0.021	UJ	0.019	UJ	0.02	UJ	0.023	UJ	0.02	UJ	0.02	UJ	0.019	UJ	0.02	UJ	0.02	UJ	0.021	UJ
M,P-CRESOL	NE	NE	NE	0.027	U	0.031	U	0.028	U	0.028	U	0.034	U	0.028	U	0.029	U	0.028	U	0.029	U	0.028	U	0.03	U
NAPHTHALENE	NE	3.6	43.0	0.03	U	0.034	U	**0.0318**	J	0.032	U	0.038	U	0.032	U	0.032	U	0.031	U	0.032	U	0.031	U	0.034	U
NITROBENZENE	NE	4.8	53.5	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.23	U	0.26	U	0.23	U	0.24	U	0.28	U	0.24	U	0.24	U	0.23	U	0.24	U	0.24	U	0.25	U
PHENANTHRENE	NE	1830	1830	0.019	U	0.021	U	0.0274	J	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
PHENOL	NE	18000	18300	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
PYRENE	NE	1700	1720	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U

Table 4-1a
Soil Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC531A-IS-0001-071012		OTC531A-IS-0002-071012		OTC531A-IS-0003-071012		OTC531A-IS-0004-071012-FD		OTC531A-IS-0005-071012-		OTC531A-IS-0006-071012		OTC531A-IS-0007-071012		OTC531A-IS-0008-071012		OTC531A-IS-0009-071012		OTC531A-IS-0010-071012		OTC531A-IS-0011-071012	
				Sample Date	7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		11.5 - 13.5	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																										
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
1,3-DINITROBENZENE	NE	6.10	NE	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
2,4-DINITROTOLUENE	NE	1.60	15.7	0.085	U	0.085	U	0.091	U	0.094	U	0.083	U	0.093	U	0.096	U	0.09	U	0.083	U	0.095	U	0.092	U
2,6-DINITROTOLUENE	NE	61.0	61.1	0.077	U	0.077	U	0.082	U	0.084	U	0.074	U	0.083	U	0.086	U	0.081	U	0.074	U	0.085	U	0.082	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
2-NITROTOLUENE	NE	2.90	29.1	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
3-NITROTOLUENE	NE	6.10	7.82	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
4-NITROTOLUENE	NE	30.0	244.4	0.089	U	0.089	U	0.095	U	0.098	U	0.086	U	0.097	U	0.1	U	0.094	U	0.086	U	0.099	U	0.095	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
NITROBENZENE	NE	4.80	53.5	0.082	U	0.082	U	0.087	U	0.09	U	0.079	U	0.089	U	0.092	U	0.087	U	0.079	U	0.091	U	0.088	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
TETRYL	NE	240.0	244.0	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
METALS (mg/kg)																										
ALUMINUM	13722	77000	78000	**5260**		**1890**		**2250**		**2880**		**1850**		**1090**		**1860**		**1280**		**1330**		**5740**		**1160**	
ANTIMONY	1.6	31	31.3	0.99	U	0.96	U	0.97	U	1.1	U	1.1	U	1	U	0.92	U	1.1	UJ	1.2	U	1	U	1.1	U
ARSENIC	3.7	0.39	3.90	**1.5**	J	0.96	U	0.97	U	1.1	U	1.1	U	1	U	0.92	U	1.1	U	1.2	U	**1.3**	J	1.1	U
BARIUM	169.3	15000	15600	**66.2**	J	**16.9**	J	**24.6**	J	**33.4**	J	**18.6**	J	**27.8**	J	**20.3**	J	**12.7**	J	**12.1**	J	**37.2**	J	**13.5**	J
BERYLLIUM	1.6	160	156	0.49	U	0.48	U	0.49	U	0.57	U	0.57	U	0.52	U	0.46	U	0.57	U	0.58	U	0.51	U	0.56	U
CADMIUM	0.3	70	70.3	0.49	U	0.48	U	0.49	U	0.57	U	0.57	U	0.52	U	0.46	U	0.57	UJ	0.58	U	0.51	U	0.56	U
CALCIUM	317332	NE	NE	**141000**		**250000**		**219000**		**222000**		**228000**		**209000**		**246000**		**224000**		**176000**		**160000**		**205000**	
CHROMIUM[d]	25	117000	117000	**4.6**	J	**1.7**	J	**1.7**	J	**2.6**	J	**1.7**	J	**0.69**	J	**1.6**	J	**1.7**	J	**1.1**	J	**5.1**		**1**	J
COBALT	7.7	23	NE	**1.7**	J	**0.61**	J	**0.88**	J	**1**	J	0.57	U	0.52	U	**0.61**	J	0.57	U	0.58	U	**2**	J	0.56	U
COPPER	13	3100	3130	**2.8**	J	**1.1**	J	**2.2**	J	**2.6**	J	**1.4**	J	**2.1**	J	**1.5**	J	**1.1**	J	**1.8**	J	**4.7**	J	**1.4**	J
IRON	23049	55000	54800	**4830**		**1770**		**1980**		**2440**		**1750**		**836**		**1620**		**1150**		**1210**		**4590**		**1030**	
LEAD	10.9	400	400	**2.3**	J	**0.48**	J	**1.1**	J	**0.67**	J	0.57	U	0.52	U	0.46	U	0.57	U	0.58	U	**2**	J	0.56	U
MAGNESIUM	16991	NE	NE	**1870**	J	**962**	J	**2150**	J	**2380**	J	**1410**	J	**970**	J	**1090**	J	**971**	J	**920**	J	**6810**		**972**	J
MANGANESE	393	1800	1860	**76**		**25.2**		**36.4**		**46.7**		**22.3**		**15.3**		**27.5**		**19.8**		**17.9**		**121**		**22.5**	
MERCURY	0.0108	10	15.6	0.009	U	0.0098	U	0.009	U	0.0094	U	0.011	U	0.0094	U	0.0094	U	0.0092	U	0.0093	U	0.0088	U	0.01	U
NICKEL	17.4	1500	1560	**3.7**	J	**1.2**	J	**1.7**	J	**2.2**	J	**0.98**	J	**0.8**	J	**1.3**	J	0.01	U	**0.72**	J	**4.1**	J	**0.85**	J
POTASSIUM	5077	NE	NE	**1700**	J	**577**	J	**657**	J	**1270**	J	**605**	J	**534**	J	**631**	J	0.01	U	**486**	J	**1820**	J	**314**	J
SELENIUM	1.4	390	391	2	U	1.9	U	1.9	U	2.3	U	2.3	U	2.1	U	1.8	U	0.01	U	2.3	U	2	U	2.2	U
SILVER	1.1	390	391	0.49	U	0.48	U	0.49	U	0.57	U	0.57	U	0.52	U	0.46	U	0.01	U	0.58	U	0.51	U	0.56	U
SODIUM	5196	NE	NE	**920**	J	530	U	**837**	J	**1290**	J	**2070**	J	**1480**	J	**697**	J	0.01	U	**1020**	J	**3530**	J	**1440**	J
THALLIUM	1.3	0.78	0.782	1.3	U	1.2	U	1.3	U	1.5	U	1.5	U	1.4	U	1.2	U	1.5	U	1.5	U	1.3	U	1.5	U
VANADIUM	42.6	390	391	**12.1**	J	**3.6**	J	**5.6**	J	**6.2**	J	**3.7**	J	**2.3**	J	**3.2**	J	**2.4**	J	**2.5**	J	**9.6**	J	**1.9**	J
ZINC	54.6	23000	23500	**12.3**		**3.8**	J	**8.9**	J	**6.6**	J	**4.1**	J	2.6	U	**3.7**	J	2.9	U	**3.8**	J	**14.2**		2.8	U

Table 4-1a
Soil Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC531A-IS-0001-071012		OTC531A-IS-0002-071012		OTC531A-IS-0003-071012		OTC531A-IS-0004-071012-FD		OTC531A-IS-0005-071012-		OTC531A-IS-0006-071012		OTC531A-IS-0007-071012		OTC531A-IS-0008-071012		OTC531A-IS-0009-071012		OTC531A-IS-0010-071012		OTC531A-IS-0011-071012	
				Sample Date	7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		11.5 - 13.5	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																										
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0075	U	0.0085	U	0.0077	U	0.0077	U	0.0092	U	0.0076	U	0.0078	U	0.0077	U	0.0081	U	0.0078	U	0.0084	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.0093	U	0.011	U	0.0096	U	0.0096	U	0.012	U	0.0095	U	0.0098	U	0.0096	U	0.01	U	0.0097	U	0.011	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.0093	U	0.011	U	0.0096	U	0.0096	U	0.012	U	0.0095	U	0.0098	U	0.0096	U	0.01	U	0.0097	U	0.011	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0075	U	0.0085	U	0.0077	U	0.0077	U	0.0092	U	0.0076	U	0.0078	U	0.0077	U	0.0081	U	0.0078	U	0.0084	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0075	U	0.0085	U	0.0077	U	0.0077	U	0.0092	U	0.0076	U	**0.0526**		0.0077	U	0.0081	U	0.0078	U	0.0084	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0075	U	0.0085	U	0.0077	U	0.0077	U	0.0092	U	0.0076	U	0.0078	U	0.0077	U	0.0081	U	0.0078	U	0.0084	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0075	U	0.0085	U	0.0077	U	0.0077	U	0.0092	U	0.0076	U	0.0078	U	0.0077	U	0.0081	U	0.0078	U	0.0084	U
PETROLEUM HYDROCARBONS (mg/kg)																										
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	4	U	5.5	U	3.9	U	4.3	U	3.7	U	3.7	U	4.3	U	3.9	U	3.6	U	5.1	U	3	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	3.8	U	4.3	U	3.8	U	3.8	U	4.6	U	3.9	U	**4.13**	J	3.9	U	4.1	U	3.8	U	4.2	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000	3.8	U	4.3	U	3.8	U	3.8	U	4.6	U	3.9	U	3.9	U	3.9	U	4.1	U	3.8	U	4.2	U
CYANIDE (mg/kg)																										
CYANIDE	NE	22.0	46.9	0.068	U	0.075	U	0.068	U	0.07	U	0.08	U	0.07	U	0.071	U	0.067	U	0.072	U	0.069	U	0.074	U
TRITIUM (pCi/g)																										
TRITIUM	NE	NE	NE	5.4	U	5.37	U	5.42	U	5.42	U	5.04	U	5.2	U	4.75	U	4.79	U	5.52	U	4.85	U	5.43	U

Table 4-1a
Soil Analytical Data
Buidling 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, February, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
EPA = U.S. Environmental Protection Agency
FD = field duplicate
ft bgs = feet below ground surface
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Table 4-1b
Soil Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC531B-IS-0001-071112		OTC531B-IS-0002-071112		OTC531B-IS-0003-071112		OTC531B-IS-0004-071112-FD		OTC531B-IS-0005-071112		OTC531B-IS-0006-071112		OTC531B-IS-0007-071112		OTC531B-IS-0008-071112		OTC531B-IS-0009-071112		OTC531B-IS-0010-071112		OTC531B-IS-0011-071112	
				Sample Date	7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**77.1**		**71.6**		**82.6**				**75.3**		**85.2**		**72.7**		**87.2**		**74.7**		**88.1**		**72.9**	
VOLATILES (mg/kg)																										
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0013	U	0.0011	U	0.0011	U	0.0011	U	0.001	U	0.0013	U	0.001	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0014	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0014	U	0.0011	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.002	U	0.0017	U	0.0017	U	0.0017	U	0.0016	U	0.002	U	0.0016	U	0.0019	U	0.0016	U	0.0017	U	0.0016	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0013	U	0.0011	U	0.0011	U	0.0011	U	0.001	U	0.0013	U	0.001	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0013	U	0.0011	U	0.0011	U	0.0011	U	0.001	U	0.0013	U	0.001	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
1,1-DICHLOROETHENE	NE	240	449		0.0016	U	0.0014	U	0.0014	U	0.0014	U	0.0013	U	0.0017	U	0.0013	U	0.0015	U	0.0013	U	0.0014	U	0.0014	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0014	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0014	U	0.0011	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0027	U	0.0023	U	0.0023	U	0.0023	U	0.0022	U	0.0027	U	0.0022	U	0.0025	U	0.0021	U	0.0023	U	0.0022	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.0012	U	0.001	U	0.00099	U	0.001	U	0.00094	U	0.0012	U	0.00095	U	0.0011	U	0.00092	U	0.001	U	0.00096	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0013	U	0.0011	U	0.0011	U	0.0011	U	0.001	U	0.0013	U	0.001	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.0012	U	0.001	U	0.00099	U	0.001	U	0.00094	U	0.0012	U	0.00095	U	0.0011	U	0.00092	U	0.001	U	0.00096	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0014	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0014	U	0.0011	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0014	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0014	U	0.0011	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0013	U	0.0011	U	0.0011	U	0.0011	U	0.001	U	0.0013	U	0.001	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
2-HEXANONE	NE	210	NE		0.0063	U	0.0054	U	0.0054	U	0.0055	U	0.0051	U	0.0064	U	0.0051	U	0.0059	U	0.005	U	0.0055	U	0.0052	U
ACETONE	NE	61000	66600		0.023	U	0.02	U	0.02	U	0.02	U	0.019	U	0.024	U	0.019	U	0.022	U	0.018	U	0.02	U	0.019	U
BENZENE	NE	1.1	15.4		0.0018	U	0.0015	U	0.0015	U	0.0015	U	0.0014	U	0.0018	U	0.0014	U	0.0016	U	0.0014	U	0.0015	U	0.0014	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0013	U	0.0011	U	0.0011	U	0.0011	U	0.001	U	0.0013	U	0.001	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
BROMOFORM	NE	62	616		0.0018	U	0.0015	U	0.0015	U	0.0015	U	0.0014	U	0.0018	U	0.0014	U	0.0016	U	0.0014	U	0.0015	U	0.0014	U
BROMOMETHANE	NE	7.3	16.5		0.0023	U	0.002	U	0.002	U	0.002	U	0.0019	U	0.0024	U	0.0019	U	0.0022	U	0.0018	U	0.002	U	0.0019	U
CARBON DISULFIDE	NE	820	1530		0.0023	U	0.002	U	0.002	U	0.002	U	0.0019	U	0.0024	U	0.0019	U	0.0022	U	0.0018	U	0.002	U	0.0019	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0021	U	0.0018	U	0.0018	U	0.0018	U	0.0017	U	0.0021	U	0.0017	U	0.002	U	0.0017	U	0.0018	U	0.0017	U
CHLOROBENZENE	NE	290	376		0.0012	U	0.001	U	0.00099	U	0.001	U	0.00094	U	0.0012	U	0.00095	U	0.0011	U	0.00092	U	0.001	U	0.00096	U
CHLOROETHANE	NE	15000	29800		0.0023	U	0.002	U	0.002	U	0.002	U	0.0019	U	0.0024	U	0.0019	U	0.0022	U	0.0018	U	0.002	U	0.0019	U
CHLOROFORM	NE	0.29	5.86		0.0014	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0014	U	0.0011	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U
CHLOROMETHANE	NE	120	275		0.0023	UJ	0.002	UJ	0.002	UJ	0.002	UJ	0.0019	UJ	0.0024	UJ	0.0019	UJ	0.0022	UJ	0.0018	UJ	0.002	UJ	0.0019	UJ
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0018	U	0.0015	U	0.0015	U	0.0015	U	0.0014	U	0.0018	U	0.0014	U	0.0016	U	0.0014	U	0.0015	U	0.0014	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0012	U	0.001	U	0.00099	U	0.001	U	0.00094	U	0.0012	U	0.00095	U	0.0011	U	0.00092	U	0.001	U	0.00096	U
CYCLOHEXANE	NE	7000	NE		0.0018	UJ	0.0019	UJ	0.0017	UJ	0.0016	UJ	0.0018	UJ	0.0016	UJ	0.0018	UJ	0.0015	UJ	0.0018	UJ	0.0016	UJ	0.0019	UJ
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.0012	U	0.001	U	0.00099	U	0.001	U	0.00094	U	0.0012	U	0.00095	U	0.0011	U	0.00092	U	0.001	U	0.00096	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0018	UJ	0.0015	UJ	0.0015	UJ	0.0015	UJ	0.0014	UJ	0.0018	UJ	0.0014	UJ	0.0016	UJ	0.0014	UJ	0.0015	UJ	0.0014	UJ
ETHYLBENZENE	NE	5.4	68.4		0.0012	U	0.001	U	0.00099	U	0.001	U	0.00094	U	0.0012	U	0.00095	U	0.0011	U	0.00092	U	0.001	U	0.00096	U
ISOPROPYLBENZENE	NE	2100	2430		0.0013	U	0.0011	U	0.0011	U	0.0011	U	0.001	U	0.0013	U	0.001	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
METHYL ACETATE	NE	78000	78200		0.015	U	0.013	U	0.012	U	0.013	U	0.012	U	0.015	U	0.012	U	0.014	U	0.011	U	0.013	U	0.012	U
METHYL ETHYL KETONE	NE	28000	37100		0.0071	U	0.0061	U	0.0061	U	0.0062	U	0.0057	U	0.0072	U	0.0058	U	0.0067	U	0.0056	U	0.0062	U	0.0059	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0064	U	0.0055	U	**0.0058**	J	0.0056	U	0.0052	U	0.0065	U	0.0052	U	0.006	U	**0.0062**	J	0.0056	U	**0.0063**	J
METHYLCYCLOHEXANE	NE	5630	5630		0.0016	UJ	0.0018	UJ	0.0016	UJ	0.0015	UJ	0.0017	UJ	0.0015	UJ	0.0017	UJ	0.0014	UJ	**0.0018**		**0.0017**		0.0013	U
METHYLENE CHLORIDE	NE	56	409		0.0054	U	0.0046	U	0.0046	U	0.0047	U	0.0043	U	0.0055	U	0.0044	U	0.005	U	0.0042	U	0.0047	U	0.0044	U

Table 4-1b
Soil Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC531B-IS-0001-071112		OTC531B-IS-0002-071112		OTC531B-IS-0003-071112		OTC531B-IS-0004-071112-FD		OTC531B-IS-0005-071112		OTC531B-IS-0006-071112		OTC531B-IS-0007-071112		OTC531B-IS-0008-071112		OTC531B-IS-0009-071112		OTC531B-IS-0010-071112		OTC531B-IS-0011-071112	
				Sample Date	7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																										
STYRENE	NE	6300	7280		0.003	U	0.0026	U	0.0026	U	0.0026	U	0.0024	U	0.0031	U	0.0025	U	0.0028	U	0.0024	U	0.0027	U	0.0025	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0023	U	0.002	U	0.002	U	0.002	U	0.0019	U	0.0024	U	0.0019	U	0.0022	U	0.0018	U	0.002	U	0.0019	U
TETRACHLOROETHYLENE	NE	22	7.02		0.0012	U	0.001	U	0.00099	U	0.001	U	0.00094	U	0.0012	U	0.00095	U	0.0011	U	0.00092	U	0.001	U	0.00096	U
TOLUENE	NE	5000	5270		0.0014	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0014	U	0.0011	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0018	U	0.0015	U	0.0015	U	0.0015	U	0.0014	U	0.0018	U	0.0014	U	0.0016	U	0.0014	U	0.0015	U	0.0014	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0013	U	0.0011	U	0.0011	U	0.0011	U	0.001	U	0.0013	U	0.001	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0014	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0014	U	0.0011	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0023	U	0.002	U	0.002	U	0.002	U	0.0019	U	0.0024	U	0.0019	U	0.0022	U	0.0018	U	0.002	U	0.0019	U
VINYL CHLORIDE	NE	0.06	0.728		0.0018	U	0.0015	U	0.0015	U	0.0015	U	0.0014	U	0.0018	U	0.0014	U	0.0016	U	0.0014	U	0.0015	U	0.0014	U
XYLENES, TOTAL	NE	630	814		0.0037	U	0.0032	U	0.0032	U	0.0032	U	0.003	U	0.0038	U	0.003	U	0.0035	U	0.0029	U	0.0033	U	0.0031	U
SEMIVOLATILES (mg/kg)																										
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.21	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.22	U	0.019	U	0.023	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
2,4-DICHLOROPHENOL	NE	180	183		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.027	U	0.03	U	0.025	U	0.025	U	0.028	U	0.024	U	0.029	U	0.024	U	0.028	U	0.024	U	0.028	U
2,4-DINITROPHENOL	NE	120	122		0.42	U	0.47	U	0.4	U	0.39	U	0.44	U	0.38	U	0.46	U	0.38	U	0.44	UJ	0.38	U	0.45	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
2,6-DINITROTOLUENE	NE	61	61.1		0.025	U	0.028	U	0.023	U	0.023	U	0.026	U	0.023	U	0.027	U	0.023	U	0.026	U	0.022	U	0.027	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
2-CHLOROPHENOL	NE	390	391		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
2-METHYLNAPHTHALENE	NE	230	NE		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
2-METHYLPHENOL	NE	3100	NE		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
2-NITROANILINE	NE	610	NE		0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
2-NITROPHENOL	NE	NE	NE		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
3-NITROANILINE	NE	NE	NE		0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.085	U	0.094	U	0.08	U	0.078	U	0.088	U	0.077	U	0.092	U	0.077	U	0.088	U	0.075	U	0.09	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
4-CHLOROANILINE	NE	2.4	NE		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
4-NITROANILINE	NE	24	NE		0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
4-NITROPHENOL	NE	NE	NE		0.17	U	0.19	U	0.16	U	0.16	U	0.18	U	0.15	U	0.18	U	0.15	U	0.18	U	0.15	U	0.18	U
ACENAPHTHENE	NE	3400	3440		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
ACENAPHTHYLENE	NE	NE	NE		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
ACETOPHENONE	NE	7800	7820		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
ANTHRACENE	NE	17000	17200		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
ATRAZINE	NE	2.1	NE		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U

Table 4-1b
Soil Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC531B-IS-0001-071112		OTC531B-IS-0002-071112		OTC531B-IS-0003-071112		OTC531B-IS-0004-071112-FD		OTC531B-IS-0005-071112		OTC531B-IS-0006-071112		OTC531B-IS-0007-071112		OTC531B-IS-0008-071112		OTC531B-IS-0009-071112		OTC531B-IS-0010-071112		OTC531B-IS-0011-071112	
				Sample Date	7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																										
BENZALDEHYDE	NE	7800	NE		0.21	U	0.24	U	0.2	U	0.2	U	0.22	U	0.19	U	0.23	U	0.19	U	0.22	U	0.19	U	0.23	U
BENZO(A)ANTHRACENE	NE	0.15	1.48		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
BENZO(A)PYRENE	NE	0.015	0.148		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
BENZO(G,H,I)PERYLENE	NE	NE	NE		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
BENZYL BUTYL PHTHALATE	NE	260	NE		0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
BIPHENYL	NE	51	57.1		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347		0.085	U	0.094	U	0.08	U	0.078	U	0.088	U	0.077	U	0.092	U	0.077	U	0.088	U	0.075	U	0.09	U
CAPROLACTAM	NE	31000	NE		0.068	U	0.075	U	0.064	U	0.063	U	0.071	U	0.062	U	0.073	U	0.062	U	0.071	UJ	0.06	U	0.072	U
CARBAZOLE	NE	NE	NE		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
CHRYSENE	NE	15	148		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
DIBENZOFURAN	NE	78	NE		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
DIETHYL PHTHALATE	NE	49000	48900		0.085	U	0.094	U	0.08	U	0.078	U	0.088	U	0.077	U	0.092	U	0.077	U	0.088	U	0.075	U	0.09	U
DIMETHYL PHTHALATE	NE	611000	611000		0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
DI-N-BUTYL PHTHALATE	NE	6100	6110		0.085	U	0.094	U	0.08	U	0.078	U	0.088	U	0.077	U	0.092	U	0.077	U	0.088	U	0.075	U	0.09	U
DI-N-OCTYLPHTHALATE	NE	730	NE		0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
FLUORANTHENE	NE	2300	2290		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
FLUORENE	NE	2300	2290		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
HEXACHLOROBENZENE	NE	0.3	3.04		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
HEXACHLOROBUTADIENE	NE	6.2	61.1		0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367		0.093	U	0.1	U	0.088	U	0.086	U	0.097	U	0.085	U	0.1	U	0.085	U	0.097	U	0.083	U	0.099	U
HEXACHLOROETHANE	NE	12	42.8		0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
ISOPHORONE	NE	510	5120		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	UJ	0.019	U	0.023	U
M,P-CRESOL	NE	NE	NE		0.031	U	0.034	U	0.029	U	0.028	U	0.032	U	0.028	U	0.033	U	0.028	U	0.032	U	0.027	U	0.032	U
NAPHTHALENE	NE	3.6	43.0		0.034	U	0.038	U	0.032	U	0.031	U	0.035	U	0.031	U	0.037	U	0.031	U	0.035	U	0.03	U	0.036	U
NITROBENZENE	NE	4.8	53.5		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
N-NITROSODIPHENYLAMINE	NE	99	993		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
PENTACHLOROPHENOL	NE	0.89	8.94		0.25	U	0.28	U	0.24	U	0.23	U	0.26	U	0.23	U	0.28	U	0.23	U	0.27	U	0.23	U	0.27	U
PHENANTHRENE	NE	1830	1830		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
PHENOL	NE	18000	18300		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
PYRENE	NE	1700	1720		0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U

Table 4-1b
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Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531B-IS-0001-071112		OTC531B-IS-0002-071112		OTC531B-IS-0003-071112		OTC531B-IS-0004-071112-FD		OTC531B-IS-0005-071112		OTC531B-IS-0006-071112		OTC531B-IS-0007-071112		OTC531B-IS-0008-071112		OTC531B-IS-0009-071112		OTC531B-IS-0010-071112		OTC531B-IS-0011-071112	
			Sample Date	7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012	
			Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																									
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
1,3-DINITROBENZENE	NE	6.10	NE	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
2,4-DINITROTOLUENE	NE	1.60	15.7	0.078	U	0.09	U	0.084	U	0.079	U	0.089	U	0.087	U	0.088	U	0.08	U	0.089	U	0.089	U	0.078	U
2,6-DINITROTOLUENE	NE	61.0	61.1	0.07	U	0.081	U	0.076	U	0.071	U	0.079	U	0.078	U	0.079	U	0.072	U	0.079	U	0.079	U	0.07	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
2-NITROTOLUENE	NE	2.90	29.1	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
3-NITROTOLUENE	NE	6.10	7.82	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
4-NITROTOLUENE	NE	30.0	244.4	0.081	U	0.094	U	0.088	U	0.082	U	0.092	U	0.091	U	0.092	U	0.083	U	0.092	U	0.092	U	0.081	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
NITROBENZENE	NE	4.80	53.5	0.074	U	0.087	U	0.081	U	0.076	U	0.085	U	0.084	U	0.085	U	0.077	U	0.085	U	0.085	U	0.074	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
TETRYL	NE	240.0	244.0	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
METALS (mg/kg)																									
ALUMINUM	13722	77000	78000	**2070**		**1830**		**5210**		**3500**		**2290**		**18000**		**5280**		**13800**		**1670**		**16900**		**1720**	
ANTIMONY	1.6	31	31.3	1.1	U	1.2	U	0.95	U	1.2	U	1	U	1	U	1.1	U	0.79	U	1.2	U	0.88	U	1.4	UJ
ARSENIC	3.7	0.39	3.90	1.1	U	1.2	U	**1.8**	J	1.2	U	1	U	**3.6**	J	**1.4**	J	**3.2**	J	1.2	U	**3.1**	J	1.4	U
BARIUM	169.3	15000	15600	**29.1**	J	**14.7**	J	**57.6**	J	**38.4**	J	**19.6**	J	**118**		**53.8**	J	**67.8**	J	**19.3**	J	**103**		**16.9**	J
BERYLLIUM	1.6	160	156	0.54	U	0.62	U	0.47	U	0.58	U	0.52	U	**0.74**	J	0.53	U	**0.6**	J	0.6	U	**0.73**	J	0.68	U
CADMIUM	0.3	70	70.3	0.54	U	0.62	U	0.47	U	0.58	U	0.52	U	0.51	U	0.53	U	0.39	U	0.6	U	0.44	U	0.68	U
CALCIUM	317332	NE	NE	**241000**		**225000**		**132000**		**167000**		**197000**		**87800**		**163000**		**73000**		**180000**		**78900**		**228000**	
CHROMIUM[d]	25	117000	117000	**1.7**	J	**2**	J	**4.7**		**3.3**	J	**2.6**	J	**15.9**		**5.6**		**12.4**		**1.5**	J	**14.6**		**1.7**	J
COBALT	7.7	23	NE	**0.9**	J	0.62	U	**2.1**	J	**1.1**	J	**0.63**	J	**5.5**	J	**1.8**	J	**4.6**	J	**0.78**	J	**5.4**	J	0.68	U
COPPER	13	3100	3130	**2.3**	J	**2.3**	J	**3.4**	J	**2.2**	J	**1.5**	J	**13.6**		**3.8**	J	**10.2**		1.2	U	**13.1**		1.4	U
IRON	23049	55000	54800	**1620**		**1740**		**4810**		**3200**		**2170**		**15500**		**4870**		**12600**		**1560**		**14700**		**1570**	
LEAD	10.9	400	400	**1.4**	J	**1.2**	J	**2.9**	J	**1.7**	J	**0.76**	J	**9**	J	**2.8**	J	**7.5**	J	**0.81**	J	**9.1**		0.68	U
MAGNESIUM	16991	NE	NE	**3270**		**1680**	J	**2580**		**1870**	J	**1950**	J	**9510**		**3210**		**5250**		**1030**	J	**12200**		**1280**	J
MANGANESE	393	1800	1860	**34.7**		**26.7**		**82**		**59.7**		**37.2**		**387**		**98.5**		**292**		**15**		**400**		**39.6**	J
MERCURY	0.0108	10	15.6	0.01	U	0.011	U	0.0092	U	0.0094	U	0.011	U	0.0093	U	**0.012**	J	**0.014**	J	0.01	U	**0.01**	J	0.01	U
NICKEL	17.4	1500	1560	**1.4**	J	**1.1**	J	**4.5**	J	**2.7**	J	**1.3**	J	**12.3**	J	**3.6**	J	**9.9**	J	**0.83**	J	**12.4**	J	**1.3**	J
POTASSIUM	5077	NE	NE	**684**	J	**587**	J	**1310**	J	**944**	J	**691**	J	**5320**		**1530**	J	**3920**		**501**	J	**5550**		**460**	J
SELENIUM	1.4	390	391	2.2	U	2.5	U	1.9	U	2.3	U	2.1	U	2.1	U	2.1	U	1.6	U	2.4	U	1.8	U	2.7	U
SILVER	1.1	390	391	0.54	U	0.62	U	0.47	U	0.58	U	0.52	U	0.51	U	0.53	U	0.39	U	0.6	U	0.44	U	0.68	U
SODIUM	5196	NE	NE	**941**	J	**1890**	J	**1110**	J	**850**	J	**2230**	J	**2610**	J	**1680**	J	**1440**	J	**832**	J	**2600**	J	**1210**	J
THALLIUM	1.3	0.78	0.782	1.4	U	1.6	U	1.2	U	1.5	U	1.3	U	1.3	U	1.4	U	1	U	1.6	U	1.1	U	1.8	U
VANADIUM	42.6	390	391	**4.1**	J	**3.3**	J	**11**	J	**7.1**	J	**5**	J	**24.9**	J	**9.3**	J	**20.6**		**2.8**	J	**22.7**		**3**	J
ZINC	54.6	23000	23500	**4.7**	J	**4.6**	J	**14**		**8.6**	J	**5.4**	J	**51.3**		**14**		**38.6**		**3.1**	J	**50**		**3.9**	J

Table 4-1b
Soil Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC531B-IS-0001-071112		OTC531B-IS-0002-071112		OTC531B-IS-0003-071112		OTC531B-IS-0004-071112-FD		OTC531B-IS-0005-071112		OTC531B-IS-0006-071112		OTC531B-IS-0007-071112		OTC531B-IS-0008-071112		OTC531B-IS-0009-071112		OTC531B-IS-0010-071112		OTC531B-IS-0011-071112	
				Sample Date	7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																										
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93		0.0087	U	0.0092	U	0.0079	U	0.0078	U	0.0088	U	0.0078	U	0.0091	U	0.0075	U	0.0088	U	0.0076	U	0.0091	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49		0.011	U	0.012	U	0.0099	U	0.0097	U	0.011	U	0.0097	U	0.011	U	0.0094	U	0.011	U	0.0095	U	0.011	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49		0.011	U	0.012	U	0.0099	U	0.0097	U	0.011	U	0.0097	U	0.011	U	0.0094	U	0.011	U	0.0095	U	0.011	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22		0.0087	U	0.0092	U	0.0079	U	0.0078	U	0.0088	U	0.0078	U	0.0091	U	0.0075	U	0.0088	U	0.0076	U	0.0091	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22		0.0087	U	0.0092	U	0.0079	U	0.0078	U	0.0088	U	0.0078	U	0.0091	U	0.0075	U	0.0088	U	0.0076	U	0.0091	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12		0.0087	U	0.0092	U	0.0079	U	0.0078	U	0.0088	U	0.0078	U	0.0091	U	0.0075	U	0.0088	U	0.0076	U	0.0091	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22		0.0087	U	0.0092	U	0.0079	U	0.0078	U	0.0088	U	0.0078	U	0.0091	U	0.0075	U	0.0088	U	0.0076	U	0.0091	U
PETROLEUM HYDROCARBONS (mg/kg)																										
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000		4	U	4.4	U	3.6	U	3	U	3.1	U	3.3	U	3.4	U	2.6	U	3.4	U	3.1	U	3.1	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000		4.3	U	4.6	U	4	U	3.9	U	4.4	U	3.9	U	4.5	U	3.8	U	4.4	U	3.7	U	4.6	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000		4.3	U	4.6	U	4	U	3.9	U	4.4	U	3.9	U	4.5	U	3.8	U	4.4	U	3.7	U	4.6	U
CYANIDE (mg/kg)																										
CYANIDE	NE	22.0	46.9		0.075	U	0.082	U	0.07	U	0.068	U	0.08	U	0.07	U	0.081	U	0.066	U	0.08	U	0.067	U	0.081	U
TRITIUM (pCi/g)																										
TRITIUM	NE	NE	NE		5.36	U	5.41	U	5.31	U	5.5	U	5.51	U	5.42	U	5.53	U	5.37	U	5.49	U	5.37	U	5.43	U

Table 4-1b
Soil Analytical Data
Buidling 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, February, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
EPA = U.S. Environmental Protection Agency
FD = field duplicate
ft bgs = feet below ground surface
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Table 4-1c
Soil Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC531C-IS-0001-071312		OTC531C-IS-0002-071312		OTC531C-IS-0003-071312		OTC531C-IS-0004-071312-FD		OTC531C-IS-0005-071312		OTC531C-IS-0006-071312		OTC531C-IS-0007-071312		OTC531C-IS-0008-071312		OTC531C-IS-0009-071312		OTC531C-IS-0010-071312		OTC531C-IS-0011-071312	
				Sample Date	7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**79.5**		**69.4**		**81.6**		**80.5**		**74**		**75.2**		**72.4**		**81.2**		**71.3**		**84.9**		**69.8**	
VOLATILES (mg/kg)																										
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0015	U	0.0014	U	0.0011	U	0.0010	U	0.0011	U	0.0015	U	0.0012	U	0.0014	U	0.0013	U	0.0012	U	0.0014	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0016	U	0.0015	U	0.0012	U	0.0011	U	0.0012	U	0.0016	U	0.0013	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0023	U	0.0022	U	0.0016	U	0.0015	U	0.0017	U	0.0023	U	0.0018	U	0.0021	U	0.002	U	0.0019	U	0.0022	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0015	U	0.0014	U	0.0011	U	0.0010	U	0.0011	U	0.0015	U	0.0012	U	0.0014	U	0.0013	U	0.0012	U	0.0014	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0015	U	0.0014	U	0.0011	U	0.0010	U	0.0011	U	0.0015	U	0.0012	U	0.0014	U	0.0013	U	0.0012	U	0.0014	U
1,1-DICHLOROETHENE	NE	240	449		0.0019	U	0.0018	U	0.0013	U	0.0012	U	0.0014	U	0.0019	U	0.0015	U	0.0017	U	0.0017	U	0.0016	U	0.0018	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0016	U	0.0015	U	0.0012	U	0.0011	U	0.0012	U	0.0016	U	0.0013	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0031	U	0.0029	U	0.0022	U	0.002	U	0.0023	U	0.0031	U	0.0025	U	0.0029	U	0.0027	U	0.0026	U	0.0029	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.0014	U	0.0013	U	0.00096	U	0.00089	U	0.0010	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0013	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0015	U	0.0014	U	0.0011	U	0.0010	U	0.0011	U	0.0015	U	0.0012	U	0.0014	U	0.0013	U	0.0012	U	0.0014	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.0014	U	0.0013	U	0.00096	U	0.00089	U	0.0010	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0013	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0016	U	0.0015	U	0.0012	U	0.0011	U	0.0012	U	0.0016	U	0.0013	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0016	U	0.0015	U	0.0012	U	0.0011	U	0.0012	U	0.0016	U	0.0013	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0015	U	0.0014	U	0.0011	U	0.0010	U	0.0011	U	0.0015	U	0.0012	U	0.0014	U	0.0013	U	0.0012	U	0.0014	U
2-HEXANONE	NE	210	NE		0.0074	U	0.0069	U	0.0052	U	0.0048	U	0.0053	U	0.0072	U	0.0059	U	0.0067	U	0.0064	U	0.0061	U	0.0068	U
ACETONE	NE	61000	66600		0.027	U	0.026	U	0.019	U	0.018	U	0.02	U	0.027	U	0.022	U	0.025	U	0.024	U	0.025	J	0.025	U
BENZENE	NE	1.1	15.4		0.002	U	0.0019	U	0.0014	U	0.0013	U	0.0015	U	0.002	U	0.0016	U	0.0019	U	0.0018	U	0.0017	U	0.0019	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0015	U	0.0014	U	0.0011	U	0.00097	U	0.0011	U	0.0015	U	0.0012	U	0.0014	U	0.0013	U	0.0012	U	0.0014	U
BROMOFORM	NE	62	616		0.002	U	0.0019	U	0.0014	U	0.0013	U	0.0015	U	0.002	U	0.0016	U	0.0019	U	0.0018	U	0.0017	U	0.0019	U
BROMOMETHANE	NE	7.3	16.5		0.0027	U	0.0026	U	0.0019	U	0.0018	U	0.002	U	0.0027	U	0.0022	U	0.0025	U	0.0024	U	0.0023	U	0.0025	U
CARBON DISULFIDE	NE	820	1530		0.0027	U	0.0026	U	0.0019	U	0.0018	U	0.002	U	0.0027	U	0.0022	U	0.0025	U	0.0024	U	0.0023	U	0.0025	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0025	U	0.0023	U	0.0017	U	0.0016	U	0.0018	U	0.0024	U	0.002	U	0.0022	U	0.0021	U	0.002	U	0.0023	U
CHLOROBENZENE	NE	290	376		0.0014	U	0.0013	U	0.00096	U	0.00089	U	0.00099	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0013	U
CHLOROETHANE	NE	15000	29800		0.0027	U	0.0026	U	0.0019	U	0.0018	U	0.002	U	0.0027	U	0.0022	U	0.0025	U	0.0024	U	0.0023	U	0.0025	U
CHLOROFORM	NE	0.29	5.86		0.0016	U	0.0015	U	0.0012	U	0.0011	U	0.0012	U	0.0016	U	0.0013	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U
CHLOROMETHANE	NE	120	275		0.0027	U	0.0026	U	0.0019	U	0.0018	U	0.002	U	0.0027	U	0.0022	U	0.0025	U	0.0024	U	0.0023	U	0.0025	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.002	U	0.0019	U	0.0014	U	0.0013	U	0.0015	U	0.002	U	0.0016	U	0.0019	U	0.0018	U	0.0017	U	0.0019	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0014	U	0.0013	U	0.00096	U	0.00089	U	0.00099	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0013	U
CYCLOHEXANE	NE	7000	NE		0.0019	U	0.0018	U	0.0013	U	0.0012	U	0.0014	U	0.0019	U	0.0015	U	0.0017	U	0.0017	U	0.0016	U	0.0018	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.0014	U	0.0013	U	0.00096	U	0.00089	U	0.00099	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0013	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.002	U	0.0019	U	0.0014	U	0.0013	U	0.0015	U	0.002	U	0.0016	U	0.0019	U	0.0018	U	0.0017	U	0.0019	U
ETHYLBENZENE	NE	5.4	68.4		0.0014	U	0.0013	U	0.00096	U	0.00089	U	0.00099	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0013	U
ISOPROPYLBENZENE	NE	2100	2430		0.0015	U	0.0014	U	0.0011	U	0.00097	U	0.0011	U	0.0015	U	0.0012	U	0.0014	U	0.0013	U	0.0012	U	0.0014	U
METHYL ACETATE	NE	78000	78200		0.017	U	0.016	U	0.012	U	0.011	U	0.012	U	0.017	U	0.014	U	0.016	U	0.015	U	0.014	U	0.016	U
METHYL ETHYL KETONE	NE	28000	37100		0.0083	U	0.0078	U	0.0059	U	0.0054	U	0.006	U	0.0082	U	0.0066	U	0.0076	U	0.007	U	0.0069	U	0.0077	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0075	U	0.0071	U	0.0053	U	0.00490	U	0.0054	U	0.0074	U	0.006	U	0.0068	U	0.0065	U	0.0062	U	0.007	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0018	U	0.0017	U	0.0012	U	0.0012	U	0.0013	U	0.0017	U	0.0014	U	0.0016	U	0.0015	U	0.0015	U	0.0016	U
METHYLENE CHLORIDE	NE	56	409		0.0063	U	0.0059	U	0.0044	U	0.0041	U	0.0045	U	0.0062	U	0.005	U	0.0057	U	0.0055	U	0.0052	U	0.0058	U

Table 4-1c
Soil Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC531C-IS-0001-071312		OTC531C-IS-0002-071312		OTC531C-IS-0003-071312		OTC531C-IS-0004-071312-FD		OTC531C-IS-0005-071312		OTC531C-IS-0006-071312		OTC531C-IS-0007-071312		OTC531C-IS-0008-071312		OTC531C-IS-0009-071312		OTC531C-IS-0010-071312		OTC531C-IS-0011-071312	
				Sample Date	7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																										
STYRENE	NE	6300	7280		0.0035	U	0.0033	U	0.0025	U	0.0023	U	0.0026	U	0.0035	U	0.0028	U	0.0032	U	0.0031	U	0.0029	U	0.0033	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0027	U	0.0026	U	0.0019	U	0.0018	U	0.002	U	0.0027	U	0.0022	U	0.0025	U	0.0024	U	0.0023	U	0.0025	U
TETRACHLOROETHYLENE	NE	22	7.02		0.0014	U	0.0013	U	0.00096	U	0.00089	U	0.00099	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0013	U
TOLUENE	NE	5000	5270		0.0016	U	0.0015	U	0.0012	U	0.0011	U	0.0012	U	0.0016	U	0.0013	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.002	U	0.0019	U	0.0014	U	0.0013	U	0.0015	U	0.002	U	0.0016	U	0.0019	U	0.0018	U	0.0017	U	0.0019	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0015	U	0.0014	U	0.0011	U	0.00097	U	0.0011	U	0.0015	U	0.0012	U	0.0014	U	0.0013	U	0.0012	U	0.0014	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0016	U	0.0015	U	0.0012	U	0.0011	U	0.0012	U	0.0016	U	0.0013	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0027	U	0.0026	U	0.0019	U	0.0018	U	0.002	U	0.0027	U	0.0022	U	0.0025	U	0.0024	U	0.0023	U	0.0025	U
VINYL CHLORIDE	NE	0.06	0.728		0.002	U	0.0019	U	0.0014	U	0.0013	U	0.0015	U	0.002	U	0.0016	U	0.0019	U	0.0018	U	0.0017	U	0.0019	U
XYLENES, TOTAL	NE	630	814		0.0044	U	0.0041	U	0.0031	U	0.0028	U	0.0032	U	0.004	U	0.0035	U	0.004	U	0.0038	U	0.0036	U	0.004	U
SEMIVOLATILES (mg/kg)																										
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
2,4-DICHLOROPHENOL	NE	180	183		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.026	U	0.03	U	0.026	U	0.026	U	0.028	U	0.028	U	0.029	U	0.025	U	0.029	U	0.025	U	0.03	U
2,4-DINITROPHENOL	NE	120	122		0.42	U	0.48	U	0.41	U	0.41	U	0.45	U	0.44	U	0.46	U	0.4	U	0.46	U	0.39	U	0.48	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
2,6-DINITROTOLUENE	NE	61	61.1		0.025	U	0.028	U	0.024	U	0.024	U	0.026	U	0.026	U	0.027	U	0.024	U	0.027	U	0.023	U	0.028	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
2-CHLOROPHENOL	NE	390	391		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
2-METHYLNAPHTHALENE	NE	230	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
2-METHYLPHENOL	NE	3100	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
2-NITROANILINE	NE	610	NE		0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
2-NITROPHENOL	NE	NE	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
3-NITROANILINE	NE	NE	NE		0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.084	U	0.095	U	0.081	U	0.083	U	0.09	U	0.089	U	0.091	U	0.081	U	0.093	U	0.079	U	0.095	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
4-CHLOROANILINE	NE	2.4	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
4-NITROANILINE	NE	24	NE		0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
4-NITROPHENOL	NE	NE	NE		0.17	U	0.19	U	0.16	U	0.17	U	0.18	U	0.18	U	0.18	U	0.16	U	0.19	U	0.16	U	0.19	U
ACENAPHTHENE	NE	3400	3440		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
ACENAPHTHYLENE	NE	NE	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
ACETOPHENONE	NE	7800	7820		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
ANTHRACENE	NE	17000	17200		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
ATRAZINE	NE	2.1	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U

Table 4-1c
Soil Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC531C-IS-0001-071312		OTC531C-IS-0002-071312		OTC531C-IS-0003-071312		OTC531C-IS-0004-071312-FD		OTC531C-IS-0005-071312		OTC531C-IS-0006-071312		OTC531C-IS-0007-071312		OTC531C-IS-0008-071312		OTC531C-IS-0009-071312		OTC531C-IS-0010-071312		OTC531C-IS-0011-071312	
				Sample Date	7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																										
BENZALDEHYDE	NE	7800	NE		0.21	U	0.24	U	0.2	U	0.21	U	0.22	U	0.22	U	0.23	U	0.2	U	0.23	U	0.2	U	0.24	U
BENZO(A)ANTHRACENE	NE	0.15	1.48		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
BENZO(A)PYRENE	NE	0.015	0.148		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
BENZO(G,H,I)PERYLENE	NE	NE	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
BENZYL BUTYL PHTHALATE	NE	260	NE		0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
BIPHENYL	NE	51	57.1		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347		0.084	U	0.095	U	0.081	U	0.083	U	0.09	U	0.089	U	0.091	U	0.081	U	0.093	U	0.079	U	0.095	U
CAPROLACTAM	NE	31000	NE		0.067	U	0.076	U	0.065	U	0.066	U	0.072	U	0.071	U	0.073	U	0.065	U	0.074	U	0.063	U	0.076	U
CARBAZOLE	NE	NE	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
CHRYSENE	NE	15	148		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
DIBENZOFURAN	NE	78	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
DIETHYL PHTHALATE	NE	49000	48900		0.084	U	0.095	U	0.081	U	0.083	U	0.09	U	0.089	U	0.091	U	0.081	U	0.093	U	0.079	U	0.095	U
DIMETHYL PHTHALATE	NE	611000	611000		0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
DI-N-BUTYL PHTHALATE	NE	6100	6110		0.084	U	0.095	U	0.081	U	0.083	U	0.09	U	0.089	U	0.091	U	0.081	U	0.093	U	0.079	U	0.095	U
DI-N-OCTYLPHTHALATE	NE	730	NE		0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
FLUORANTHENE	NE	2300	2290		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
FLUORENE	NE	2300	2290		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
HEXACHLOROBENZENE	NE	0.3	3.04		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
HEXACHLOROBUTADIENE	NE	6.2	61.1		0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367		0.092	U	0.1	U	0.089	U	0.091	U	0.099	U	0.098	U	0.100	U	0.089	U	0.1	U	0.086	U	0.1	U
HEXACHLOROETHANE	NE	12	42.8		0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
ISOPHORONE	NE	510	5120		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
M,P-CRESOL	NE	NE	NE		0.030	U	0.034	U	0.029	U	0.03	U	0.032	U	0.032	U	0.033	U	0.029	U	0.033	U	0.028	U	0.034	U
NAPHTHALENE	NE	3.6	43.0		0.034	U	0.038	U	0.032	U	0.033	U	0.036	U	0.035	U	0.036	U	0.032	U	0.037	U	0.031	U	0.038	U
NITROBENZENE	NE	4.8	53.5		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
N-NITROSODIPHENYLAMINE	NE	99	993		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
PENTACHLOROPHENOL	NE	0.89	8.94		0.250	U	0.29	U	0.24	U	0.25	U	0.27	U	0.27	U	0.27	U	0.24	U	0.28	U	0.24	U	0.29	U
PHENANTHRENE	NE	1830	1830		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
PHENOL	NE	18000	18300		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
PYRENE	NE	1700	1720		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U

Table 4-1c
Soil Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC531C-IS-0001-071312		OTC531C-IS-0002-071312		OTC531C-IS-0003-071312		OTC531C-IS-0004-071312-FD		OTC531C-IS-0005-071312		OTC531C-IS-0006-071312		OTC531C-IS-0007-071312		OTC531C-IS-0008-071312		OTC531C-IS-0009-071312		OTC531C-IS-0010-071312		OTC531C-IS-0011-071312	
				Sample Date	7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																										
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
1,3-DINITROBENZENE	NE	6.10	NE	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
2,4-DINITROTOLUENE	NE	1.60	15.7	0.081	U	0.094	U	0.072	U	0.080	U	0.091	U	0.077	U	0.076	U	0.074	U	0.087	U	0.094	U	0.09	U
2,6-DINITROTOLUENE	NE	61.0	61.1	0.072	U	0.084	U	0.065	U	0.071	U	0.082	U	0.069	U	0.068	U	0.066	U	0.078	U	0.084	U	0.081	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
2-NITROTOLUENE	NE	2.90	29.1	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
3-NITROTOLUENE	NE	6.10	7.82	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
4-NITROTOLUENE	NE	30.0	244.4	0.084	U	0.098	U	0.075	U	0.083	U	0.095	U	0.080	U	0.079	U	0.077	U	0.091	U	0.098	U	0.094	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
NITROBENZENE	NE	4.80	53.5	0.077	U	0.090	U	0.069	U	0.076	U	0.087	U	0.074	U	0.073	U	0.071	U	0.084	U	0.09	U	0.086	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
TETRYL	NE	240.0	244.0	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
METALS (mg/kg)																										
ALUMINUM	13722	77000	78000	**2520**		**1380**		**7360**		**6190**		**1550**		**2410**		**2000**		**8420**		**1890**		**10100**		**1620**	
ANTIMONY	1.6	31	31.3	1	U	1.2	U	1.1	U	1.2	U	1.1	U	0.95	U	1.3	U	1.1	U	1.3	U	1	U	1.2	U
ARSENIC	3.7	0.39	3.90	1	U	1.2	U	**1.8**	J	1.2	U	1.1	U	0.95	U	1.3	U	**1.7**	J	1.3	U	**2.5**	J	1.2	U
BARIUM	169.3	15000	15600	**30.2**	J	**13.6**	J	**68.3**	J	**46.9**	J	**14.2**	J	**33.7**	J	**19.9**	J	**97.5**	J	**23.1**	J	**87.1**	J	**19.6**	J
BERYLLIUM	1.6	160	156	0.52	U	0.59	U	0.57	U	0.59	U	0.56	U	0.47	U	0.64	U	0.54	U	0.67	U	0.52	U	0.59	U
CADMIUM	0.3	70	70.3	0.52	U	0.59	U	0.57	U	0.59	U	0.56	U	0.47	U	0.64	U	0.54	U	0.67	U	0.52	U	0.59	U
CALCIUM	317332	NE	NE	**218000**		**241000**		**204000**		**204000**		**215000**		**246000**		**262000**		**181000**		**246000**		**146000**		**238000**	
CHROMIUM[d]	25	117000	117000	**2.3**	J	**1.4**	J	**8.6**		**7.2**		**1.4**	J	**2.1**	J	**2.5**	J	**7.2**		**2**	J	**8.8**		**1.7**	J
COBALT	7.7	23	NE	**1.2**	J	0.59	U	**3.4**	J	**2.4**	J	0.56	U	**1.1**	J	**0.64**	J	**2.7**	J	0.67	U	**3.6**	J	0.59	U
COPPER	13	3100	3130	**2.3**	J	1.2	U	**3.7**	J	**3**	J	**3.3**	J	**2**	J	**1.5**	J	**6**	J	**1.7**	J	**8.2**	J	**1.5**	J
IRON	23049	55000	54800	**2230**		**1260**		**7510**		**6120**		**1630**		**2020**		**1810**		**7040**		**1700**		**8750**		**1470**	
LEAD	10.9	400	400	**1.1**	J	0.59	U	**4**	J	**2.9**	J	0.56	U	**0.66**	J	**0.74**	J	**4.1**	J	**0.73**	J	**6.3**	J	0.59	U
MAGNESIUM	16991	NE	NE	**2160**	J	**857**	J	**6070**		**6280**		**970**	J	**3340**		**1550**	J	**4980**		**1070**	J	**7520**		**908**	J
MANGANESE	393	1800	1860	**37.5**		**20.7**		**142**		**111**		**26**		**39.2**		**38.3**		**145**		**34.8**		**208**		**25.5**	
MERCURY	0.0108	10	15.6	0.0098	U	0.012	U	0.0097	U	0.0097	U	0.01	U	0.01	U	0.011	U	0.0096	U	0.011	U	0.0092	U	0.011	U
NICKEL	17.4	1500	1560	**2.4**	J	**0.84**	J	**7.4**	J	**6.1**	J	**0.77**	J	**2.5**	J	**1.4**	J	**5.8**	J	**1.2**	J	**7.8**	J	**0.89**	J
POTASSIUM	5077	NE	NE	**721**	J	**412**	J	**1950**	J	**1640**	J	**424**	J	**933**	J	**589**	J	**3020**	J	**571**	J	**3800**	J	**492**	J
SELENIUM	1.4	390	391	2.1	U	2.4	U	2.3	U	2.4	U	2.3	U	1.9	U	2.6	U	2.2	U	2.7	U	2.1	U	2.3	U
SILVER	1.1	390	391	0.52	U	0.59	U	0.57	U	0.59	U	0.56	U	0.47	U	0.64	U	0.54	U	0.67	U	0.52	U	0.59	U
SODIUM	5196	NE	NE	580	U	650	U	**972**	J	**932**	J	620	U	**2950**	J	**774**	J	**2560**	J	740	U	**3250**	J	**758**	J
THALLIUM	1.3	0.78	0.782	1.4	U	1.5	U	1.5	U	1.5	U	1.5	U	1.2	U	1.7	U	1.4	U	1.8	U	1.4	U	1.5	U
VANADIUM	42.6	390	391	**8.8**	J	**2.9**	J	**15**	J	**11.9**	J	**3.3**	J	**6.4**	J	**3.8**	J	**13.4**	J	**3.3**	J	**17.6**	J	**2.9**	J
ZINC	54.6	23000	23500	**5.3**	J	3	U	**19.5**		**16.1**		**3.3**	J	**5.3**	J	**5.1**	J	**20.9**		**4.1**	J	**28**		**3.2**	J

Table 4-1c
Soil Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531C-IS-0001-071312		OTC531C-IS-0002-071312		OTC531C-IS-0003-071312		OTC531C-IS-0004-071312-FD		OTC531C-IS-0005-071312		OTC531C-IS-0006-071312		OTC531C-IS-0007-071312		OTC531C-IS-0008-071312		OTC531C-IS-0009-071312		OTC531C-IS-0010-071312		OTC531C-IS-0011-071312	
			Sample Date	7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012	
			Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																									
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.008	U	0.0097	U	0.0083	U	0.0083	U	0.0089	U	0.0087	U	0.0091	U	0.008	U	0.0092	U	0.008	U	0.0097	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.010	U	0.012	U	0.0100	U	0.0100	U	0.011	U	0.011	U	0.011	U	0.010	U	0.011	U	0.010	U	0.012	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.010	U	0.012	U	0.0100	U	0.0100	U	0.011	U	0.011	U	0.011	U	0.010	U	0.011	U	0.010	U	0.012	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.008	U	0.0097	U	0.0083	U	0.0083	U	0.0089	U	0.0087	U	0.0091	U	0.008	U	0.0092	U	0.008	U	0.0097	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.008	U	0.0097	U	0.0083	U	0.0083	U	0.0089	U	0.0087	U	0.0091	U	0.008	U	0.0092	U	0.008	U	0.0097	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.008	U	0.0097	U	0.0083	U	0.0083	U	0.0089	U	0.0087	U	0.0091	U	0.008	U	0.0092	U	0.008	U	0.0097	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.008	U	0.0097	U	0.0083	U	0.0083	U	0.0089	U	0.0087	U	0.0091	U	0.008	U	0.0092	U	0.008	U	0.0097	U
PETROLEUM HYDROCARBONS (mg/kg)																									
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	3.9	U	3.8	U	2.9	U	3.8	U	3.2	U	5.3	U	3.5	U	3.7	U	4.2	U	3.5	U	4.4	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	4.2	U	4.8	U	4.1	U	4.1	U	4.4	U	4.5	U	4.6	U	4.1	U	4.8	U	3.9	U	4.8	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000	4.2	U	4.8	U	4.1	U	4.1	U	4.4	U	4.5	U	4.6	U	4.1	U	4.8	U	3.9	U	4.8	U
CYANIDE (mg/kg)																									
CYANIDE	NE	22.0	46.9	0.075	U	0.086	U	0.14	U	0.075	U	0.081	U	0.08	U	0.083	U	0.071	U	0.081	U	0.071	U	0.086	U
TRITIUM (pCi/g)																									
TRITIUM	NE	NE	NE	4.9	U	4.81	U	4.86	U	4.83	U	4.81	U	4.9	U	4.18	U	4.98	U	4.67	U	4.91	U	4.89	U

Table 4-1c
Soil Analytical Data
Buidling 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, February, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
EPA = U.S. Environmental Protection Agency
FD = field duplicate
ft bgs = feet below ground surface
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Table 4-2a
Groundwater Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531A-GW-513A1-071712	
			Sample date	7/17/2012	
			Location	MW-01	
	Background Values - Unfiltered GW[a]	EPA MCL[b]	NMWQCC WQS[c]	Result	VQ
TOTAL DISSOLVED SOLIDS (mg/L)	NE	NE	10,000	**31,500**	
VOLATILES (µg/L)					
1,1,1-TRICHLOROETHANE	NE	200	60	NA	
1,1,2,2-TETRACHLOROETHANE	NE	NE	10	NA	
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	NE	NE	NA	
1,1,2-TRICHLOROETHANE	NE	5	10	NA	
1,1-DICHLOROETHANE	NE	NE	25	NA	
1,1-DICHLOROETHENE	NE	7	5	NA	
1,2,4-TRICHLOROBENZENE	NE	70	NE	NA	
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.20	NE	NA	
1,2-DIBROMOETHANE	NE	0.05	0.10	NA	
1,2-DICHLOROBENZENE	NE	600	NE	NA	
1,2-DICHLOROETHANE	NE	5	10	NA	
1,2-DICHLOROPROPANE	NE	5	NE	NA	
1,3-DICHLOROBENZENE	NE	NE	NE	NA	
1,4-DICHLOROBENZENE	NE	75	NE	NA	
2-HEXANONE	NE	NE	NE	NA	
ACETONE	NE	NE	NE	NA	
BENZENE	NE	5	10	NA	
BROMODICHLOROMETHANE	NE	80	NE	NA	
BROMOFORM	NE	80	NE	NA	
BROMOMETHANE	NE	NE	NE	NA	
CARBON DISULFIDE	NE	NE	NE	NA	
CARBON TETRACHLORIDE	NE	5	10	NA	
CHLOROBENZENE	NE	100	NE	NA	
CHLOROETHANE	NE	NE	NE	NA	
CHLOROFORM	NE	80	100	NA	
CHLOROMETHANE	NE	NE	NE	NA	
CIS-1,2-DICHLOROETHYLENE	NE	70	NE	NA	
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	NA	
CYCLOHEXANE	NE	NE	NE	NA	
DIBROMOCHLOROMETHANE	NE	80	NE	NA	
DICHLORODIFLUOROMETHANE	NE	NE	NE	NA	
ETHYLBENZENE	NE	700	750	NA	
ISOPROPYLBENZENE	NE	NE	NE	NA	
METHYL ACETATE	NE	NE	NE	NA	
METHYL ETHYL KETONE	NE	NE	NE	NA	
METHYL ISOBUTYL KETONE	NE	NE	NE	NA	
METHYLCYCLOHEXANE	NE	NE	NE	NA	
METHYLENE CHLORIDE	NE	5	100	NA	
STYRENE	NE	100	NE	NA	
TERT-BUTYL METHYL ETHER	NE	NE	NE	NA	
TETRACHLOROETHYLENE	NE	5	20	NA	
TOLUENE	NE	1000	750	NA	
TRANS-1,2-DICHLOROETHENE	NE	100	NE	NA	
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	NA	
TRICHLOROETHYLENE	NE	5	100	NA	
TRICHLOROFLUOROMETHANE	NE	NE	NE	NA	
VINYL CHLORIDE	NE	2	1	NA	
XYLENES, TOTAL	NE	10000	620	NA	

Table 4-2a
Groundwater Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531A-GW-513A1-071712	
			Sample date	7/17/2012	
			Location	MW-01	
	Background Values - Unfiltered GW[a]	**EPA MCL[b]**	**NMWQCC WQS[c]**	Result	VQ
SEMIVOLATILES (µg/L)					
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	NA	
2,4,5-TRICHLOROPHENOL	NE	NE	NE	NA	
2,4,6-TRICHLOROPHENOL	NE	NE	NE	NA	
2,4-DICHLOROPHENOL	NE	NE	NE	NA	
2,4-DIMETHYLPHENOL	NE	NE	NE	NA	
2,4-DINITROPHENOL	NE	NE	NE	NA	
2,4-DINITROTOLUENE	NE	NE	NE	NA	
2,6-DINITROTOLUENE	NE	NE	NE	NA	
2-CHLORONAPHTHALENE	NE	NE	30	NA	
2-CHLOROPHENOL	NE	NE	NE	NA	
2-METHYLNAPHTHALENE	NE	NE	30	NA	
2-METHYLPHENOL	NE	NE	NE	NA	
2-NITROANILINE	NE	NE	NE	NA	
2-NITROPHENOL	NE	NE	NE	NA	
3,3'-DICHLOROBENZIDINE	NE	NE	NE	NA	
3-NITROANILINE	NE	NE	NE	NA	
4,6-DINITRO-2-METHYLPHENOL	NE	NE	NE	NA	
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	NA	
4-CHLORO-3-METHYLPHENOL	NE	NE	NE	NA	
4-CHLOROANILINE	NE	NE	NE	NA	
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	NA	
4-NITROANILINE	NE	NE	NE	NA	
4-NITROPHENOL	NE	NE	NE	NA	
ACENAPHTHENE	NE	NE	30	NA	
ACENAPHTHYLENE	NE	NE	30	NA	
ACETOPHENONE	NE	NE	NE	NA	
ANTHRACENE	NE	NE	30	NA	
ATRAZINE	NE	3	NE	NA	
BENZALDEHYDE	NE	NE	NE	NA	
BENZO(A)ANTHRACENE	NE	NE	30	NA	
BENZO(A)PYRENE	NE	0.20	0.7	NA	
BENZO(B)FLUORANTHENE	NE	NE	30	NA	
BENZO(G,H,I)PERYLENE	NE	NE	30	NA	
BENZO(K)FLUORANTHENE	NE	NE	30	NA	
BENZYL BUTYL PHTHALATE	NE	NE	NE	NA	
BIPHENYL	NE	NE	NE	NA	
BIS(2-CHLOROETHOXY) METHANE	NE	NE	NE	NA	
BIS(2-CHLOROETHYL) ETHER	NE	NE	NE	NA	
BIS(2-ETHYLHEXYL) PHTHALATE	NE	6	NE	NA	
CAPROLACTAM	NE	NE	NE	NA	
CARBAZOLE	NE	NE	NE	NA	
CHRYSENE	NE	NE	30	NA	
DIBENZ(A,H)ANTHRACENE	NE	NE	30	NA	
DIBENZOFURAN	NE	NE	NE	NA	
DIETHYL PHTHALATE	NE	NE	NE	NA	
DIMETHYL PHTHALATE	NE	NE	NE	NA	
DI-N-BUTYL PHTHALATE	NE	NE	NE	NA	
DI-N-OCTYLPHTHALATE	NE	NE	NE	NA	
FLUORANTHENE	NE	NE	30	NA	
FLUORENE	NE	NE	30	NA	
SEMIVOLATILES - continued (µg/L)					
HEXACHLOROBENZENE	NE	1	NE	NA	
HEXACHLOROBUTADIENE	NE	NE	NE	NA	

Table 4-2a
Groundwater Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531A-GW-513A1-071712	
			Sample date	7/17/2012	
			Location	MW-01	
	Background Values - Unfiltered GW[a]	EPA MCL[b]	NMWQCC WQS[c]	Result	VQ
HEXACHLOROCYCLOPENTADIENE	NE	50	NE	NA	
HEXACHLOROETHANE	NE	NE	NE	NA	
INDENO(1,2,3-C,D)PYRENE	NE	NE	30	NA	
ISOPHORONE	NE	NE	NE	NA	
M,P-CRESOL	NE	NE	NE	NA	
NAPHTHALENE	NE	NE	30	NA	
NITROBENZENE	NE	NE	NE	NA	
N-NITROSODI-N-PROPYLAMINE	NE	NE	NE	NA	
N-NITROSODIPHENYLAMINE	NE	NE	NE	NA	
PENTACHLOROPHENOL	NE	1	NE	NA	
PHENANTHRENE	NE	NE	30	NA	
PHENOL	NE	NE	NE	NA	
PYRENE	NE	NE	30	NA	
EXPLOSIVES (µg/L)					
1,3,5-TRINITROBENZENE	NE	NE	NE	NA	
1,3-DINITROBENZENE	NE	NE	NE	NA	
2,4,6-TRINITROTOLUENE	NE	NE	NE	NA	
2,4-DINITROTOLUENE	NE	NE	NE	NA	
2,6-DINITROTOLUENE	NE	NE	NE	NA	
2-AMINO-4,6-DINITROTOLUENE	NE	NE	NE	NA	
2-NITROTOLUENE	NE	NE	NE	NA	
3-NITROTOLUENE	NE	NE	NE	NA	
4-AMINO-2,6-DINITROTOLUENE	NE	NE	NE	NA	
4-NITROTOLUENE	NE	NE	NE	NA	
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	NE	NE	NA	
NITROBENZENE	NE	NE	NE	NA	
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	NE	NE	NA	
TETRYL	NE	NE	NE	NA	
METALS (µg/L)					
ALUMINUM	1043	NE	NE	NA	
ANTIMONY	6	6	NE	NA	
ARSENIC	10	10	100	NA	
BARIUM	38	2000	1000	NA	
BERYLLIUM	4	4	NE	NA	
CADMIUM	5	5	10	NA	
CALCIUM	1,136,664	NE	NE	NA	
CHROMIUM, TOTAL	12	100	50	NA	
COBALT	36	NE	NE	NA	
COPPER	9.8	1300	1000	NA	
IRON	300	NE	1000	NA	
LEAD	9	15	50	NA	
MAGNESIUM	3,692,782	NE	NE	NA	
MANGANESE	50	NE	200	NA	
MERCURY	0.5	2	2	NA	
NICKEL	22	NE	NE	NA	
POTASSIUM	212,144	NE	NE	NA	
SELENIUM	50	50	50	NA	
SILVER	10	NE	50	NA	
METALS - Continued (µg/L)					
SODIUM	20,989,580	NE	NE	NA	
THALLIUM	2	2	NE	NA	
VANADIUM	90	NE	NE	NA	
ZINC	17	NE	10000	NA	
PCBs (µg/L)					

Table 4-2a
Groundwater Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531A-GW-513A1-071712	
			Sample date	7/17/2012	
			Location	MW-01	
	Background Values - Unfiltered GW[a]	**EPA MCL[b]**	**NMWQCC WQS[c]**	Result	VQ
PCB-1016 (AROCHLOR 1016)	NE	NE	1	NA	
PCB-1221 (AROCHLOR 1221)	NE	NE	1	NA	
PCB-1232 (AROCHLOR 1232)	NE	NE	1	NA	
PCB-1242 (AROCHLOR 1242)	NE	NE	1	NA	
PCB-1248 (AROCHLOR 1248)	NE	NE	1	NA	
PCB-1254 (AROCHLOR 1254)	NE	NE	1	NA	
PCB-1260 (AROCHLOR 1260)	NE	NE	1	NA	
PETROLEUM HYDROCARBONS (µg/L)					
GASOLINE RANGE ORGANICS C6-C10	NE	NE	See individual VOC & SVOC		
DIESEL RANGE ORGANICS C10-C28	NE	NE	400	NA	
OIL RANGE ORGANICS C28-C40	NE	NE	200	NA	
CYANIDE (µg/L)					
CYANIDE	NE	200	200	NA	
TRITIUM (pCi/L)					
TRITIUM	NE	NE	NE	NA	

Table 4-2a
Groundwater Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NM WQCC Water Quality Standard

Value exceeds EPA Maximum Contaminant Level

Bold = parameter detected

[a] *New Mexico Environment Department (NMED), 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," letter to D. Scruggs, Chief, Environmental Restoration Program, Holloman Air Force Base from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, New Mexico Environment Department, March 1.*

[b] *U.S. Environmental Protection Agency (EPA), 2012, National Primary Drinking Water Regulations: List of Drinking Water Contaminants and Maximum Contaminant Levels.*

[c] *New Mexico Water Quality Control Commission, Water Quality Standards, 20.6.2 New Mexico Administrative Code.*

[d] *New Mexico Environment Department (NMED), 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, New Mexico Environment Department, Santa Fe, New Mexico, February, Table 6-2. TPH Screening Guidelines for Potable Groundwater (GW-1), February 2012, Table A-1: NMED Soil Screening Levels, updated June 2012. "Unknown oil" criteria used for Oil Range Organics.*

EPA = U.S. Environmental Protection Agency

GW = groundwater

J = estimated value

MCL = Maximum Contaminant Level

µg/L = micrograms per liter

mg/L = milligrams per liter

NA = not analyzed

NE = not established

NMWQCC= New Mexico Water Quality Control Commission

pCi/L = picocuries per liter

RCRA = Resource Conservation and Recovery Act

RFI = RCRA Facility Investigation

U = not detected at the detection limit shown

VQ = validation qualifier

WQS = Water Quality Standard

Table 4-2b
Groundwater Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Unfiltered GW[a]	EPA MCL[b]	NMWQCC WQS[c]	Sample Number	OTC531B-GW-531B1-081412		OTC531B-GW-531B2-051513	
				Sample date	8/14/2012		5/15/2013	
				Location	MW-01		MW-01	
					Result	VQ	Result	VQ
TOTAL DISSOLVED SOLIDS (mg/L)	NE	NE	10,000		**17,100**		**17,100**	
VOLATILES (µg/L)								
1,1,1-TRICHLOROETHANE	NE	200	60		NA		0.20	U
1,1,2,2-TETRACHLOROETHANE	NE	NE	10		NA		0.24	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	NE	NE		NA		0.33	U
1,1,2-TRICHLOROETHANE	NE	5	10		NA		0.20	U
1,1-DICHLOROETHANE	NE	NE	25		NA		0.21	U
1,1-DICHLOROETHENE	NE	7	5		NA		0.20	U
1,2,4-TRICHLOROBENZENE	NE	70	NE		NA		0.50	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.20	NE		NA		0.71	U
1,2-DIBROMOETHANE	NE	0.05	0.10		NA		0.30	U
1,2-DICHLOROBENZENE	NE	600	NE		NA		0.22	U
1,2-DICHLOROETHANE	NE	5	10		NA		0.22	U
1,2-DICHLOROPROPANE	NE	5	NE		NA		0.26	U
1,3-DICHLOROBENZENE	NE	NE	NE		NA		0.25	U
1,4-DICHLOROBENZENE	NE	75	NE		NA		0.20	U
2-HEXANONE	NE	NE	NE		NA		2.0	U
ACETONE	NE	NE	NE		NA		10.0	U
BENZENE	NE	5	10		NA		0.21	U
BROMODICHLOROMETHANE	NE	80	NE		NA		0.20	U
BROMOFORM	NE	80	NE		NA		0.34	U
BROMOMETHANE	NE	NE	NE		NA		0.79	U
CARBON DISULFIDE	NE	NE	NE		NA		0.49	U
CARBON TETRACHLORIDE	NE	5	10		NA		0.31	U
CHLOROBENZENE	NE	100	NE		NA		0.20	U
CHLOROETHANE	NE	NE	NE		NA		0.50	U
CHLOROFORM	NE	80	100		NA		0.26	U

Table 4-2b
Groundwater Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531B-GW-531B1-081412		OTC531B-GW-531B2-051513	
			Sample date	8/14/2012		5/15/2013	
			Location	MW-01		MW-01	
	Background Values - Unfiltered GW[a]	**EPA MCL[b]**	**NMWQCC WQS[c]**	Result	VQ	Result	VQ
VOLATILES - continued (µg/L)							
CHLOROMETHANE	NE	NE	NE	NA		0.50	U
CIS-1,2-DICHLOROETHYLENE	NE	70	NE	NA		0.24	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	NA		0.22	U
CYCLOHEXANE	NE	NE	NE	NA		0.48	U
DIBROMOCHLOROMETHANE	NE	80	NE	NA		0.20	U
DICHLORODIFLUOROMETHANE	NE	NE	NE	NA		0.50	U
ETHYLBENZENE	NE	700	750	NA		0.29	U
ISOPROPYLBENZENE	NE	NE	NE	NA		0.20	U
METHYL ACETATE	NE	NE	NE	NA		5.00	U
METHYL ETHYL KETONE	NE	NE	NE	NA		3.10	U
METHYL ISOBUTYL KETONE	NE	NE	NE	NA		2.30	U
METHYLCYCLOHEXANE	NE	NE	NE	NA		0.20	U
METHYLENE CHLORIDE	NE	5	100	NA		2.00	U
STYRENE	NE	100	NE	NA		0.20	U
TERT-BUTYL METHYL ETHER	NE	NE	NE	NA		0.21	U
TETRACHLOROETHYLENE	NE	5	20	NA		0.32	U
TOLUENE	NE	1000	750	NA		0.20	U
TRANS-1,2-DICHLOROETHENE	NE	100	NE	NA		0.23	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	NA		0.21	U
TRICHLOROETHYLENE	NE	5	100	NA		0.31	U
TRICHLOROFLUOROMETHANE	NE	NE	NE	NA		0.50	U
VINYL CHLORIDE	NE	2	1	NA		0.44	U
XYLENES, TOTAL	NE	10000	620	NA		0.50	U

Table 4-2b
Groundwater Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531B-GW-531B1-081412		OTC531B-GW-531B2-051513	
			Sample date	8/14/2012		5/15/2013	
			Location	MW-01		MW-01	
	Background Values - Unfiltered GW[a]	**EPA MCL[b]**	**NMWQCC WQS[c]**	Result	VQ	Result	VQ
SEMIVOLATILES (µg/L)							
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	NA		0.75	U
2,4,5-TRICHLOROPHENOL	NE	NE	NE	NA		0.85	U
2,4,6-TRICHLOROPHENOL	NE	NE	NE	NA		0.74	U
2,4-DICHLOROPHENOL	NE	NE	NE	NA		0.67	U
2,4-DIMETHYLPHENOL	NE	NE	NE	NA		0.73	U
2,4-DINITROPHENOL	NE	NE	NE	NA		5.0	U
2,4-DINITROTOLUENE	NE	NE	NE	NA		0.65	U
2,6-DINITROTOLUENE	NE	NE	NE	NA		0.77	U
2-CHLORONAPHTHALENE	NE	NE	30	NA		0.69	U
2-CHLOROPHENOL	NE	NE	NE	NA		0.67	U
2-METHYLNAPHTHALENE	NE	NE	30	NA		0.66	U
2-METHYLPHENOL	NE	NE	NE	NA		0.69	U
2-NITROANILINE	NE	NE	NE	NA		0.72	U
2-NITROPHENOL	NE	NE	NE	NA		0.64	U
3,3'-DICHLOROBENZIDINE	NE	NE	NE	NA		0.70	U
3-NITROANILINE	NE	NE	NE	NA		0.62	U
4,6-DINITRO-2-METHYLPHENOL	NE	NE	NE	NA		1.4	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	NA		0.75	U
4-CHLORO-3-METHYLPHENOL	NE	NE	NE	NA		0.77	U
4-CHLOROANILINE	NE	NE	NE	NA		0.65	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	NA		0.83	U
4-NITROANILINE	NE	NE	NE	NA		0.92	U
4-NITROPHENOL	NE	NE	NE	NA		4.8	U
ACENAPHTHENE	NE	NE	30	NA		0.67	U
ACENAPHTHYLENE	NE	NE	30	NA		0.66	U
ACETOPHENONE	NE	NE	NE	NA		0.71	U
ANTHRACENE	NE	NE	30	NA		0.71	U

Table 4-2b
Groundwater Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531B-GW-531B1-081412		OTC531B-GW-531B2-051513	
			Sample date	8/14/2012		5/15/2013	
			Location	MW-01		MW-01	
	Background Values - Unfiltered GW[a]	EPA MCL[b]	NMWQCC WQS[c]	Result	VQ	Result	VQ
SEMIVOLATILES - continued (µg/L)							
ATRAZINE	NE	3	NE	NA		0.82	U
BENZALDEHYDE	NE	NE	NE	NA		4.8	U
BENZO(A)ANTHRACENE	NE	NE	30	NA		0.52	U
BENZO(A)PYRENE	NE	0.20	0.7	NA		0.54	U
BENZO(B)FLUORANTHENE	NE	NE	30	NA		0.72	U
BENZO(G,H,I)PERYLENE	NE	NE	30	NA		0.63	U
BENZO(K)FLUORANTHENE	NE	NE	30	NA		0.64	U
BENZYL BUTYL PHTHALATE	NE	NE	NE	NA		0.68	U
BIPHENYL	NE	NE	NE	NA		0.91	U
BIS(2-CHLOROETHOXY) METHANE	NE	NE	NE	NA		0.66	U
BIS(2-CHLOROETHYL) ETHER	NE	NE	NE	NA		0.68	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	6	NE	NA		1.1	U
CAPROLACTAM	NE	NE	NE	NA		2.4	U
CARBAZOLE	NE	NE	NE	NA		0.50	U
CHRYSENE	NE	NE	30	NA		0.56	U
DIBENZ(A,H)ANTHRACENE	NE	NE	30	NA		0.56	U
DIBENZOFURAN	NE	NE	NE	NA		0.71	U
DIETHYL PHTHALATE	NE	NE	NE	NA		0.95	U
DIMETHYL PHTHALATE	NE	NE	NE	NA		0.77	U
DI-N-BUTYL PHTHALATE	NE	NE	NE	NA		0.95	U
DI-N-OCTYLPHTHALATE	NE	NE	NE	NA		0.95	U
FLUORANTHENE	NE	NE	30	NA		0.56	U
FLUORENE	NE	NE	30	NA		0.73	U
HEXACHLOROBENZENE	NE	1	NE	NA		0.65	U
HEXACHLOROBUTADIENE	NE	NE	NE	NA		0.91	U
HEXACHLOROCYCLOPENTADIENE	NE	50	NE	NA		0.76	U
HEXACHLOROETHANE	NE	NE	NE	NA		0.71	U

Table 4-2b
Groundwater Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531B-GW-531B1-081412		OTC531B-GW-531B2-051513	
			Sample date	8/14/2012		5/15/2013	
			Location	MW-01		MW-01	
	Background Values - Unfiltered GW[a]	**EPA MCL[b]**	**NMWQCC WQS[c]**	Result	VQ	Result	VQ
SEMIVOLATILES - continued (µg/L)							
INDENO(1,2,3-C,D)PYRENE	NE	NE	30	NA		0.55	U
ISOPHORONE	NE	NE	NE	NA		0.61	U
M,P-CRESOL	NE	NE	NE	NA		1.3	U
NAPHTHALENE	NE	NE	30	NA		0.61	U
NITROBENZENE	NE	NE	NE	NA		0.69	U
N-NITROSODI-N-PROPYLAMINE	NE	NE	NE	NA		0.81	U
N-NITROSODIPHENYLAMINE	NE	NE	NE	NA		0.95	U
PENTACHLOROPHENOL	NE	1	NE	NA		4.8	U
PHENANTHRENE	NE	NE	30	NA		0.67	U
PHENOL	NE	NE	NE	NA		0.52	U
PYRENE	NE	NE	30	NA		0.65	U
EXPLOSIVES (µg/L)							
1,3,5-TRINITROBENZENE	NE	NE	NE	NA		0.079	U
1,3-DINITROBENZENE	NE	NE	NE	NA		0.079	U
2,4,6-TRINITROTOLUENE	NE	NE	NE	NA		0.079	U
2,4-DINITROTOLUENE	NE	NE	NE	NA		0.079	U
2,6-DINITROTOLUENE	NE	NE	NE	NA		0.079	U
2-AMINO-4,6-DINITROTOLUENE	NE	NE	NE	NA		0.079	U
2-NITROTOLUENE	NE	NE	NE	NA		0.079	U
3-NITROTOLUENE	NE	NE	NE	NA		0.079	U
4-AMINO-2,6-DINITROTOLUENE	NE	NE	NE	NA		0.079	U
4-NITROTOLUENE	NE	NE	NE	NA		0.079	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	NE	NE	NA		0.079	U
NITROBENZENE	NE	NE	NE	NA		0.079	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	NE	NE	NA		0.079	U
TETRYL	NE	NE	NE	NA		0.079	U

Table 4-2b
Groundwater Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531B-GW-531B1-081412		OTC531B-GW-531B2-051513	
			Sample date	8/14/2012		5/15/2013	
			Location	MW-01		MW-01	
	Background Values - Unfiltered GW[a]	**EPA MCL[b]**	**NMWQCC WQS[c]**	Result	VQ	Result	VQ
METALS (µg/L)							
ALUMINUM	1043	NE	NE	NA		75	U
ANTIMONY	6	6	NE	NA		6.5	U
ARSENIC	10	10	100	NA		13.0	U
BARIUM	38	2000	1000	NA		12.3	J
BERYLLIUM	4	4	NE	NA		2.5	U
CADMIUM	5	5	10	NA		2.5	U
CALCIUM	1,136,664	NE	NE	NA		741,000	
CHROMIUM, TOTAL	12	100	50	NA		10.0	U
COBALT	36	NE	NE	NA		2.5	U
COPPER	9.8	1300	1000	NA		8.7	J
IRON	300	NE	1000	NA		150	U
LEAD	9	15	50	NA		5.5	U
MAGNESIUM	3,692,782	NE	NE	NA		1,270,000	
MANGANESE	50	NE	200	NA		511	
MERCURY	0.5	2	2	NA		0.03	U
NICKEL	22	NE	NE	NA		16.4	J
POTASSIUM	212,144	NE	NE	NA		75,300	J
SELENIUM	50	50	50	NA		10.0	U
SILVER	10	NE	50	NA		2.5	U
SODIUM	20,989,580	NE	NE	NA		3,700,000	
THALLIUM	2	2	NE	NA		2.4	J
VANADIUM	90	NE	NE	NA		10.7	J
ZINC	17	NE	10000	NA		25	U

Table 4-2b
Groundwater Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531B-GW-531B1-081412		OTC531B-GW-531B2-051513	
			Sample date	8/14/2012		5/15/2013	
			Location	MW-01		MW-01	
	Background Values - Unfiltered GW[a]	**EPA MCL[b]**	**NMWQCC WQS[c]**	Result	VQ	Result	VQ
PCBs (µg/L)							
PCB-1016 (AROCHLOR 1016)	NE	NE	1	NA		0.19	U
PCB-1221 (AROCHLOR 1221)	NE	NE	1	NA		0.24	U
PCB-1232 (AROCHLOR 1232)	NE	NE	1	NA		0.24	U
PCB-1242 (AROCHLOR 1242)	NE	NE	1	NA		0.19	U
PCB-1248 (AROCHLOR 1248)	NE	NE	1	NA		0.19	U
PCB-1254 (AROCHLOR 1254)	NE	NE	1	NA		0.19	U
PCB-1260 (AROCHLOR 1260)	NE	NE	1	NA		0.19	U
PETROLEUM HYDROCARBONS (µg/L)							
GASOLINE RANGE ORGANICS C6-C10	NE	NE	See individual VOC & SVOC			50	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	400	NA		188	J
OIL RANGE ORGANICS C28-C40	NE	NE	200	NA		95	U
CYANIDE (µg/L)							
CYANIDE	NE	200	200	NA		3	U
TRITIUM (pCi/L)							
TRITIUM	NE	NE	NE	NA		503	U

Table 4-2b
Groundwater Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NM WQCC Water Quality Standard

Value exceeds EPA Maximum Contaminant Level

Bold = parameter detected

[a] *New Mexico Environment Department (NMED), 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," letter to D. Scruggs, Chief, Environmental Restoration Program, Holloman Air Force Base from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, New Mexico Environment Department, March 1.*

[b] *U.S. Environmental Protection Agency (EPA), 2012, National Primary Drinking Water Regulations: List of Drinking Water Contaminants and Maximum Contaminant Levels.*

[c] *New Mexico Water Quality Control Commission, Water Quality Standards, 20.6.2 New Mexico Administrative Code.*

[d] *New Mexico Environment Department (NMED), 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, New Mexico Environment Department, Santa Fe, New Mexico, February, Table 6-2. TPH Screening Guidelines for Potable Groundwater (GW-1), February 2012, Table A-1: NMED Soil Screening Levels, updated June 2012. "Unknown oil" criteria used for Oil Range Organics.*

EPA = U.S. Environmental Protection Agency

GW = groundwater

J = estimated value

MCL = Maximum Contaminant Level

µg/L = micrograms per liter

mg/L = milligrams per liter

NA = not analyzed

NE = not established

NMWQCC= New Mexico Water Quality Control Commission

pCi/L = picocuries per liter

RFI = RCRA Facility Investigation

RCRA = Resource Conservation and Recovery Act

U = not detected at the detection limit shown

VQ = validation qualifier

WQS = Water Quality Standard

Table 4-2c
Groundwater Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531C-GW-531C1-081412	
			Sample date	8/14/2012	
			Location	MW-01	
	Background Values - Unfiltered GW[a]	**EPA MCL[b]**	**NMWQCC WQS[c]**	Result	VQ
TOTAL DISSOLVED SOLIDS (mg/L)	NE	NE	10,000	**8900**	
VOLATILES (µg/L)					
1,1,1-TRICHLOROETHANE	NE	200	60	0.2	U
1,1,2,2-TETRACHLOROETHANE	NE	NE	10	0.23	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	NE	NE	0.47	U
1,1,2-TRICHLOROETHANE	NE	5	10	0.22	U
1,1-DICHLOROETHANE	NE	NE	25	0.25	U
1,1-DICHLOROETHENE	NE	7	5	0.23	U
1,2,4-TRICHLOROBENZENE	NE	70	NE	0.5	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.20	NE	0.5	U
1,2-DIBROMOETHANE	NE	0.05	0.10	0.37	U
1,2-DICHLOROBENZENE	NE	600	NE	0.25	U
1,2-DICHLOROETHANE	NE	5	10	0.2	U
1,2-DICHLOROPROPANE	NE	5	NE	0.25	U
1,3-DICHLOROBENZENE	NE	NE	NE	0.2	U
1,4-DICHLOROBENZENE	NE	75	NE	0.23	U
2-HEXANONE	NE	NE	NE	4	UJ
ACETONE	NE	NE	NE	10	UJ
BENZENE	NE	5	10	0.2	U
BROMODICHLOROMETHANE	NE	80	NE	0.2	U
BROMOFORM	NE	80	NE	0.2	U
BROMOMETHANE	NE	NE	NE	0.5	U
CARBON DISULFIDE	NE	NE	NE	0.5	U
CARBON TETRACHLORIDE	NE	5	10	0.25	U
CHLOROBENZENE	NE	100	NE	0.2	U
CHLOROETHANE	NE	NE	NE	0.5	U
CHLOROFORM	NE	80	100	**2.3**	

Table 4-2c
Groundwater Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531C-GW-531C1-081412	
			Sample date	8/14/2012	
			Location	MW-01	
	Background Values - Unfiltered GW[a]	**EPA MCL[b]**	**NMWQCC WQS[c]**	Result	VQ
VOLATILES - continued (µg/L)					
CHLOROMETHANE	NE	NE	NE	0.5	UJ
CIS-1,2-DICHLOROETHYLENE	NE	70	NE	0.26	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	0.2	U
CYCLOHEXANE	NE	NE	NE	0.31	U
DIBROMOCHLOROMETHANE	NE	80	NE	0.2	U
DICHLORODIFLUOROMETHANE	NE	NE	NE	0.5	UJ
ETHYLBENZENE	NE	700	750	0.2	U
ISOPROPYLBENZENE	NE	NE	NE	0.2	U
METHYL ACETATE	NE	NE	NE	5	U
METHYL ETHYL KETONE	NE	NE	NE	2	UJ
METHYL ISOBUTYL KETONE	NE	NE	NE	2	UJ
METHYLCYCLOHEXANE	NE	NE	NE	0.38	U
METHYLENE CHLORIDE	NE	5	100	2	U
STYRENE	NE	100	NE	0.2	U
TERT-BUTYL METHYL ETHER	NE	NE	NE	0.34	U
TETRACHLOROETHYLENE	NE	5	20	0.25	U
TOLUENE	NE	1000	750	0.2	U
TRANS-1,2-DICHLOROETHENE	NE	100	NE	0.35	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.2	U
TRICHLOROETHYLENE	NE	5	100	0.26	U
TRICHLOROFLUOROMETHANE	NE	NE	NE	0.5	UJ
VINYL CHLORIDE	NE	2	1	0.22	U
XYLENES, TOTAL	NE	10000	620	0.52	U

Table 4-2c
Groundwater Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531C-GW-531C1-081412	
			Sample date	8/14/2012	
			Location	MW-01	
	Background Values - Unfiltered GW[a]	**EPA MCL[b]**	**NMWQCC WQS[c]**	Result	VQ
SEMIVOLATILES (µg/L)					
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	0.52	U
2,4,5-TRICHLOROPHENOL	NE	NE	NE	0.48	U
2,4,6-TRICHLOROPHENOL	NE	NE	NE	0.48	U
2,4-DICHLOROPHENOL	NE	NE	NE	0.48	U
2,4-DIMETHYLPHENOL	NE	NE	NE	1.1	U
2,4-DINITROPHENOL	NE	NE	NE	9.6	U
2,4-DINITROTOLUENE	NE	NE	NE	0.48	U
2,6-DINITROTOLUENE	NE	NE	NE	0.48	U
2-CHLORONAPHTHALENE	NE	NE	30	0.48	U
2-CHLOROPHENOL	NE	NE	NE	0.48	U
2-METHYLNAPHTHALENE	NE	NE	30	0.55	U
2-METHYLPHENOL	NE	NE	NE	0.52	U
2-NITROANILINE	NE	NE	NE	0.48	U
2-NITROPHENOL	NE	NE	NE	0.52	U
3,3'-DICHLOROBENZIDINE	NE	NE	NE	0.96	U
3-NITROANILINE	NE	NE	NE	0.48	U
4,6-DINITRO-2-METHYLPHENOL	NE	NE	NE	1.9	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.48	U
4-CHLORO-3-METHYLPHENOL	NE	NE	NE	0.48	U
4-CHLOROANILINE	NE	NE	NE	0.48	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.48	U
4-NITROANILINE	NE	NE	NE	0.48	U
4-NITROPHENOL	NE	NE	NE	4.8	U
ACENAPHTHENE	NE	NE	30	0.48	U
ACENAPHTHYLENE	NE	NE	30	0.48	U
ACETOPHENONE	NE	NE	NE	0.49	U
ANTHRACENE	NE	NE	30	0.48	U

Table 4-2c
Groundwater Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531C-GW-531C1-081412	
			Sample date	8/14/2012	
			Location	MW-01	
	Background Values - Unfiltered GW[a]	**EPA MCL[b]**	**NMWQCC WQS[c]**	Result	VQ
SEMIVOLATILES - continued (µg/L)					
ATRAZINE	NE	3	NE	0.65	U
BENZALDEHYDE	NE	NE	NE	4.8	UJ
BENZO(A)ANTHRACENE	NE	NE	30	0.48	U
BENZO(A)PYRENE	NE	0.20	0.7	0.48	U
BENZO(B)FLUORANTHENE	NE	NE	30	0.48	U
BENZO(G,H,I)PERYLENE	NE	NE	30	0.48	U
BENZO(K)FLUORANTHENE	NE	NE	30	0.48	U
BENZYL BUTYL PHTHALATE	NE	NE	NE	1.1	U
BIPHENYL	NE	NE	NE	0.48	U
BIS(2-CHLOROETHOXY) METHANE	NE	NE	NE	0.48	U
BIS(2-CHLOROETHYL) ETHER	NE	NE	NE	0.52	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	6	NE	1.1	U
CAPROLACTAM	NE	NE	NE	3.8	U
CARBAZOLE	NE	NE	NE	0.48	U
CHRYSENE	NE	NE	30	0.48	U
DIBENZ(A,H)ANTHRACENE	NE	NE	30	0.5	U
DIBENZOFURAN	NE	NE	NE	0.48	U
DIETHYL PHTHALATE	NE	NE	NE	1.1	U
DIMETHYL PHTHALATE	NE	NE	NE	0.95	U
DI-N-BUTYL PHTHALATE	NE	NE	NE	0.84	U
DI-N-OCTYLPHTHALATE	NE	NE	NE	1.1	U
FLUORANTHENE	NE	NE	30	0.48	U
FLUORENE	NE	NE	30	0.48	U
HEXACHLOROBENZENE	NE	1	NE	0.54	U
HEXACHLOROBUTADIENE	NE	NE	NE	0.96	U
HEXACHLOROCYCLOPENTADIENE	NE	50	NE	1.8	U
HEXACHLOROETHANE	NE	NE	NE	0.96	U

Table 4-2c
Groundwater Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531C-GW-531C1-081412	
			Sample date	8/14/2012	
			Location	MW-01	
	Background Values - Unfiltered GW[a]	**EPA MCL[b]**	**NMWQCC WQS[c]**	Result	VQ
SEMIVOLATILES - continued (µg/L)					
INDENO(1,2,3-C,D)PYRENE	NE	NE	30	0.48	U
ISOPHORONE	NE	NE	NE	0.48	U
M,P-CRESOL	NE	NE	NE	1.1	U
NAPHTHALENE	NE	NE	30	0.77	U
NITROBENZENE	NE	NE	NE	0.57	U
N-NITROSODI-N-PROPYLAMINE	NE	NE	NE	0.48	U
N-NITROSODIPHENYLAMINE	NE	NE	NE	0.96	U
PENTACHLOROPHENOL	NE	1	NE	5.2	U
PHENANTHRENE	NE	NE	30	0.48	U
PHENOL	NE	NE	NE	0.48	U
PYRENE	NE	NE	30	0.48	U
EXPLOSIVES (µg/L)					
1,3,5-TRINITROBENZENE	NE	NE	NE	0.076	U
1,3-DINITROBENZENE	NE	NE	NE	0.092	U
2,4,6-TRINITROTOLUENE	NE	NE	NE	0.076	U
2,4-DINITROTOLUENE	NE	NE	NE	0.076	U
2,6-DINITROTOLUENE	NE	NE	NE	0.076	U
2-AMINO-4,6-DINITROTOLUENE	NE	NE	NE	0.076	U
2-NITROTOLUENE	NE	NE	NE	0.076	U
3-NITROTOLUENE	NE	NE	NE	0.076	U
4-AMINO-2,6-DINITROTOLUENE	NE	NE	NE	0.078	U
4-NITROTOLUENE	NE	NE	NE	0.076	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	NE	NE	0.076	U
NITROBENZENE	NE	NE	NE	0.08	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	NE	NE	0.076	U
TETRYL	NE	NE	NE	0.076	U

Table 4-2c
Groundwater Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531C-GW-531C1-081412	
			Sample date	8/14/2012	
			Location	MW-01	
	Background Values - Unfiltered GW[a]	**EPA MCL[b]**	**NMWQCC WQS[c]**	Result	VQ
METALS (µg/L)					
ALUMINUM	1043	NE	NE	**553**	
ANTIMONY	6	6	NE	50	U
ARSENIC	10	10	100	**4.9**	J
BARIUM	38	2000	1000	**24**	J
BERYLLIUM	4	4	NE	1	U
CADMIUM	5	5	10	25	U
CALCIUM	1,136,664	NE	NE	**803,000**	
CHROMIUM, TOTAL	12	100	50	25	U
COBALT	36	NE	NE	1	U
COPPER	9.8	1300	1000	**2.4**	J
IRON	300	NE	1000	**466**	
LEAD	9	15	50	25	U
MAGNESIUM	3,692,782	NE	NE	**445,000**	
MANGANESE	50	NE	200	**48**	
MERCURY	0.5	2	2	0.05	U
NICKEL	22	NE	NE	2	U
POTASSIUM	212,144	NE	NE	**42000**	
SELENIUM	50	50	50	50	U
SILVER	10	NE	50	1	U
SODIUM	20,989,580	NE	NE	**1,540,000**	
THALLIUM	2	2	NE	46	U
VANADIUM	90	NE	NE	**19.8**	J
ZINC	17	NE	10000	130	U

Table 4-2c
Groundwater Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531C-GW-531C1-081412	
			Sample date	8/14/2012	
			Location	MW-01	
	Background Values - Unfiltered GW[a]	**EPA MCL[b]**	**NMWQCC WQS[c]**	Result	VQ
PCBs (µg/L)					
PCB-1016 (AROCHLOR 1016)	NE	NE	1	0.19	U
PCB-1221 (AROCHLOR 1221)	NE	NE	1	0.24	U
PCB-1232 (AROCHLOR 1232)	NE	NE	1	0.24	U
PCB-1242 (AROCHLOR 1242)	NE	NE	1	0.19	U
PCB-1248 (AROCHLOR 1248)	NE	NE	1	0.19	U
PCB-1254 (AROCHLOR 1254)	NE	NE	1	0.19	U
PCB-1260 (AROCHLOR 1260)	NE	NE	1	0.19	U
PETROLEUM HYDROCARBONS (µg/L)					
GASOLINE RANGE ORGANICS C6-C10	NE	NE	See individual VOC & SVOC	50	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	400	96	U
OIL RANGE ORGANICS C28-C40	NE	NE	200	96	U
CYANIDE (µg/L)					
CYANIDE	NE	200	200	5	U
TRITIUM (pCi/L)					
TRITIUM	NE	NE	NE	307	U

Table 4-2c
Groundwater Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NM WQCC Water Quality Standard

Value exceeds EPA Maximum Contaminant Level

Bold = parameter detected

[a] *New Mexico Environment Department (NMED), 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," letter to D. Scruggs, Chief, Environmental Restoration Program, Holloman Air Force Base from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, New Mexico Environment Department, March 1.*

[b] *U.S. Environmental Protection Agency (EPA), 2012, National Primary Drinking Water Regulations: List of Drinking Water Contaminants and Maximum Contaminant Levels.*

[c] *New Mexico Water Quality Control Commission, Water Quality Standards, 20.6.2 New Mexico Administrative Code.*

[d] *New Mexico Environment Department (NMED), 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, New Mexico Environment Department, Santa Fe, New Mexico, February, Table 6-2. TPH Screening Guidelines for Potable Groundwater (GW-1), February 2012, Table A-1: NMED Soil Screening Levels, updated June 2012. "Unknown oil" criteria used for Oil Range Organics.*

EPA = U.S. Environmental Protection Agency

GW = groundwater

J = estimated value

MCL = Maximum Contaminant Level

µg/L = micrograms per liter

mg/L = milligrams per liter

NA = not analyzed

NE = not established

NM WQCC= New Mexico Water Quality Control Commission

PCB = polychlorinatedbiphenyl

pCi/L = picocuries per liter

RCRA = Resource Conservation and Recovery Act

RFI = RCRA Facility Investigation

U = not detected at the detection limit shown

VQ = validation qualifier

WQS = Water Quality Standard

Table 4-3
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	LDY-IDW01-090412	
		Sample Date	9/4/2012	
		Sample Type	Waste Characterization	
		40 CFR 261 Waste Characteristic Criteria	Result	Lab Qual
General Chemistry				
Corrosivity as pH	pH Units	> 2 and < 12.5	**7.7**	
Cyanide Reactivity	mg/kg	< 250	1.5	U
Ignitability (Flashpoint)	°F	> 140 °F	>200	
Solids, Percent	%	NA	**84.4**	
Sulfide Reactivity	mg/kg	< 500	59	U
TCLP Volatiles				
Benzene	mg/L	0.5	0.0020	U
Chlorobenzene	mg/L	100	0.0020	U
Chloroform	mg/L	6	0.0022	U
Carbon tetrachloride	mg/L	0.5	0.0025	U
1,1-Dichloroethylene	mg/L	0.7	0.0023	U
1,2-Dichloroethane	mg/L	0.5	0.0020	U
p-Dichlorobenzene	mg/L	7.5	0.0023	U
Methyl ethyl ketone	mg/L	200	0.020	U
Tetrachloroethylene	mg/L	0.7	0.0025	U
Trichloroethylene	mg/L	0.5	0.0026	U
Vinyl chloride	mg/L	0.2	0.0022	U
TCLP Semivolatiles				
2-Methylphenol	mg/L	200	0.0054	U
3&4-Methylphenol	mg/L	200	0.011	U
Pentachlorophenol	mg/L	100	0.054	U
2,4,5-Trichlorophenol	mg/L	400	0.0050	U
2,4,6-Trichlorophenol	mg/L	2	0.0050	U
1,4-Dichlorobenzene	mg/L	7.5	0.0100	U
2,4-Dinitrotoluene	mg/L	0.13	0.0050	U
Hexachlorobenzene	mg/L	0.13	0.0056	U
Hexachlorobutadiene	mg/L	0.5	0.0100	U
Hexachloroethane	mg/L	3	0.010	U
Nitrobenzene	mg/L	2	0.0059	U
Pyridine	mg/L	100	0.016	U
TCLP Metals				
Arsenic	mg/L	5	0.020	U
Barium	mg/L	100	**0.12**	J
Cadmium	mg/L	1	0.010	U
Chromium	mg/L	5	0.010	U
Lead	mg/L	5	0.010	U
Mercury	mg/L	0.2	0.00050	U
Selenium	mg/L	1	0.020	U
Silver	mg/L	5	0.010	U

Table 4-3
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

°F = degrees Fahrenheit
> = greater than
< = less than
% = percent
CFR = Code of Federal Regulations
J = estimated value
Lab Qual = laboratory qualifier
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
NA = not applicable
TCLP = Toxicity Characteristic Leaching Procedure
U = not detected at the detection limit shown

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles				
Acetone	µg/L	NE	10	U
Benzene	µg/L	5	0.21	U
Bromodichloromethane	µg/L	80	0.20	U
Bromoform	µg/L	80	0.34	U
Chlorobenzene	µg/L	100	0.20	U
Chloroethane	µg/L	NE	0.50	U
Chloroform	µg/L	80	0.26	U
Carbon disulfide	µg/L	NE	0.49	U
Carbon tetrachloride	µg/L	5	0.31	U
Cyclohexane	µg/L	NE	0.48	U
1,1-Dichloroethane	µg/L	NE	0.21	U
1,1-Dichloroethylene	µg/L	7	0.20	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.71	U
1,2-Dibromoethane	µg/L	0.05	0.30	U
1,2-Dichloroethane	µg/L	5	0.22	U
1,2-Dichloropropane	µg/L	5	0.26	U
Dibromochloromethane	µg/L	80	0.20	U
Dichlorodifluoromethane	µg/L	NE	0.50	U
cis-1,2-Dichloroethylene	µg/L	70	**0.42**	J
cis-1,3-Dichloropropene	µg/L	NE	0.22	U
m-Dichlorobenzene	µg/L	NE	0.25	U
o-Dichlorobenzene	µg/L	600	0.22	U
p-Dichlorobenzene	µg/L	75	0.20	U
trans-1,2-Dichloroethylene	µg/L	100	0.23	U
trans-1,3-Dichloropropene	µg/L	NE	0.21	U
Ethylbenzene	µg/L	700	0.29	U
Freon 113	µg/L	NE	0.33	U
2-Hexanone	µg/L	NE	2.0	U
Isopropylbenzene	µg/L	NE	0.20	U
4-Methyl-2-pentanone	µg/L	NE	2.3	U
Methyl Acetate	µg/L	NE	5.0	U
Methyl bromide	µg/L	NE	0.79	U
Methyl chloride	µg/L	NE	0.50	U
Methylcyclohexane	µg/L	NE	0.20	U
Methylene chloride	µg/L	5	2.0	U
Methyl ethyl ketone	µg/L	NE	3.1	U
Methyl Tert Butyl Ether	µg/L	NE	0.21	U
Styrene	µg/L	100	0.20	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles (continued)				
1,1,1-Trichloroethane	µg/L	200	0.20	U
1,1,2,2-Tetrachloroethane	µg/L	NE	0.24	U
1,1,2-Trichloroethane	µg/L	5	0.20	U
1,2,4-Trichlorobenzene	µg/L	70	0.50	U
Tetrachloroethylene	µg/L	5	0.32	U
Toluene	µg/L	1000	0.20	U
Trichloroethylene	µg/L	5	0.31	U
Trichlorofluoromethane	µg/L	NE	0.50	U
Vinyl chloride	µg/L	2	0.44	U
Xylene (total)	µg/L	10000	0.50	U
Semivolatiles				
2-Chlorophenol	µg/L	NE	0.68	U
4-Chloro-3-methyl phenol	µg/L	NE	0.78	U
2,4-Dichlorophenol	µg/L	NE	0.67	U
2,4-Dimethylphenol	µg/L	NE	0.74	U
2,4-Dinitrophenol	µg/L	NE	5.0	U
4,6-Dinitro-o-cresol	µg/L	NE	1.4	U
2-Methylphenol	µg/L	NE	0.69	U
3&4-Methylphenol	µg/L	NE	1.3	U
2-Nitrophenol	µg/L	NE	0.65	U
4-Nitrophenol	µg/L	NE	4.8	U
Pentachlorophenol	µg/L	1	4.8	U
Phenol	µg/L	NE	0.53	U
2,4,5-Trichlorophenol	µg/L	NE	0.86	U
2,4,6-Trichlorophenol	µg/L	NE	0.75	U
Acenaphthene	µg/L	NE	0.67	U
Acenaphthylene	µg/L	NE	0.67	U
Acetophenone	µg/L	NE	0.72	U
Anthracene	µg/L	NE	0.72	U
Atrazine	µg/L	3	0.83	U
Benzaldehyde	µg/L	NE	4.8	U
Benzo(a)anthracene	µg/L	NE	0.52	U
Benzo(a)pyrene	µg/L	0.2	0.55	U
Benzo(b)fluoranthene	µg/L	NE	0.73	U
Benzo(g,h,i)perylene	µg/L	NE	0.64	U
Benzo(k)fluoranthene	µg/L	NE	0.64	U
4-Bromophenyl phenyl ether	µg/L	NE	0.76	U
Butyl benzyl phthalate	µg/L	NE	0.68	U
1,1'-Biphenyl	µg/L	NE	0.92	U
2-Chloronaphthalene	µg/L	NE	0.70	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Semivolatiles (continued)				
4-Chloroaniline	µg/L	NE	0.66	U
Caprolactam	µg/L	NE	2.4	U
Carbazole	µg/L	NE	0.50	U
Chrysene	µg/L	NE	0.56	U
bis(2-Chloroethoxy)methane	µg/L	NE	0.67	U
bis(2-Chloroethyl)ether	µg/L	NE	0.69	U
bis(2-Chloroisopropyl)ether	µg/L	NE	0.76	U
4-Chlorophenyl phenyl ether	µg/L	NE	0.84	U
2,4-Dinitrotoluene	µg/L	NE	0.66	U
2,6-Dinitrotoluene	µg/L	NE	0.77	U
3,3'-Dichlorobenzidine	µg/L	NE	0.71	U
Dibenzo(a,h)anthracene	µg/L	NE	0.56	U
Dibenzofuran	µg/L	NE	0.72	U
Di-n-butyl phthalate	µg/L	NE	0.96	U
Di-n-octyl phthalate	µg/L	NE	0.96	U
Diethyl phthalate	µg/L	NE	0.96	U
Dimethyl phthalate	µg/L	NE	0.77	U
bis(2-Ethylhexyl)phthalate	µg/L	6	1.1	U
Fluoranthene	µg/L	NE	0.56	U
Fluorene	µg/L	NE	0.73	U
Hexachlorobenzene	µg/L	1	0.66	U
Hexachlorobutadiene	µg/L	NE	0.92	U
Hexachlorocyclopentadiene	µg/L	50	0.76	U
Hexachloroethane	µg/L	NE	0.71	U
Indeno(1,2,3-cd)pyrene	µg/L	NE	0.55	U
Isophorone	µg/L	NE	0.61	U
2-Methylnaphthalene	µg/L	NE	0.66	U
2-Nitroaniline	µg/L	NE	0.72	U
3-Nitroaniline	µg/L	NE	0.62	U
4-Nitroaniline	µg/L	NE	0.93	U
Naphthalene	µg/L	NE	0.61	U
Nitrobenzene	µg/L	NE	0.69	U
N-Nitroso-di-n-propylamine	µg/L	NE	0.82	U
N-Nitrosodiphenylamine	µg/L	NE	0.96	U
Phenanthrene	µg/L	NE	0.68	U
Pyrene	µg/L	NE	0.65	U
Petroleum Hydrocarbons				
Gasoline Range Organics (C6-C10)	mg/L	NE	0.05	U
Diesel Range Organics (C10-C28)	mg/L	NE	**0.115**	J
Oil Range Organics (C28-C40)	mg/L	NE	0.10	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Metals				
Aluminum	µg/L	NE	**36.2**	J
Antimony	µg/L	6	**6.7**	J
Arsenic	µg/L	10	2.5	U
Barium	µg/L	2000	**29.1**	J
Beryllium	µg/L	4	0.50	U
Cadmium	µg/L	5	1.0	U
Calcium	µg/L	NE	**654,000**	
Chromium	µg/L	100	4	U
Cobalt	µg/L	NE	**6.2**	J
Copper	µg/L	1300	**2.9**	J
Iron	µg/L	NE	**97.5**	J
Lead	µg/L	15	2.2	U
Magnesium	µg/L	NE	**310,000**	
Manganese	µg/L	NE	**179**	
Mercury	µg/L	2	0.03	U
Nickel	µg/L	NE	**3.7**	J
Potassium	µg/L	NE	**16,500**	
Selenium	µg/L	50	4.0	U
Silver	µg/L	NE	0.50	U
Sodium	µg/L	NE	**762,000**	
Thallium	µg/L	2	0.078	U
Vanadium	µg/L	NE	**4.5**	J
Zinc	µg/L	NE	**12.8**	J

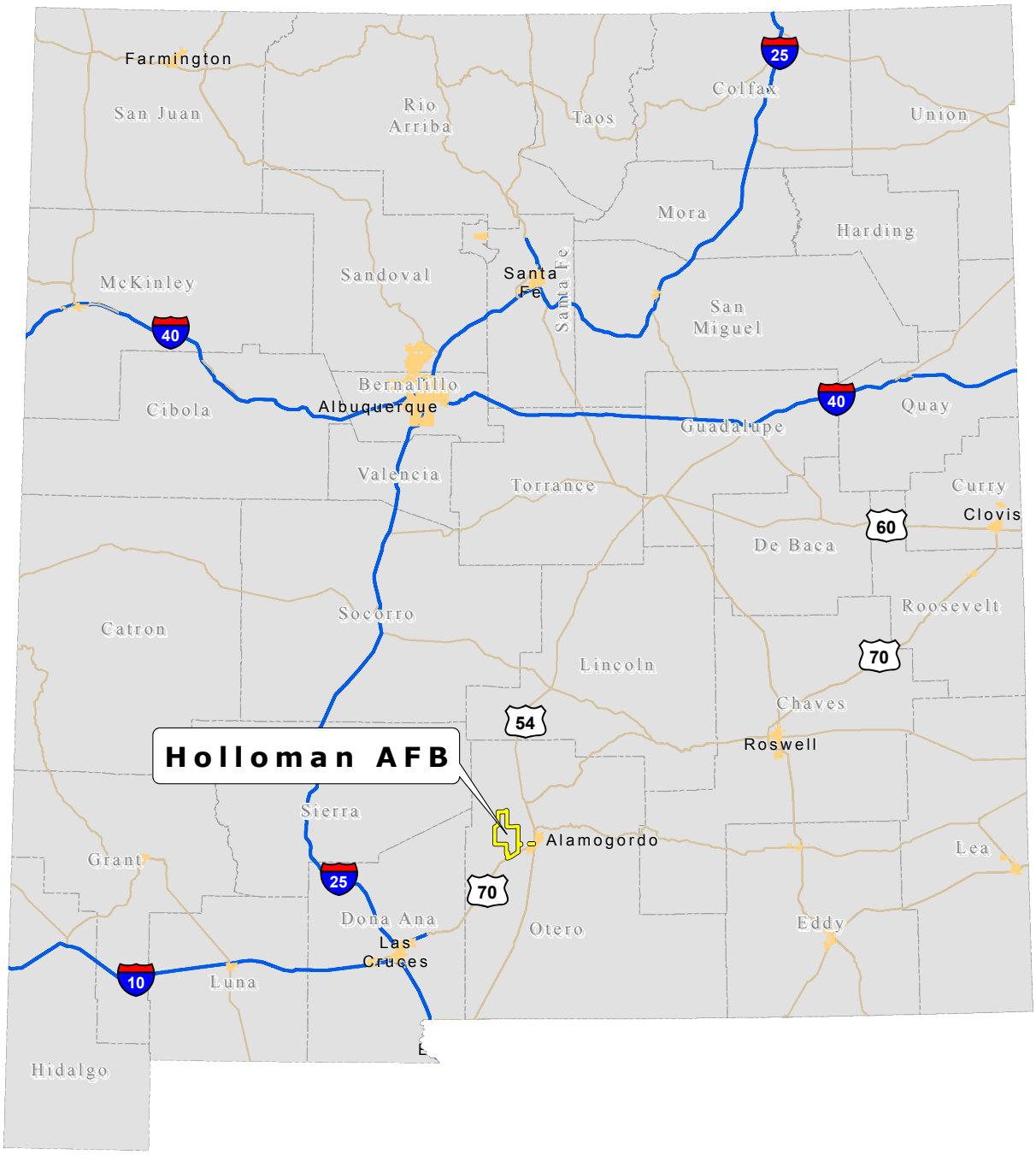
Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

[a] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

EPA = U.S. Environmental Protection Agency.
J = estimated value.
MCL = maximum contaminant level.
µg/L = micrograms per liter.
mg/L = milligrams per liter.
NE = not established
RSL = regional screening level.
U = not detected at the detection limit shown.
VQ = validation qualifier.

Figures



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Date: 8/28/2013

Approved By: BFoss

Checked By: CLong

Drawn By: BGrod

Office: Hou

Legend

Holloman AFB

N

WGS 84 UTM Zone 13N Meters

0 20 40 80
Kilometers

0 10 20 40
Miles

Figure 1-1

Holloman Air Force Base Location

Holloman AFB, New Mexico

Office	Drawn By	Checked By	Approved By	Date	File Path
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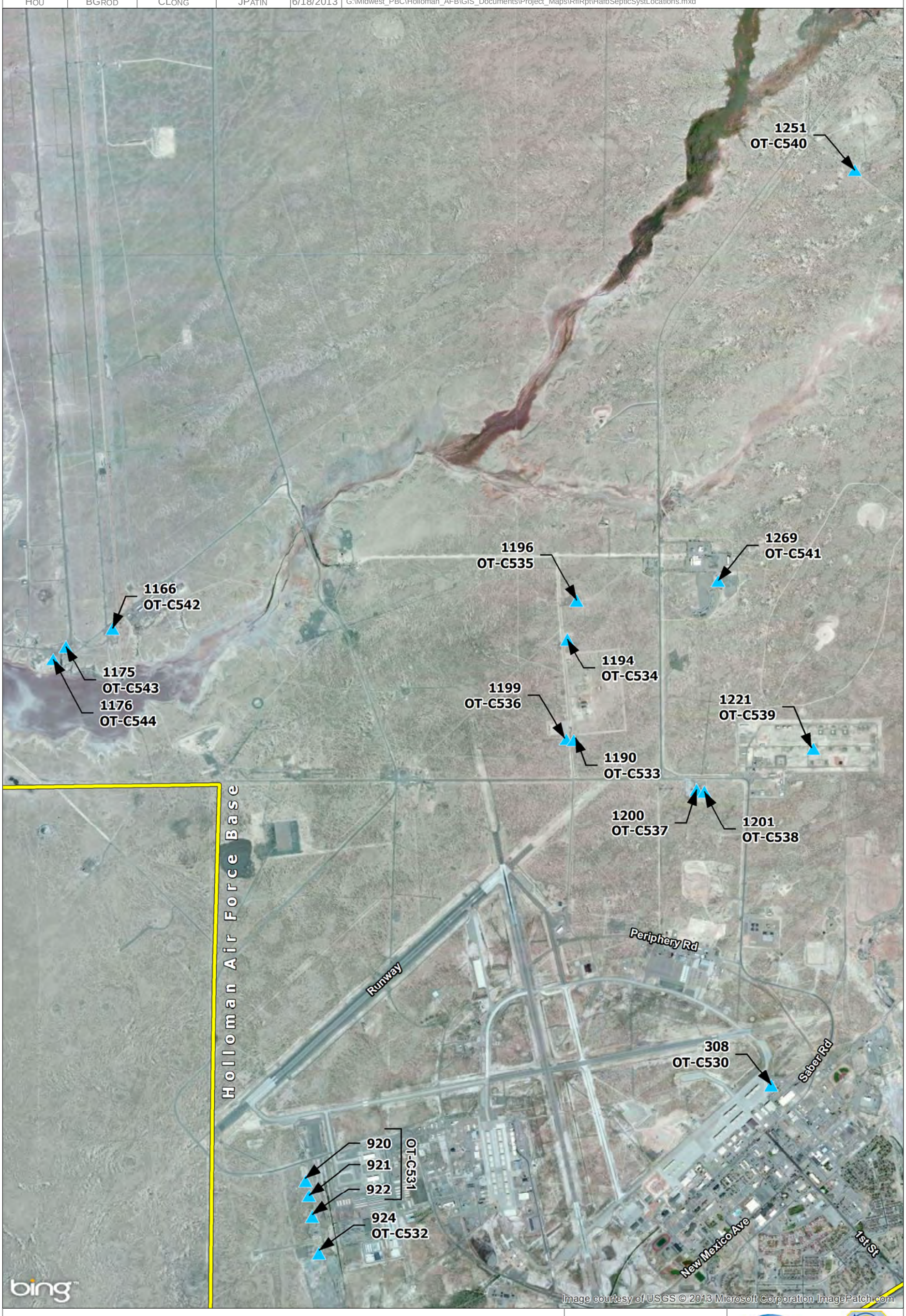


LEGEND

- Holloman AFB
- Septic Tank System

N

WGS 84 UTM Zone 13N
Meters

1 inch = 2,800 feet

0 700 1,400 2,800
Feet

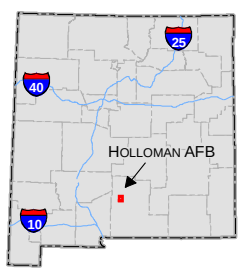
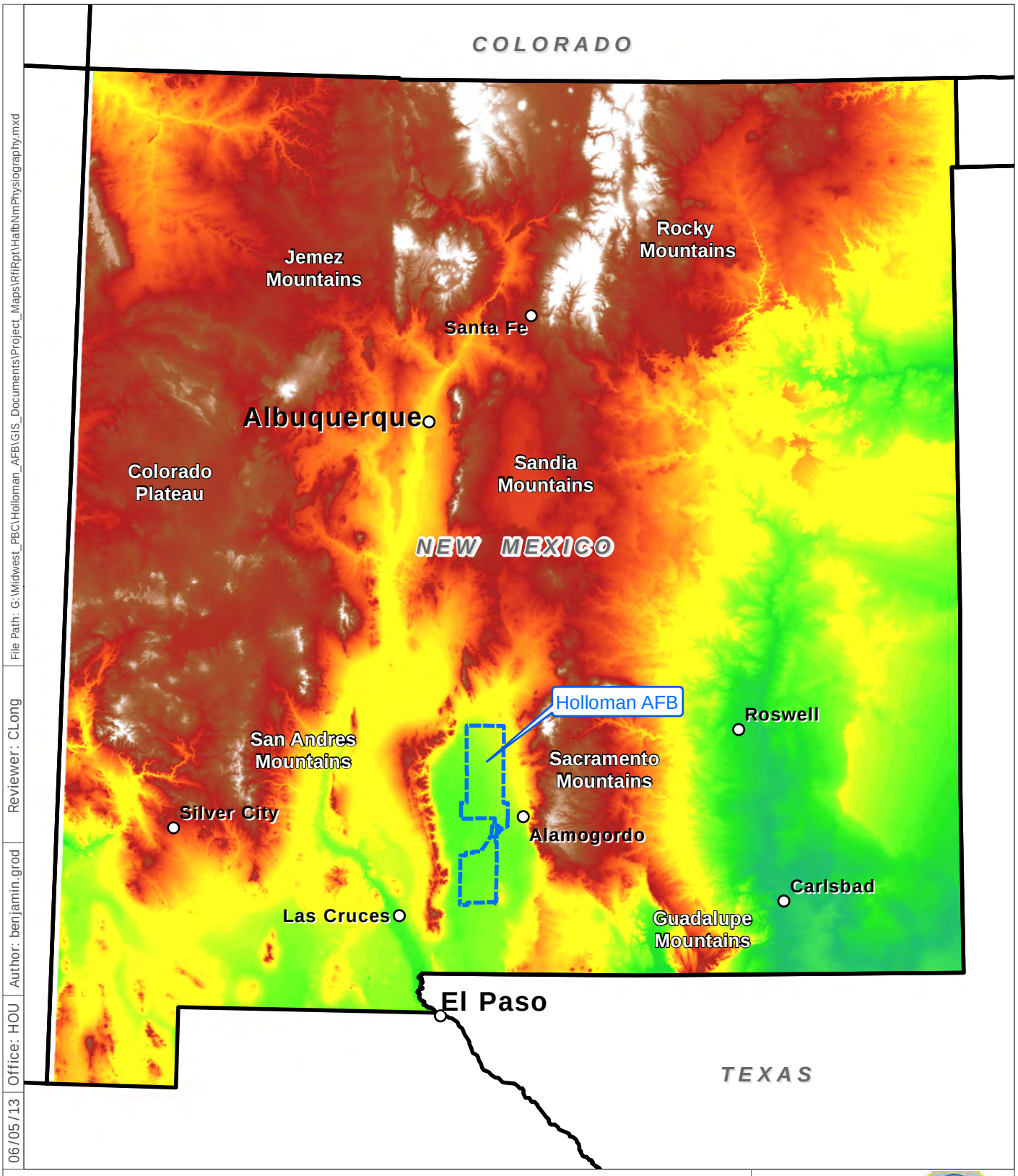


Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
Holloman AFB, NM



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Reviewer: CLong
Author: benjamin.grod
Office: HOU
06/05/13

Legend

Holloman Air Force Base (AFB) Installation Area

Elevation
- High : 3,936 meters
- Low : 0 meters

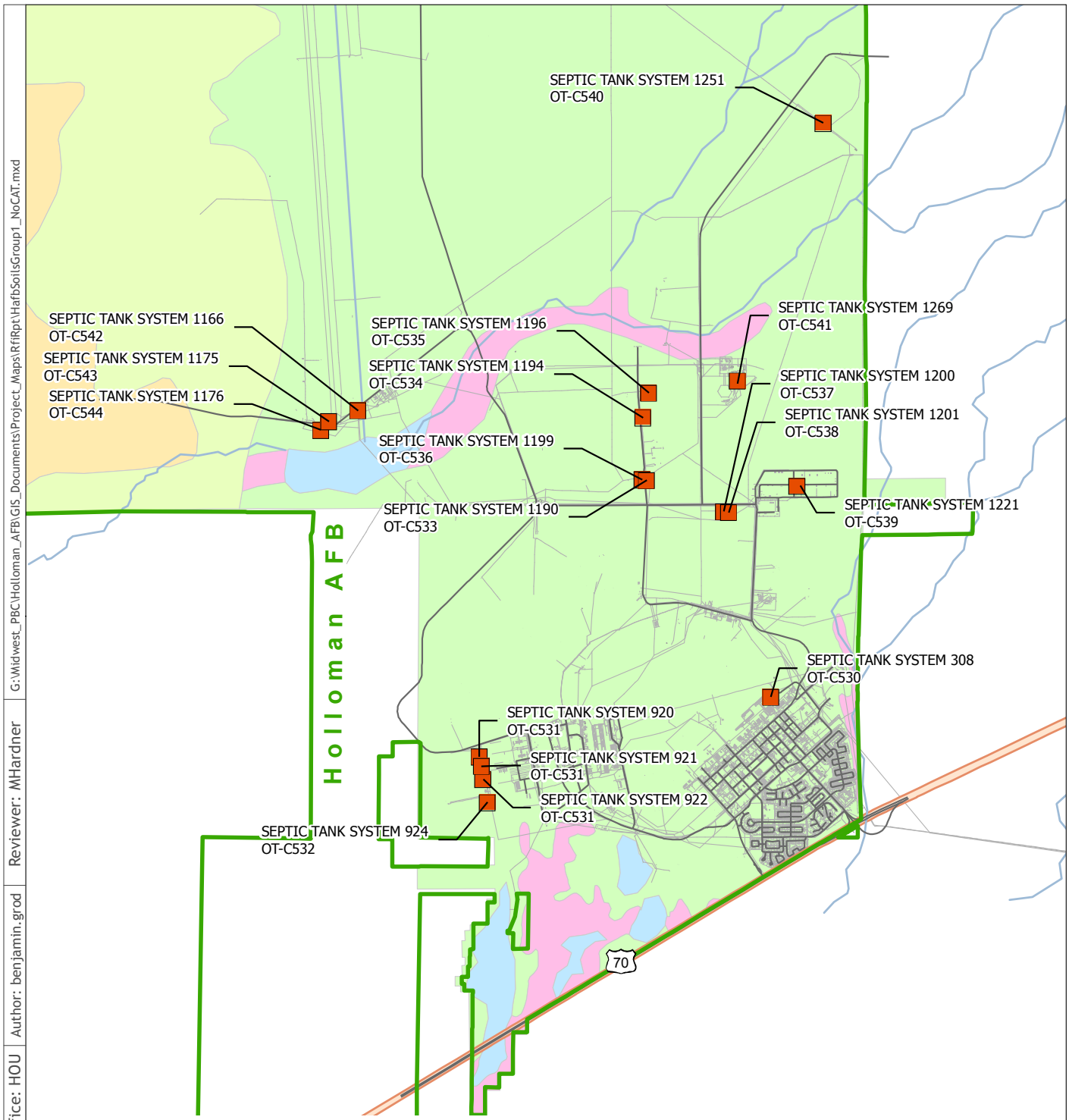
NAD 83 SPCS
New Mexico Central
Feet

0 50
Miles

Figure 2-1

Physiographic Map

Holloman AFB, New Mexico



Note:
1) Soils types at Holloman Air Force Base, New Mexico are based on United States Department of Agriculture (USDA) Soil Conservation Service Classifications. Source USDA, 1981

06/18/13 | Office: HOU | Author: benjamin.grod | Reviewer: MHardner | G:\Widwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbSoilsGroup1_NoCAT.mxd

Legend

- Installation Area
- Group 1 Septic Tank Sites
- Surface Water
- Active Dune Land Gypsum
- Duneland Yesum Association
- Holloman-Gypsum Land-Yesum complex
- Intermittent Water
- Mead Silty Clay Loam
- Rock Land Warm

NAD 83 SPCS
New Mexico Central
Feet

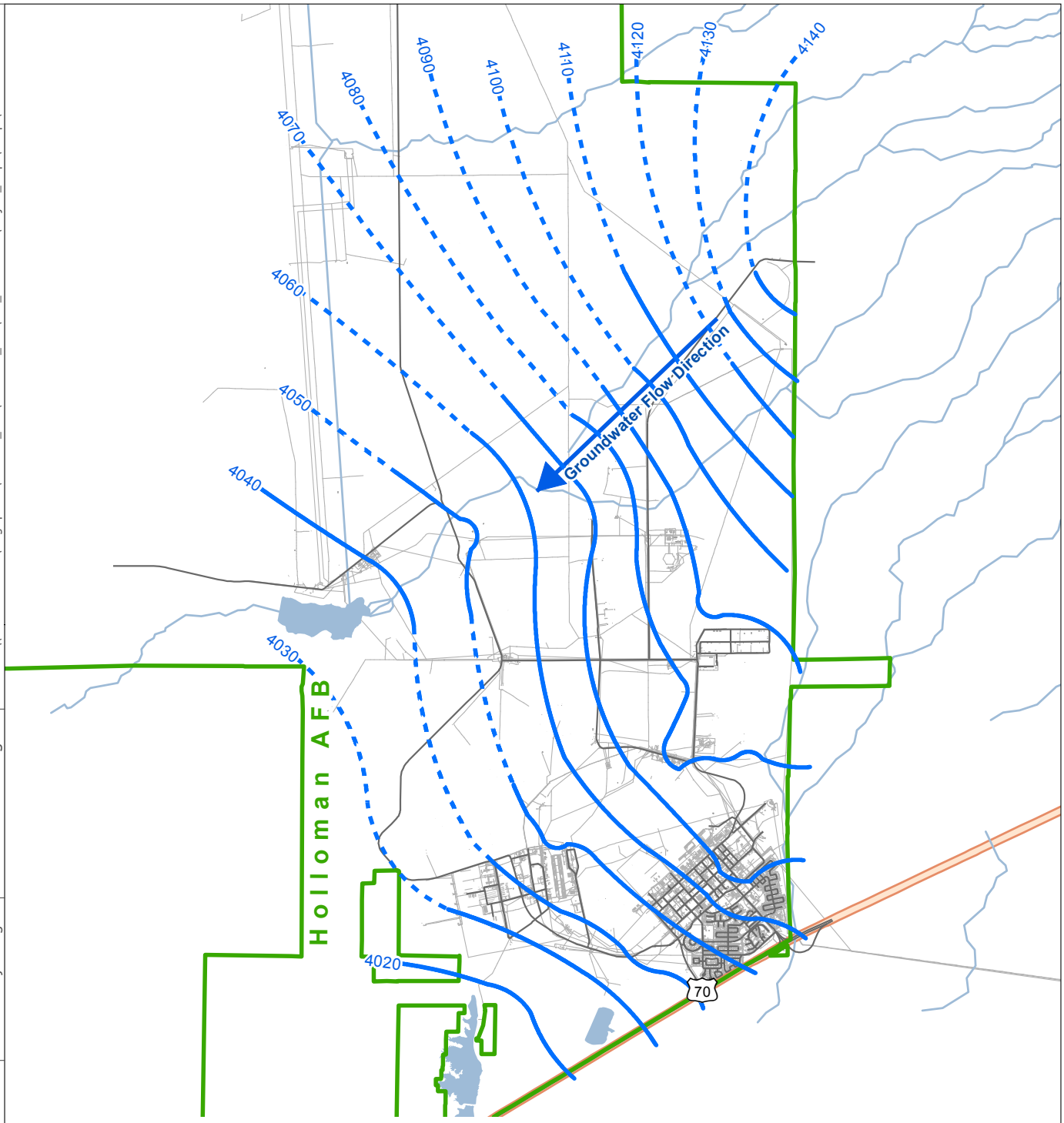
0 7,000
Feet

CBI

Figure 2-2

Septic Systems Soils Map

Holloman AFB, New Mexico



Note:
1) Groundwater contour map showing groundwater elevation contours across Holloman Air Force Base, New Mexico, are based on 2002 measurements taken from the shallow aquifer.
2) Source: Holloman AFB GIS, 2002 LTM.

08/28/13 | Office: HOU | Author: benjamin.grod | Reviewer: CLong | File Path: \\cfsfs01.cfs.com\arcgisprod2\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbGw2002.mxd

Legend

- Installation Area
- Groundwater Flow Direction
- Groundwater Elevation Contour (ft) (Dashed where inferred)
- Surface Water

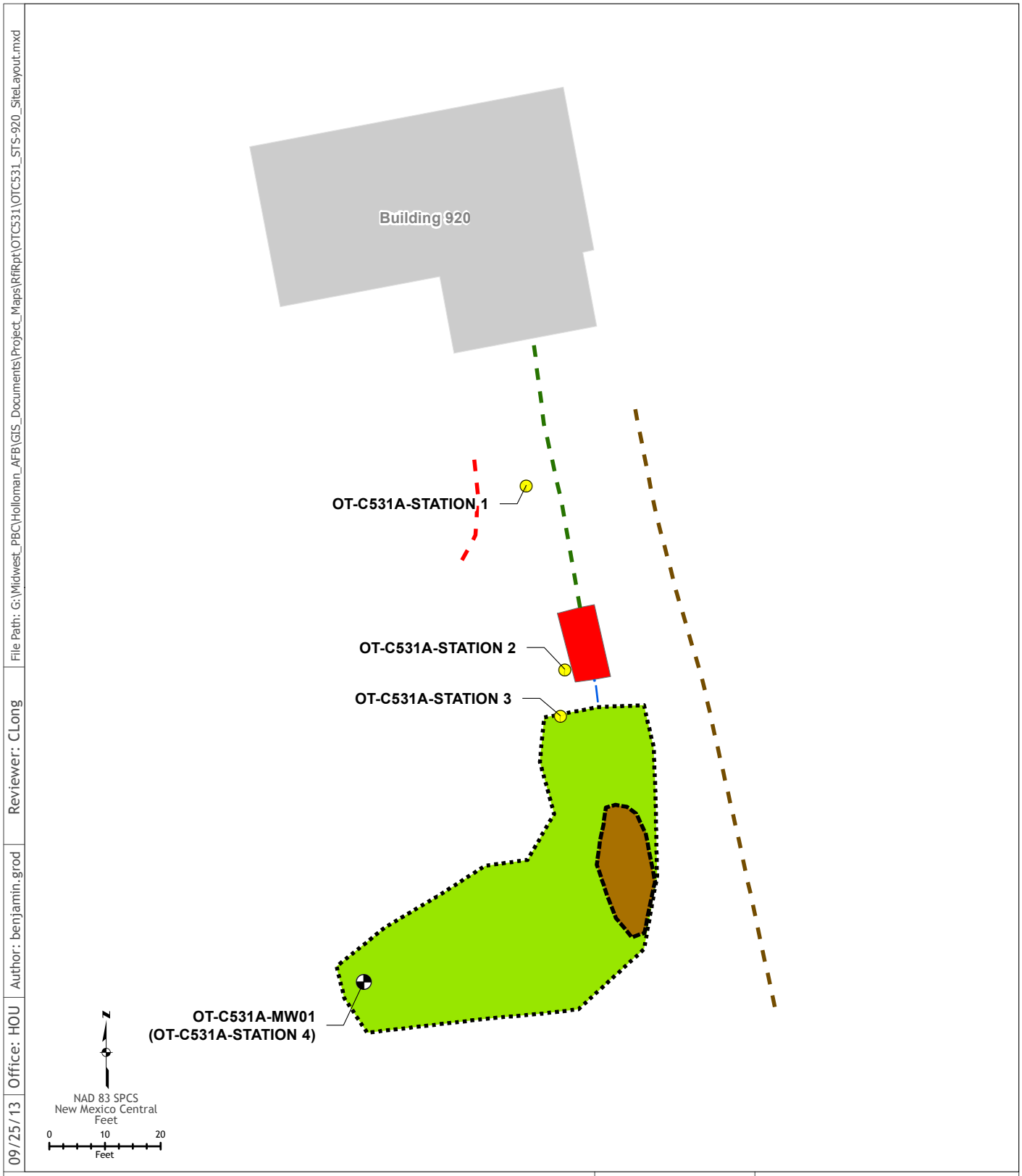
NAD 83 SPCS
New Mexico Central
Feet

0 8,000
Feet

Figure 2-3

Regional Groundwater Contour Map

Holloman AFB, New Mexico



Legend

- Monitoring Well
- Soil Boring Station
- Influent Line
- Effluent Line
- Electric Utility
- Unknown Utility
- Abandoned Septic Tank
- Leach Field
- Open Hole and Void
- Building

Note: The observed hole and/or underground void was observed during the survey, however the method of formation is unknown.

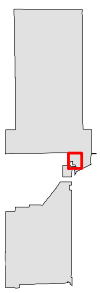
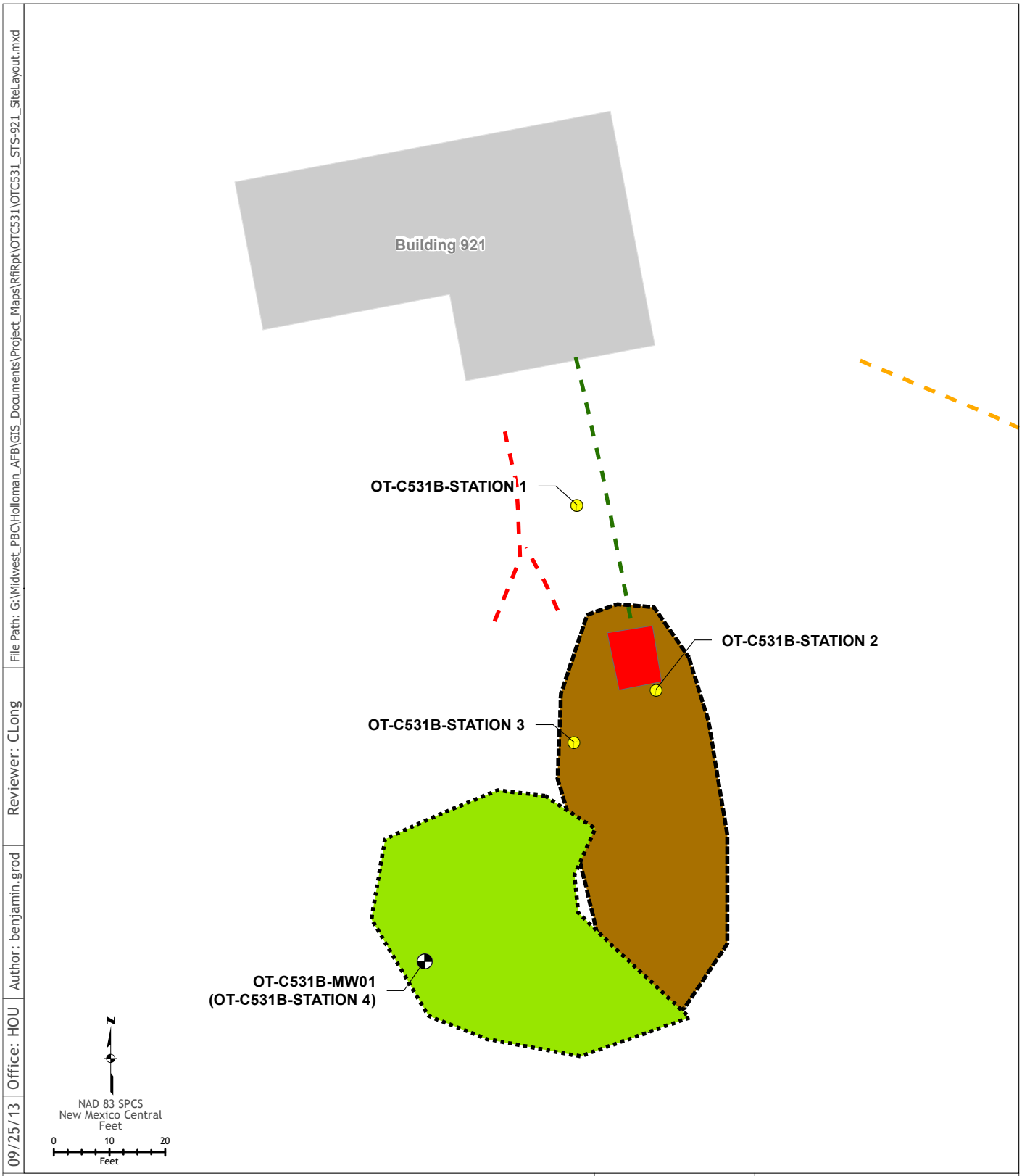


Figure 3-1a

Site Layout and
Sampling Locations
Building 920
Septic Tank System OT-C531

Holloman AFB, New Mexico



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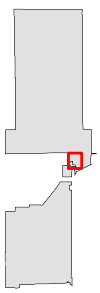
Legend

- Monitoring Well
- Soil Boring Station
- Communication Utility
- Electric Utility
- Influent Line
- Abandoned Septic Tank
- Leach Field
- Open Hole and Void
- Building

Note: The observed hole and/or underground void was observed during the survey, however the method of formation is unknown.

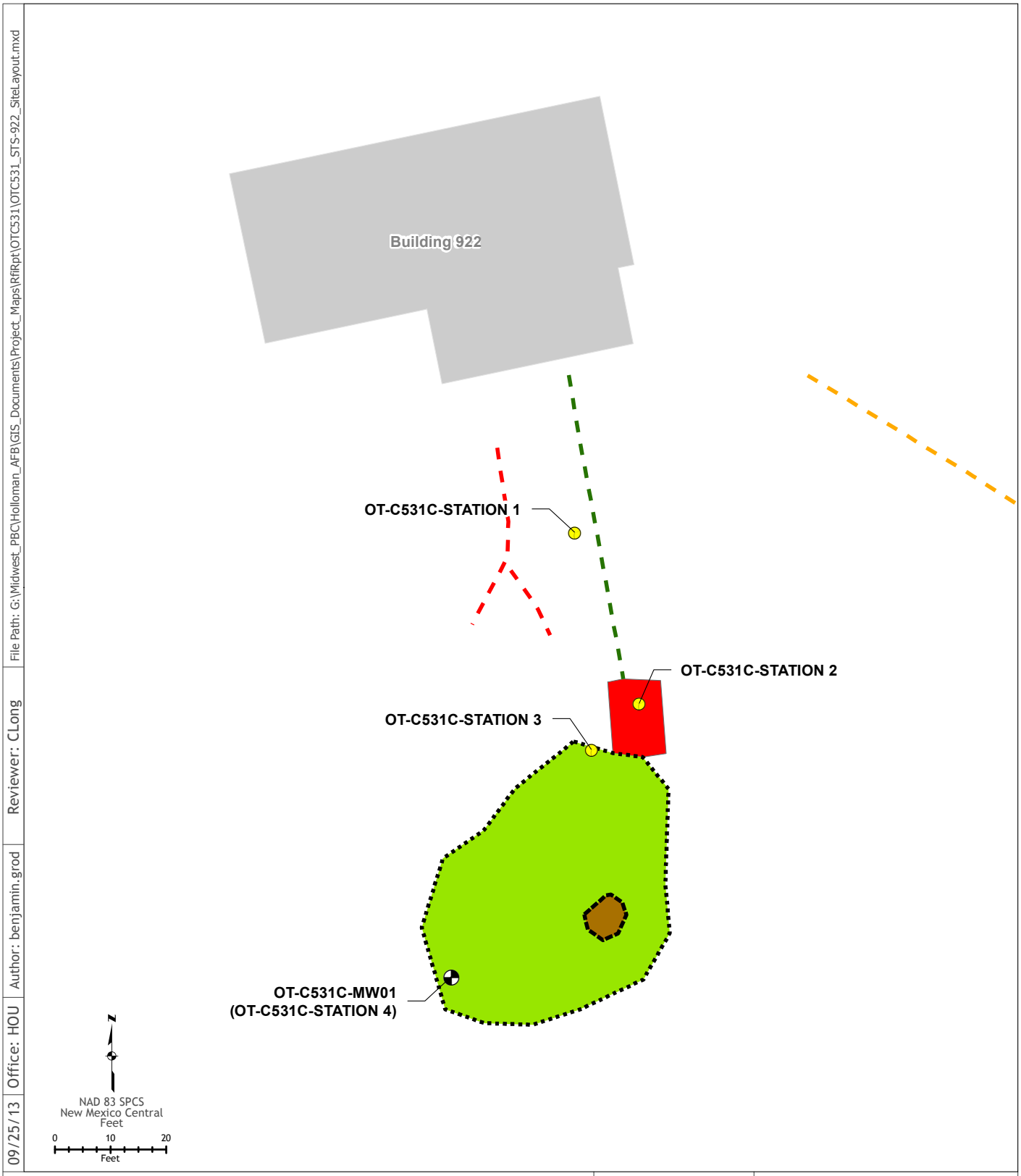


CBI

Figure 3-1b

Site Layout and
Sampling Locations
Building 921
Septic Tank System OT-C531

Holloman AFB, New Mexico



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Legend

- Monitoring Well
- Soil Boring Station
- Communication Utility
- Electric Utility
- Influent Line
- Abandoned Septic Tank
- Leach Field
- Open Hole and Void
- Building

Note: The observed hole and/or underground void was observed during the survey, however the method of formation is unknown.

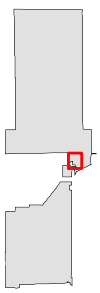


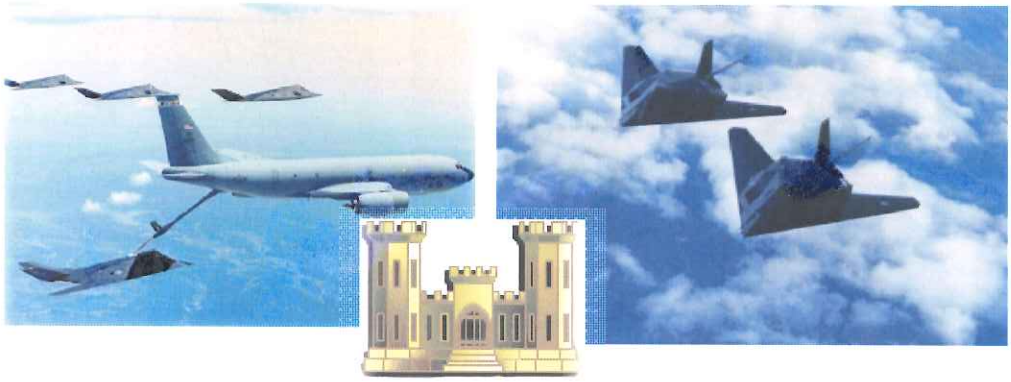
Figure 3-1c

Site Layout and
Sampling Locations
Building 922
Septic Tank System OT-C531

Holloman AFB, New Mexico

Appendix A
Historical Records

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS



Holloman Air Force Base
New Mexico

APRIL 2007

Headquarters, Air Combat Command
Langley Air Force Base, Virginia

49 CES/CEV
Holloman Air Force Base, New Mexico

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH FIGHTER WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

APR 27 2007

MEMORANDUM FOR NEW MEXICO ENVIRONMENT DEPARTMENT
Attn: Mr. James P. Bearzi
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe NM 87505-6303

FROM: 49 CES/CEV
550 Tabosa Ave.
Holloman AFB NM 88330-8458

SUBJECT: Submittal of Information Required by NMED Letter of August 30, 2006
Septic Tanks and Associated Drain Fields, Holloman AFB
EPA ID# NM6572124422

1. Pursuant to Part 4, Condition IV.B.3 of Permit No. NM6572124422, Holloman AFB is submitting the final portion of the required information.

2. This final portion of the required information covers the history of the facilities served by each septic tank and, based on the historic activities that occurred in each facility, the possible wastes that were discharged into the septic systems.

3. If you have any questions or comments, please contact Mr. Dave Griffin or Mr. George Fish at (505) 572-3931.

DEBORAH J. HARTELL
Chief, Environmental Flight

cc: w/Attachments
Mr. Cornelius Amindyas
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

Mr. David Strasser
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS
HISTORY

Holloman's records show a list of fifty seven (57) septic tank systems broken into three categories- Active Septic Systems, Inactive Septic Systems, and Removed Septic Systems. The systems are identified by the Building number they are/were attached to. There are twenty five (25) Active Septic Systems which are listed in this report. There are twenty one (21) Inactive Septic Systems that are listed and the history of activities in the building associated with the system is identified to the extent of available knowledge. There are eleven (11) Removed Septic Systems listed with histories based on available record knowledge.

The Active systems are identified, but no histories of the buildings are provided as this will likely change over time particularly with change in mission (aircraft on base) or tie-in to the base waste water treatment system. A history will be added to this list if and when the septic system is no longer needed and moved to the Inactive or Removed list.

The Inactive systems are scheduled for proper closure per guidance given in the NMED Liquid Waste Regulation 20.7.3.307 NMAC. This regulation calls for capping of the line(s) from the building to the septic tank, pumping out the tanks contents, penetration of the bottom of the tank, along with collapse of the tank roof and filling of the tank with sand or soil.

The septic systems on the Removed list have had the actual septic tank excavated and removed.

A search of Real Property records and the Historic Properties Inventory yielded the information available on the buildings. There was not information available on every building, but if new information becomes available, it will be added to the list.

Attachment 54a-e shows the current plan of where the sewer system lies to show what buildings are currently connected to Holloman's Sewer System. Any building that does not have an active septic tank is either abandoned or connect to Holloman's Sewer System.

ACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	149	1998		1000
2	312	1994		1000
3	375	1968		500
4	882			
5	864 (863)	1994	5'x8'x6'4"	750
6	885	1970	7'10"x4'8"x6'10"	1000
7	886			
8	887	1991		1000
9	923	1959	4'2"x7"x7'9.5"	1600
10	1022	1992		1200
11	1066	1994		1000
12	1160	1957	5'x12'4"x7'6"	1500
13	1161	1957		750
14	1162	1957		350
15	1163	1957		350
16	1169	1962		1680
17	1195	1962		1260
18	1256	1970	12'8"x4'8"x5'	
19	1270			
20	1271			
21	1278	2004		1250
22	1284			
23	1625			
24	75600	1989		1200
25	La Luz Gate (1290)(**1292**)	2004		1250

INACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	308	1965		
2	920	1959	4'2"x7"x7'9.5"	1600
3	921	1959	4'2"x7"x7'9.5"	1600
4	922	1959	4'2"x7"x7'9.5"	1600
5	924	1959	4'2"x7"x7'9.5"	1600
6	1091	1969	6'8"x3'x8'5"	
7	1097	1987	5'10"x5'x7'8"	1672
8	1190	1952	9'x4'x8'10"	3000
9	1194	1987	4'x4'x8'10"	1350
10	1196	1993	4'6"x11'x6'	1300
11	1199	1957		500
12	1200	1954	4'x8'x4'	1000
13	1201	1951	2'6"x6'6"x5'5"	650
14	1219	1985	5'4"x10'6"x8'4"	
15	1221	1983	4'8"x9'4"x6'2"	1100
16	1226	1985	5'6'2"x6'	
17	1235	1986		1189
18	1239	1977	4'6"x8'6"x6'	750
19	1250	1957		350
20	1251			
21	1269	1966	4'6"x9'	500

INACTIVE SEPTIC SYSTEMS

BUILDING 308

This is a 3200 SF building originally constructed in 1965. The original operation in the building was calibration of guided weapons for aircraft. In the 1970s and early 1980s the building was used as a nosedock for F-4 - Test Aircraft Radar electronic work area. It has never had a floor drain.
This facility is currently being used to store air craft support equipment for Building 309. The shop has been used in the past for servicing, inspecting, and repairing AGE equipment, but due to the reduction in personnel, this work is currently only performed in Building 309. The need to expand the work area for AGE equipment maintenance into Building 308 in the near future is not anticipated. A current view of the building is shown below in Figure 1.

Figure 1: Picture of Bldg. 308

Facilities associated with the septic system consist of:

- Toilet
- Lavatory
- Janitorial Sink

The building is located at 340 Delaware Ave. The point of contact for this building is Ms. Vicky Cruz and Mr. Adam Ferrara, they can be reached at 575-~~475~~-5272. The hours

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of operation for this building when it is in use is one 8.5 hr shift (0630-1500) and one 9 hr shift (1500-2400), five days per week.

Industrial Wastewater Drainage: There are no floor or trench drains in this facility. A janitor's sink is located in the restroom. The sanitary sewer pipe from the restroom connects with the pipe from the restrooms in Building in 309. The effluent pipe then proceeds south to Manhole 334E the layout of this facility can be seen below in **Figure 2**. At the time of the inspection surveyors were unable to open Manhole 334E. No cross-connections to the storm sewer were identified.

Industrial Wastewater Sources/Existing Pretreatment/ Existing Management Practices: There is only once source of industrial wastewater from this facility: floor washing

Floor Washing: The floor in this facility is washed every three months using a Tennant floor scrubber, 10 gallons of water and Simple Green. Average and maximum daily wastewater flows from this activity are estimated to be less than one gallon and ten gallons, respectively. The wastewater from this activity is discharged into the French drain at Building 309; therefore, the quantity of wastewater generated by this activity is included in the flow summary for Building 309.

Existing management practices consist of sweeping the floor prior to washing it.

Site Description: Aircraft Corrosion Control
Site Specific Contingency Action Plan: See Attachment 1
Secondary Containment Routes: None
Probable Spill Route: Leaks dissipate in local area on ground
Material Compatibility: No material incompatibilities

Connected to Sewer?

Stored Substances:

Chemical	Container Type
MEK	1 gallon can
Polyurethane Paint	1 gallon can
Naptha	1 gallon can
Toluene	1 gallon can
Epoxy Primer	1 gallon can
PD-680 Type II	55 gallon drum
Waste Paint/Thinners	55 gallon drum

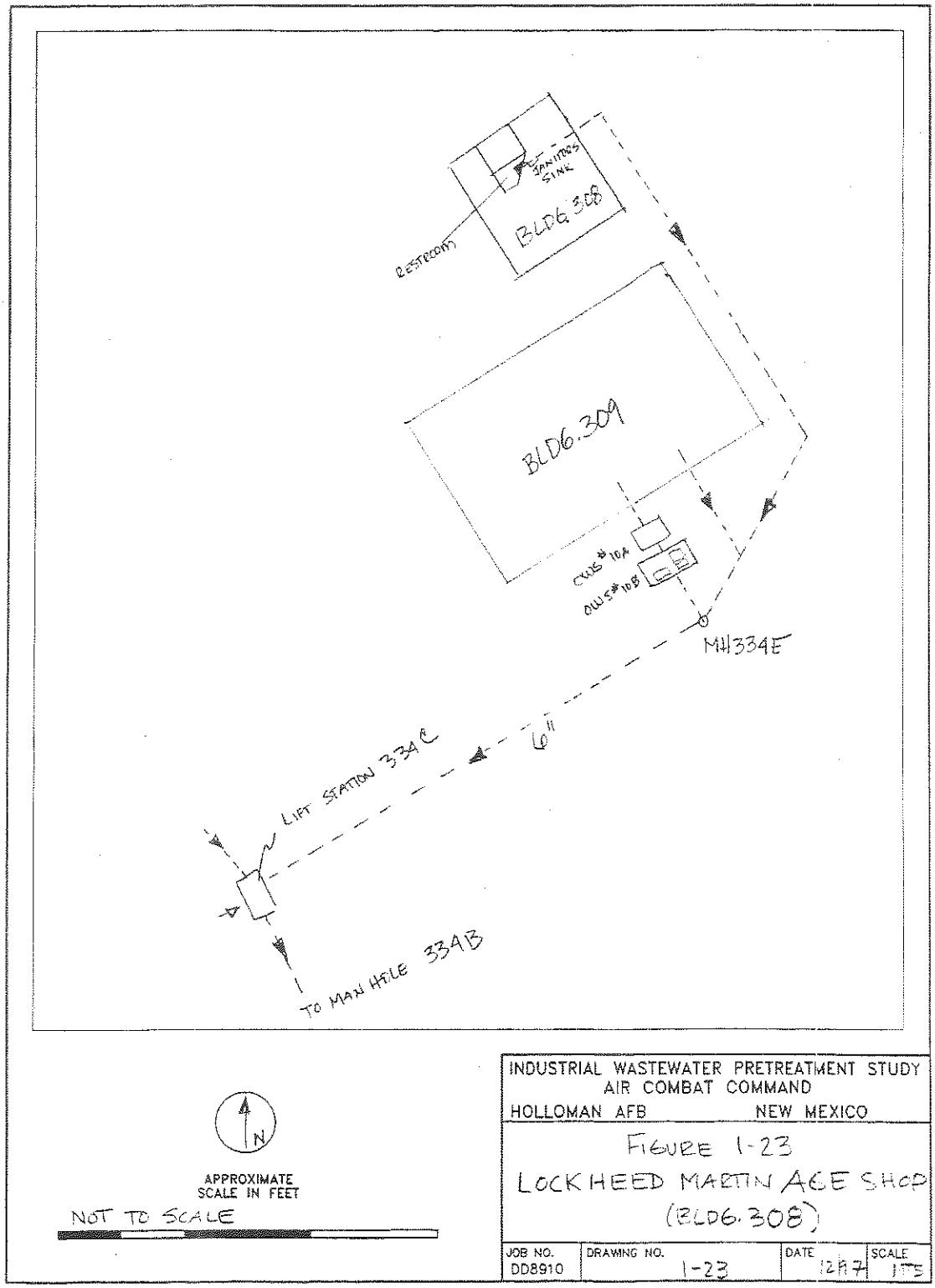

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Figure 2: Layout of Bldg. 308 and 309

INACTIVE SEPTIC SYSTEMS

BUILDINGS 920, 921, 922

These are three identical buildings constructed in 1959. Each building has 1900 SF. They were originally built for ammunition assembly which primarily consisted of bolting rocket components together prior to use. All three buildings are presently vacant and empty.
Each of the three buildings has a simple bathroom consisting of a:

- Toilet
- Lavatory

Multiple inspections were set up for this site, but no one showed up. Therefore, no follow-up information was found. Pictures of the current buildings are shown below in Figures 3-5.

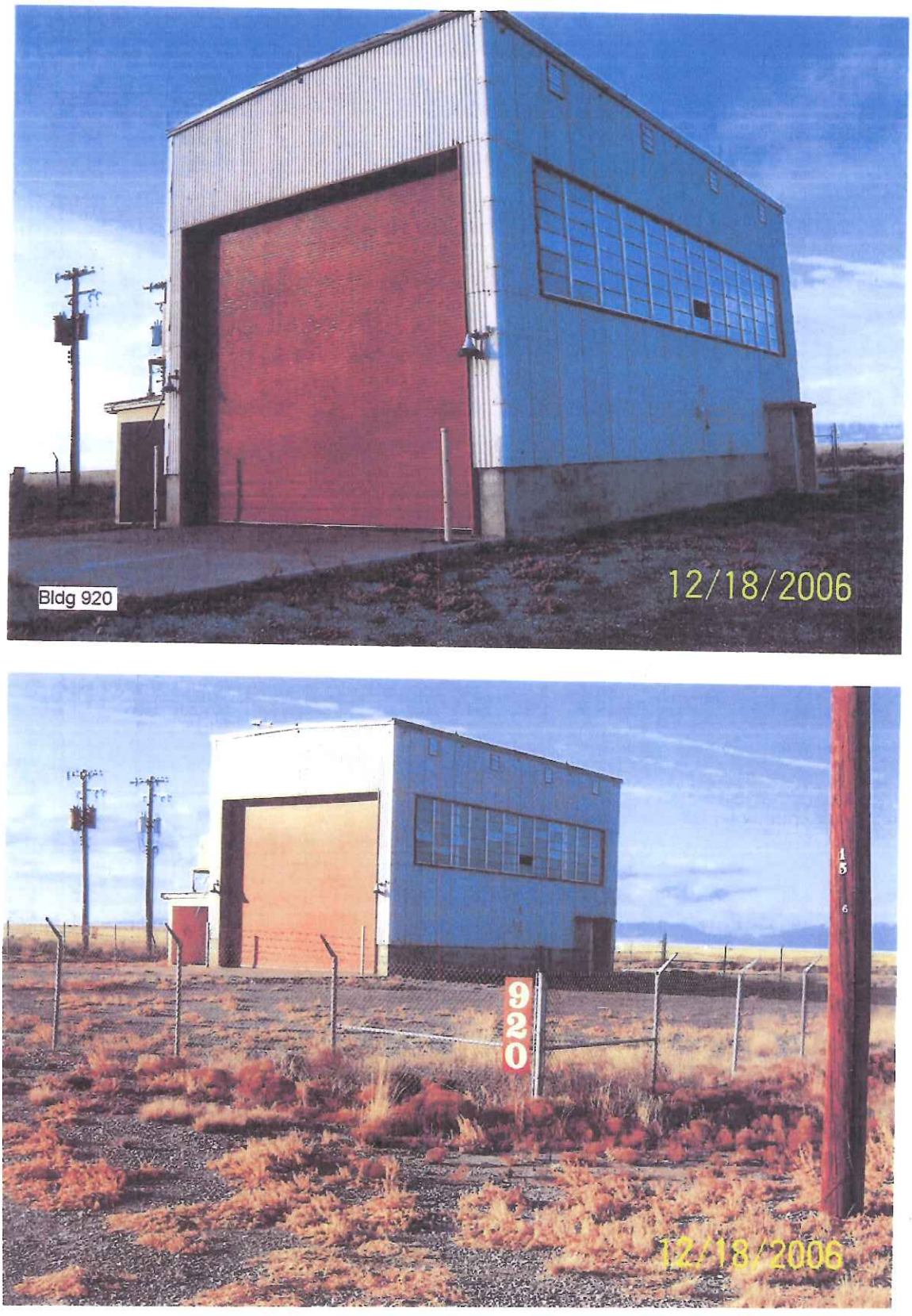


Figure 3: Pictures of Bldg. 920

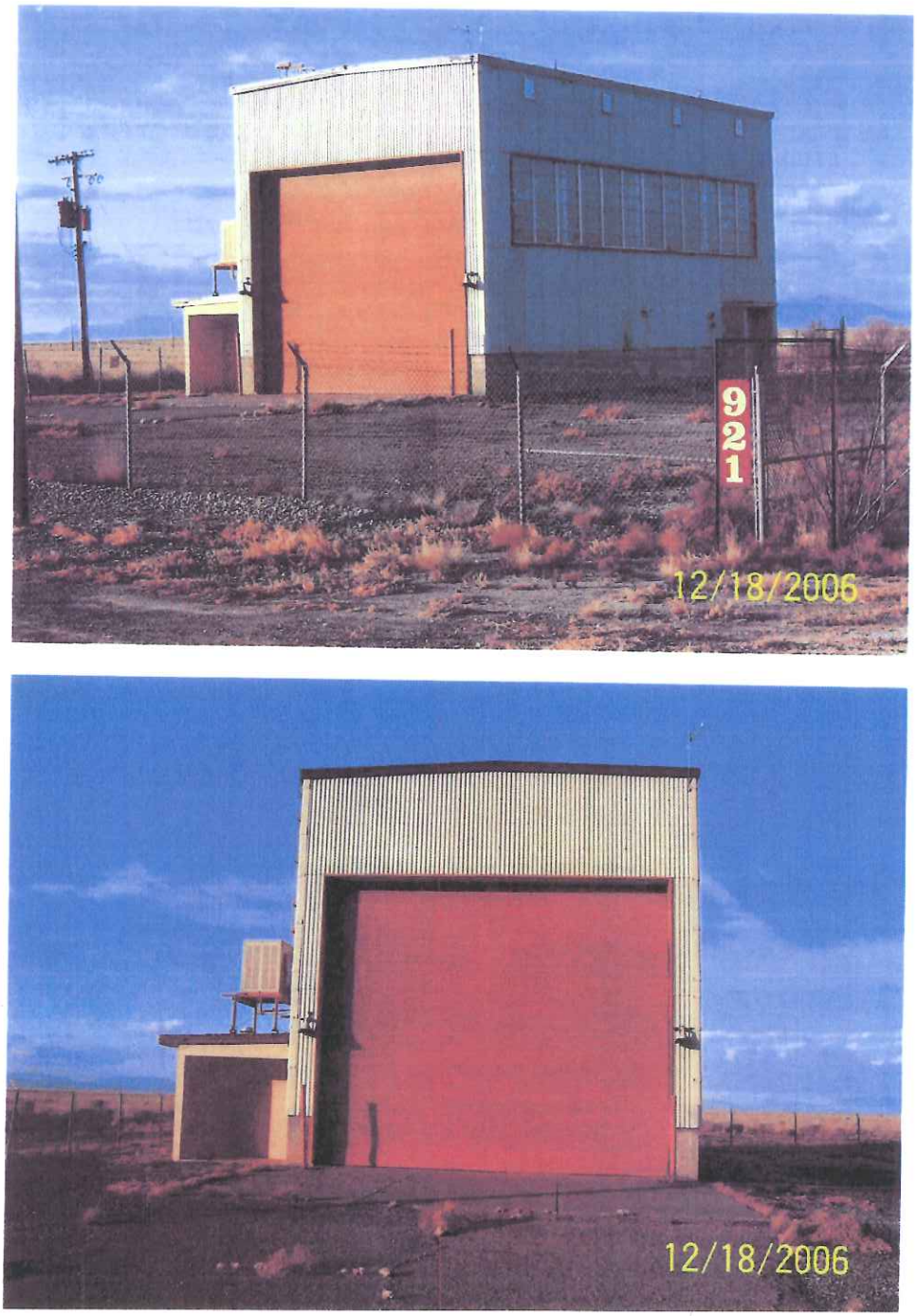


Figure 4: Pictures of Bldg. 921

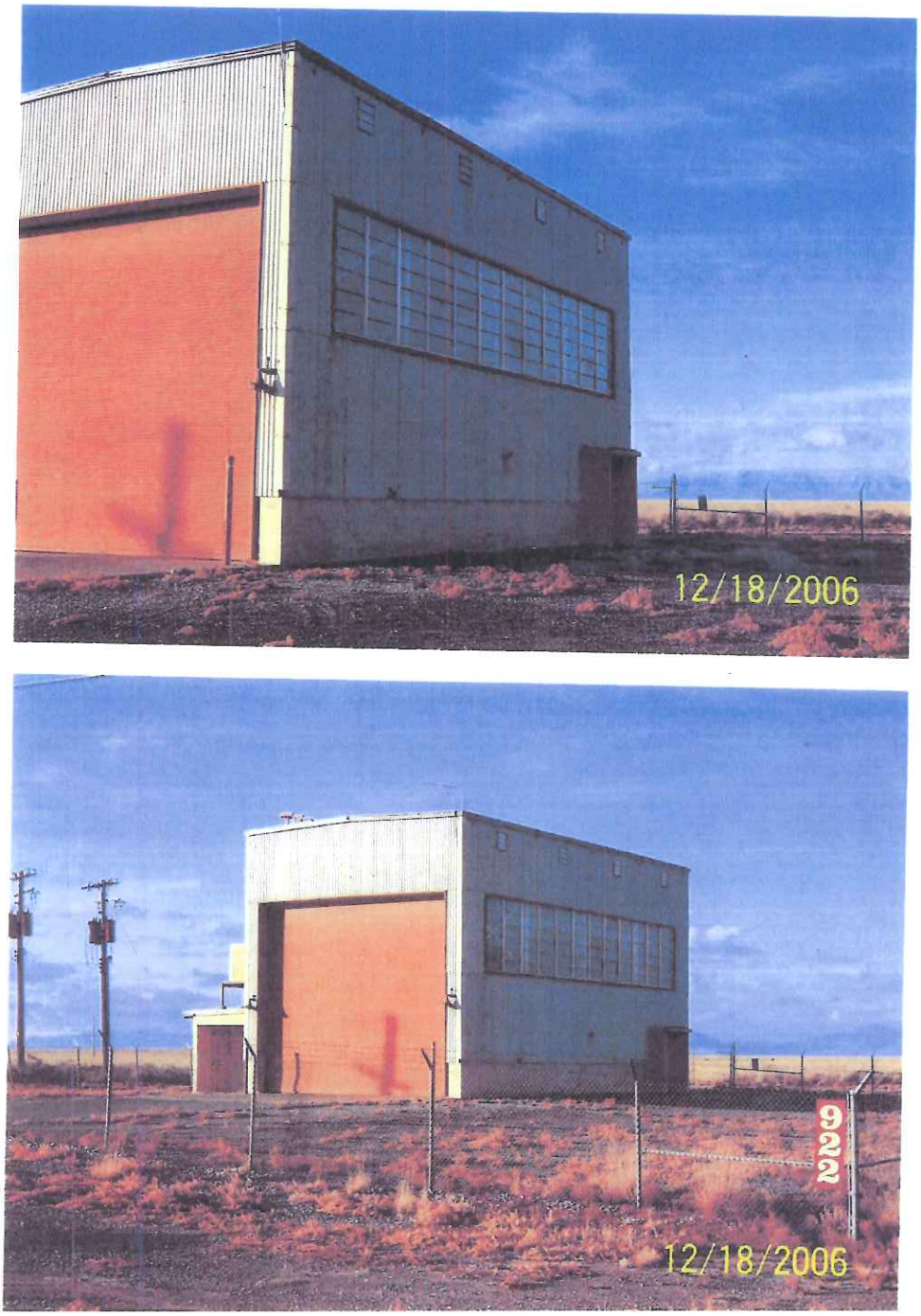


Figure 5: Pictures of Bldg. 922

INACTIVE SEPTIC SYSTEMS

BUILDING 924

This building was constructed in 1959 and has 4800 SF.
The building's original service was ammunition assembly similar to buildings 920-922.
It was later used for maintenance of radar tracking equipment.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

An on site inspection was done for this building on 20 Dec 2007 with the current facility manager, Mr. Michael Tackett. He did not have any information about the history of the septic tank system. Currently the building is being used for munitions storage. For the past two year it has stored rocket motors for the test track. From the on site inspection and drawings (Attachment 4-6) it can be seen that the bathroom drain is separate and there are no floor drains.

There are no pictures on file of this building.

INACTIVE SEPTIC SYSTEMS

BUILDING 1091

Site Description: There are no current files on this building because the building has been demolished. The building served as the Airfield Control Tower until replaced by the present Control Tower
On Attachment 55b a drawing of where the leach field was located in 1984 can be seen.
Grid Coordinates: J.9, 10.2
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: No secondary containment associated with underground storage tank
Probable Spill Route: Leakage from underground tank will contaminate water table in local vicinity

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 / UST

There were also three drawings that were discovered during the research stage of the project. The drawing (Attachment 7) shows the Septic Tank Details, Septic Tank Drain Field and the Drain Field Details.

INACTIVE SEPTIC SYSTEMS

BUILDING 1097

Specifications and history of this building are given in the following "Cold War Survey: Holloman Air Force Base". Along with this survey an on site inspection was done on 28 November 2007 with the current facility managers, A1C Clinton Bennett and TSgt Robert Edyburn. During the on site inspection it was discovered that the bathroom is separated from work area drains. In the past the building was used as a communications work center (office space) until 2005. There are no floor drains in the work area. It is currently being used as a houses base for a radio system network. There were also three drawings (Attachment 8-10) that were discovered in the investigation phase of the project. The drawings show the Materials Septic System, the Septic Tank Placement and Piping, the Latrine Plan, and the Mechanical Plumbing Plan.

Facilities in this building consist of:

- Toilet
- Urinal
- Lavatory

Description: Communications facility
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: None
Probable Spill Route: Leaks dissipate in local area on ground

Tank Location: South of facility
Fuel Flow – South/West

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 /AST
	500 gal each/ 1 /UST (Abandoned)

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Communications, Receiver.
Historic: Transmitter/Receiver.
Street Address: 1432 Sabre Road, HAFB, 88330-7842.

Building Number: 1097

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [ ] Minor [ ] Moderate [x] Major

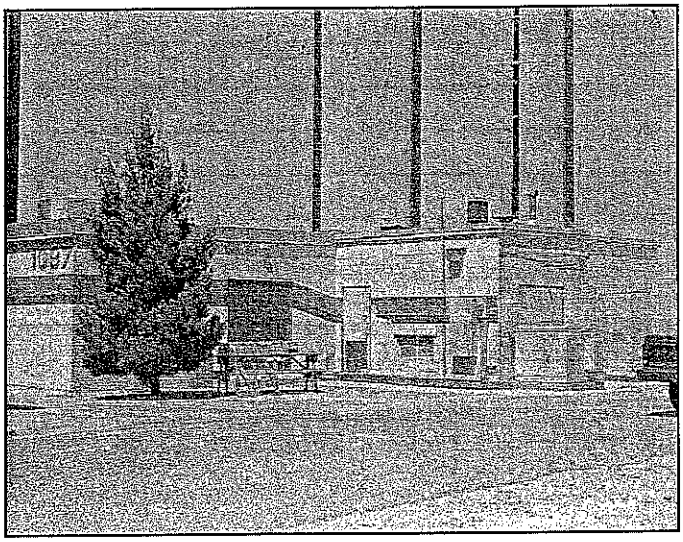
Comments:

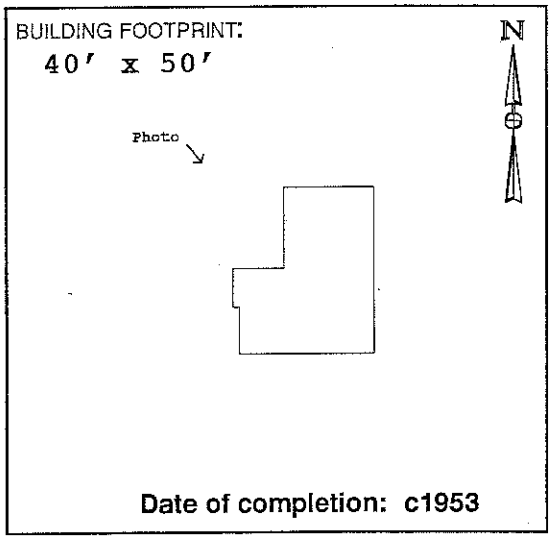
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1097 has not retained historic integrity.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1953

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1097 is a small transmitter building designed with few embellishments for utilitarian use only. Building 1097 originally had a rectangular footprint identical to Building 1098 and Building 1095. The original floor plan was sectioned into 4 rooms. An addition was constructed at the west elevation in 1986 using compatible structural and architectural components (CE File #1097-1). Both the builder and the architect are unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1097.

Current Function: Receiver/Air Traffic Control/Radio Control.

Original Function: Transmitter/Receiving/Communications.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1098-1 (c1952).

Foundation: Concrete wall footing. Concrete slab on granular fill.

Exterior walls: Painted concrete masonary units (CMU).

Roof: BUR on 2" rigid insul.; 2" poured gypsum on gyp board sup. by steel joists.

Notable interior features, including machinery:
Construction drawings document *"UHF Radio Air/Ground Facilities AN/GRC-27"*.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:
Continues to function as a communications facility/receiver site.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1097 has served as a Base communications facility since its completion c1953. Several renovations have resulted in a loss of historic integrity for this building. Building 1097 is no longer eligible for the National Register of Historic Places.

VII. ASSOCIATED BUILDINGS:

Location plan CE File #1098-2 identifies at least three north area transmitter sites. Building 1097 was associated with transmitter Building 1098. This facility is also associated with the flightline, and with communications Building 221.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building #1097 retains its original function as a radio receiver facility, however it has been modified to accommodate electrical, mechanical, and equipment additions and change-outs. Original equipment has been replaced.

Office space was added to the south elevation (1986: CE File #1097-1). All six windows at the north, east and west elevations have been blocked in. Original doors have been replaced. Vinyl floor tile covers original tile throughout. Dropped ceilings have been added.

This building, although retaining historic significance as a receiving site, has lost integrity of design, materials, workmanship, and association with its period of significance. Note: A Sgt. Boots (extension 3132) was identified by Building 1097 personnel as being a possible source for oral history research concerning specific activities associated with this facility.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Office space added to the west elevation (c1986: CE File #1097-1).

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Construction of adjacent buildings has altered viewshed.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Windows have been blocked in.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: An addition obscures the original west elevation. The original window treatments removed. Dropped ceilings added. Original asphalt floor tile covered.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: The presence of interior communications equipment and exterior poles contribute to the integrity of feeling as a radio site.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

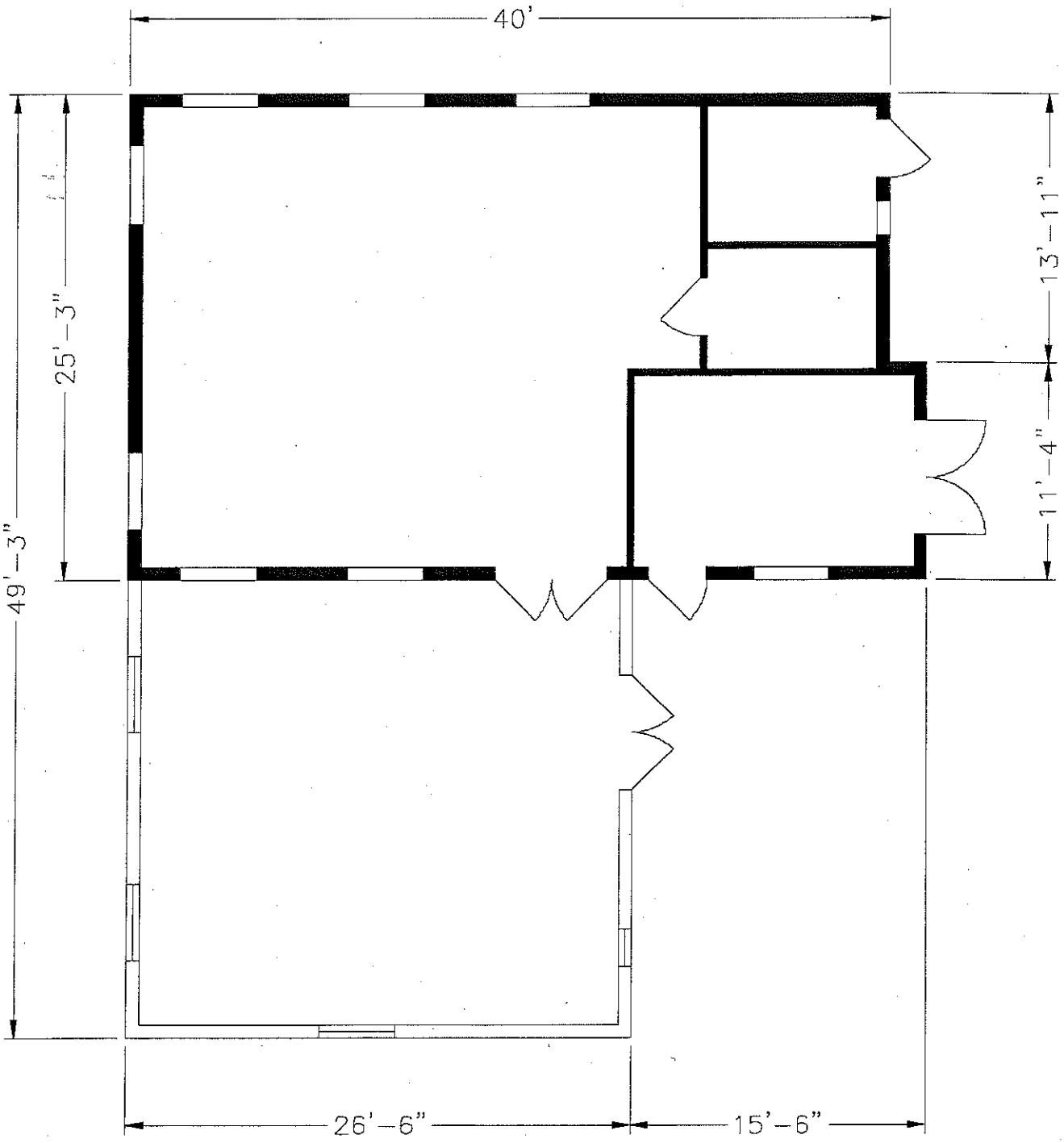
Comments: Original equipment has all been replaced.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #81**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



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Source: CE File #1098-2 (c1971)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1097** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1190

This building was constructed in 1952 and demolished in 2002. Specifications and history are provided in the "Cold War Survey".

The only drawing discovered was the plumbing floor plan and it can be seen in Attachment 11. Attachment 55d shows the current location of the leach field in 1984.

2002 Demolished Due To Unrelated Condition

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Security Police Building.
Historic: Change House/Unconventional Fuel Storage.
Street Address: 1514 Lethal Road, HAFB, 88330-7840.

Building Number: 1190

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1190 is in need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

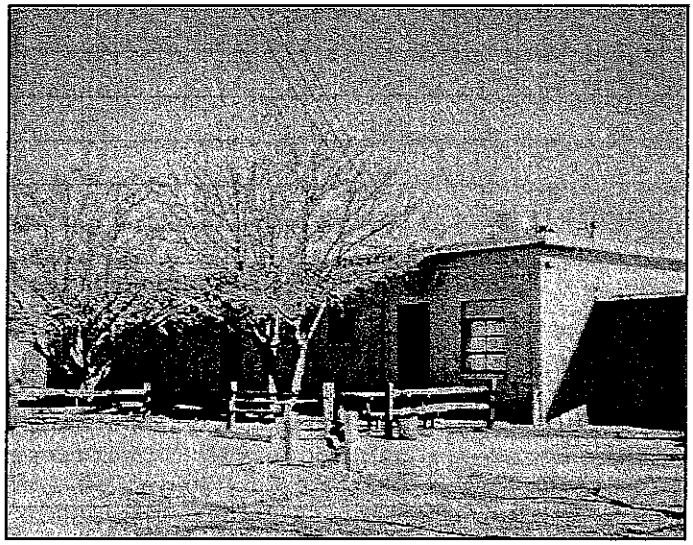
Comments: Interior partitions have been removed (date unknown).

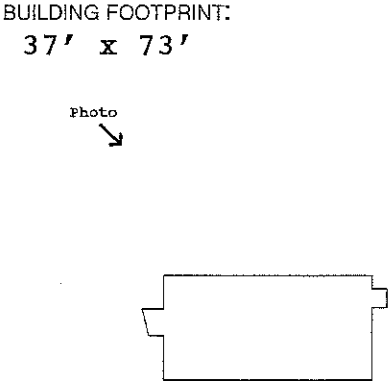
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1190 is a single-story, flat-roofed, concrete masonry unit (CMU) building exhibiting large roll-up equipment doors, numerous personnel access doors, and asymmetrical window fenestration. Construction drawings prepared in 1951 were stamped "As-built" but were not stamped in the revision block. Real Property Accountable Record/1190 indicates that Building 1190 was completed c1952 as a Change House for unconventional fuels personnel. W. C. Kruger Company (Santa Fe, NM) provided the construction drawings stored in CE File #1190. The builder is not known. A comparison of the current building and original blueprints reveals that no structural modifications to the building have occurred.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1190; CE File 1195-1 (c1951).

Current Function: Security Police operations.

Original Function: Change House, Unconventional Fuels.

Interim Functions: "RC Con House" (n.d.); "Prpln R-L Fuel/Lub" (n.d.); Prop Res Lab Rocket" (n.d.); "Prpln R-L Rkt" (n.d.); Sp Operations (n.d.).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1190-1 (c1951).

Foundation: Poured concrete footings and grade beams; concrete slab.

Exterior walls: Concrete masonry units (CMU).

Roof: (Built-up) gravel on rigid insul.; 2" slab sup. by metal lath and steel joists.

Notable interior features, including machinery: Shower stalls, locker room, dressing room, and laboratories.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

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VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Recommend reassessment of Building 1190 once the fifty-year construction date is met in the year 2002. This building retains historic integrity.

VII. ASSOCIATED BUILDINGS:

According to CE File #1190-1 *Title Sheet*, Unconventional Fuels Storage Building 1190 was associated with Building 1194 (Booster Inspection), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

This building retains all aspects of historic integrity. Although not meeting the "exceptional importance" standard imposed on buildings constructed within the last fifty years, Building 1190 remains potentially eligible as an individual property once the fifty-year date of construction is met in the year 2002. Recommend inclusion in a Multiple Property nomination along with the other unconventional fuels storage buildings. Building 1190 is currently being used as a storage and administrative facility by the 49th Squadron Security Police personnel. The original shower stalls, dressing room, locker room, shop, tools and supply rooms are all used for storage. Free-standing shelves have been installed to accommodate storage. As a result, some original doors and windows are blocked from view. Minor alterations have occurred at the interior. Two partitions have been removed. Glazed tile walls appear to have been added to at least one office. Vinyl tile has been installed over one section of the concrete slab in what once served as a machine shop. Some of the window panes have been painted. Because this facility remains potentially eligible, recommend that the original design features be considered in future modifications, and that photographs document any changes to the essential features. Suggested routine maintenance: Prune trees away from principal facade. Noticeable water damage warrants inspection of the roof. Replace broken window panes. Repair hole at exterior south elevation wall.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: Interior room layout as a Change House remains a key design element. This layout includes large open interior spaces, smaller labs/offices, and showers, dressing, and locker rooms used by unconventional fuels personnel.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Although no longer used as such, Building 1190 continues to be situated in the vicinity of other buildings historically associated with unconventional fuels testing and storage. This building appears to been recently landscaped.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two interior partitions removed. Glazed tile walls in office rather than CMU shown on original drawings.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Nearly all original workmanship remains visible, particularly at exterior.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Aside from the change in operations occurring here, Building 1190 remains essentially as it was originally constructed.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

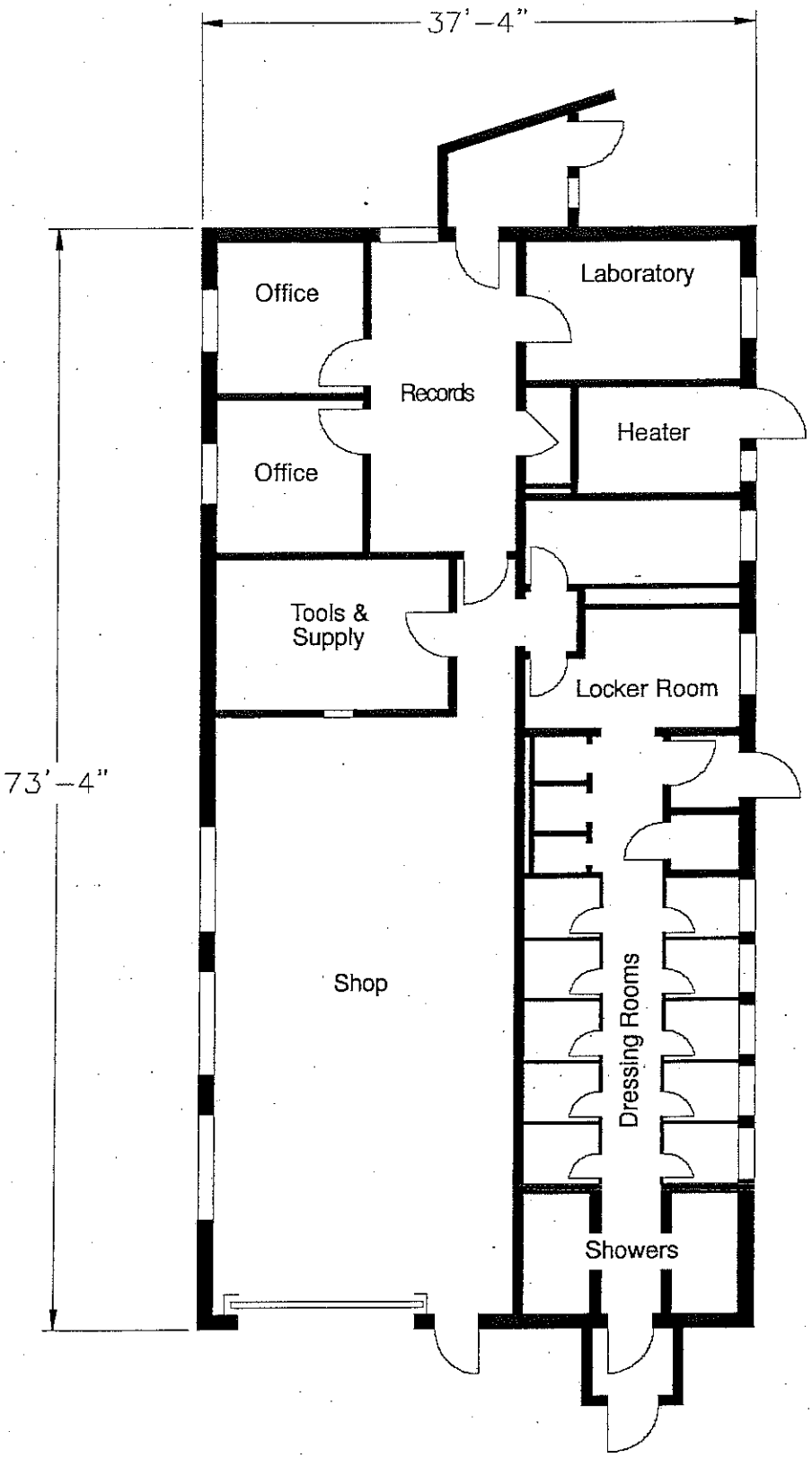
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #-Photo #**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1190-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1190** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Mike Gardner* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1194

Specifications and history are given in the "Cold War Survey".
Facilities in this building consist of:

- Toilet
- Lavatory

An on site inspection was done on 7 Jan 08 with the current facility manager, SSgt Joshua Roberts. In the inspection it was noted that the bathroom is separated from the work area drain. There was no history known. The building is currently being used for storage and it has been used for storage and has been used for storage for the past ten years.
Attachment 55d shows where the leach field for Bldg.1194 was located in 1984.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME: **Building Number:**

Current: Research Equipment Storage.

Historic: Booster Inspection/Unconventional Fuel.

Street Address: 1584 Lethal Rd., HAFB, 88330-7840. **1194**

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1194 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

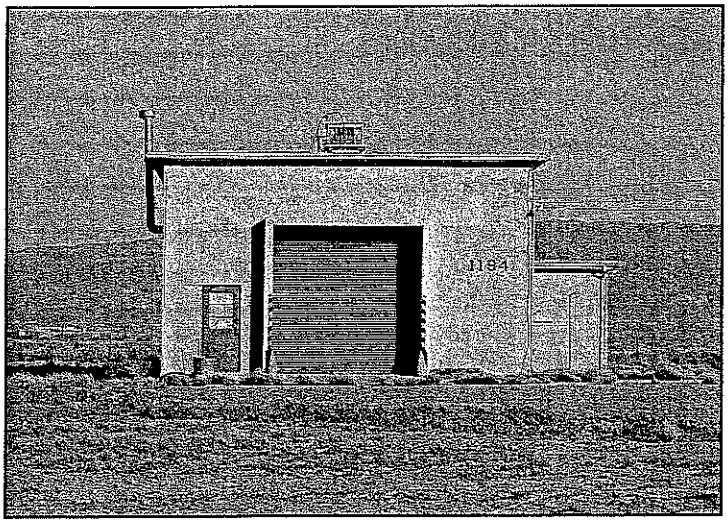
Comments: Interior partitioning is reversible.

Preliminary Determination of National or State Register Eligibility:

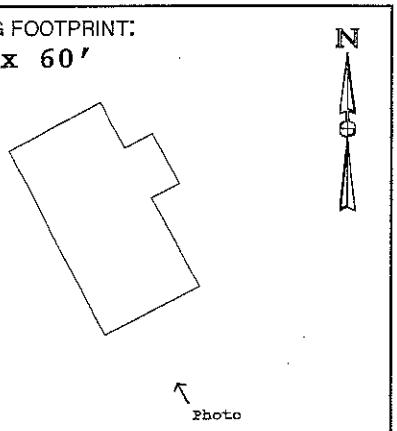
[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.



BUILDING FOOTPRINT:
30' x 60'



Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1194 is a rectangular, single-story, high bay structure made of concrete masonry units (CMU) and exhibiting a flat roof. The principal elevation faces west, showing one large roll-up door, and one personnel door. One row of windows is located below the eave line at the north and south elevations. The ceiling at the interior is exposed. "As-built" construction drawings show that Building 1194 was completed in 1952. W. C. Kruger Co. (Santa Fe, NM) provided the architectural work (1952: CE File 1194). The builder is unknown. No structural modifications to the original structure were noted.

III. HISTORIC AND CURRENT USE:

Current Function: Research equipment storage.

Original Function: Missile Assembly Test Building/Booster Inspection.

Interim Functions: "Mls/Space Rsch Tst" (n.d.); "M/Assembly Test Bldg" (n.d.); "Shp Wpn and Rlse Sys" (c1976); "BE Stor Cv Fclty" (n.d.); "Rsch Equip Stor" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1195-1 (c1952).

Foundation: Poured concrete footings and stem wall. Slab on compacted fill.

Exterior walls: CMU between concrete columns and bond beams.

Roof: BUR gravel. Rigid insulation. 2" concrete deck supported by steel joists.

Notable interior features, including machinery:

4-ton Wright Company chain-operated crane and hoist system, hoist no. 5197, serial no. 4925. The hoist is attached to a runway "I"-beam (crane) supported by steel support beams. Large metal roll-up doors at east and west elevations.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

210

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1194, although not meeting the "exceptional importance" standard, may be eligible for the National Register for its role in early Cold War materiel development once the fifty-year construction date is met in 2002.

VII. ASSOCIATED BUILDINGS:

According to CE File #1195-1 (c1951) *Title Sheet*, Building 1194 was associated with Building 1190 (Change House), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1194 remains essentially as it was constructed c1952. The original floor plan layout included one main room and an equipment room. A small area in the northwest corner of the main room has been partitioned. No documentation was found pertaining to this modification. This minor partitioning of the main room is reversible. This building is no longer associated with either missile assembly and test activities or unconventional fuels storage, and currently serves as an equipment storage room for the 6585th Test Group. Construction drawings (1956: CE File # 1194-1) show that an addition to this building was planned. There is no indication that this addition was ever built. Because this building retains historic integrity, and may be eligible for the National Register under Criteria A and/or C once the 50-year construction date is reached in the year 2002, recommend that future modifications take essential design features into account. Note: One isolated occurrence of prehistoric artifacts was noted on the grounds north of the building, including one white chert core, and one secondary chert flake.

Suggested routine maintenance: Scrape, prime, and paint the exterior. Replace downspouts. Prune landscape plantings away from foundation.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Construction drawings show plans for an addition to the north elevation (1956: CE File #1194-1). There is no evidence that this addition was ever built.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The high open-bay floor plan allowing the crane and hoist system, and the large metal equipment roll-up doors remain as key design elements.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Buildings 1193 and 1194 remain in an unmodified and isolated setting.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Nearly all of the historic materials used to construct this building remain visible.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two doors have been replaced. All windows appear to be original. Interior partitions at the northwest corner divide the original floor plan.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Although retaining its original open floor plan, this building is currently used for storage of modern equipment.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

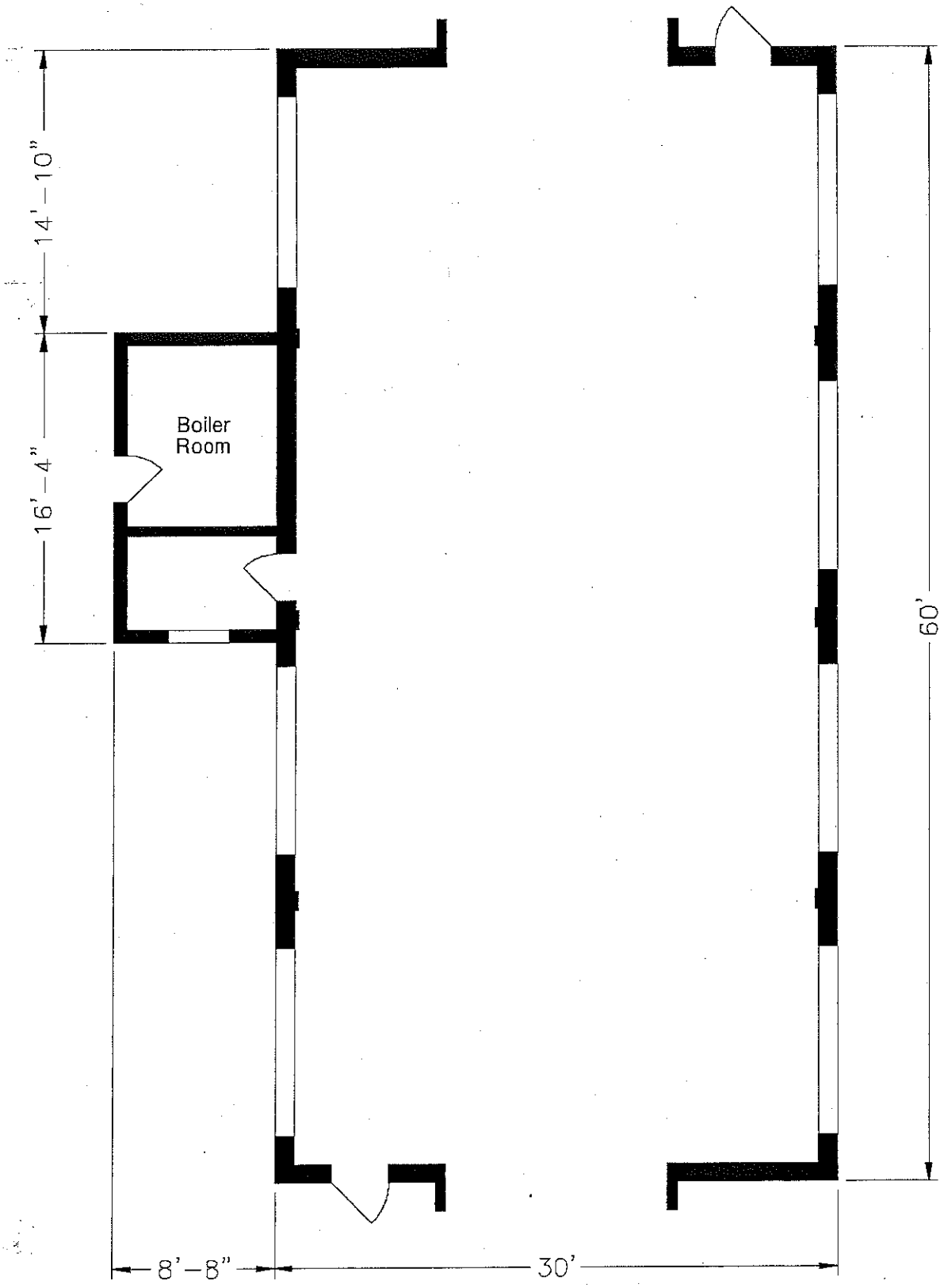
Comments: The open floor plan, isolated setting, hoist system, and nearby continuity check stand (Building 1193) contribute to this building's integrity of association.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #3-Photo #31**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1195-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1194** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1196

This building was constructed in 1956. It originally built for missile assembly, but is now in communications equipment storage.
The original facilities consisted of:

- Toilet
- Lavatory

These facilities were replaced in 1975 with:

- Toilet
- Urinal
- Lavatory

An on site inspection for this building was done on 4 Dec 07 with the current facility manager Sgt Lander. The information gathered from this inspection was that there were not any floor drains located within the building. In the past it was used for TAC can and for the past ten years it has been used for storage.
Attachment 55d shows where the leach field for Bldg. 1196 was located in 1984.

Figure 6: Picture of Bldg. 1196

INACTIVE SEPTIC SYSTEMS

BUILDING 1199

This building was constructed in 1957. It was originally built as a rocket fuel laboratory. In 1987 it was converted to the Security Forces Kennel.
As the fuels laboratory, it contained:

- Toilet
- Urinal
- Lavatory
- Shower

After conversion to the kennel, the facilities were changed to:

- Toilet
- Urinal
- Stainless Steel Sink

During the investigation stage of the project there were drawings found for building 1199. Attachment 12 and 13 are of the Site Plan, the Sewer Isometric, the Plumbing Plan and the Floor Plan.

Along with the drawings that were found an on site inspection was completed on 29 Nov 07 with the current facility manager, SSgt Gilmore. A new Security Forces Kennel area has been built and now the building is currently being used to house animals until they can be transferred to Alamogordo Animal Control.

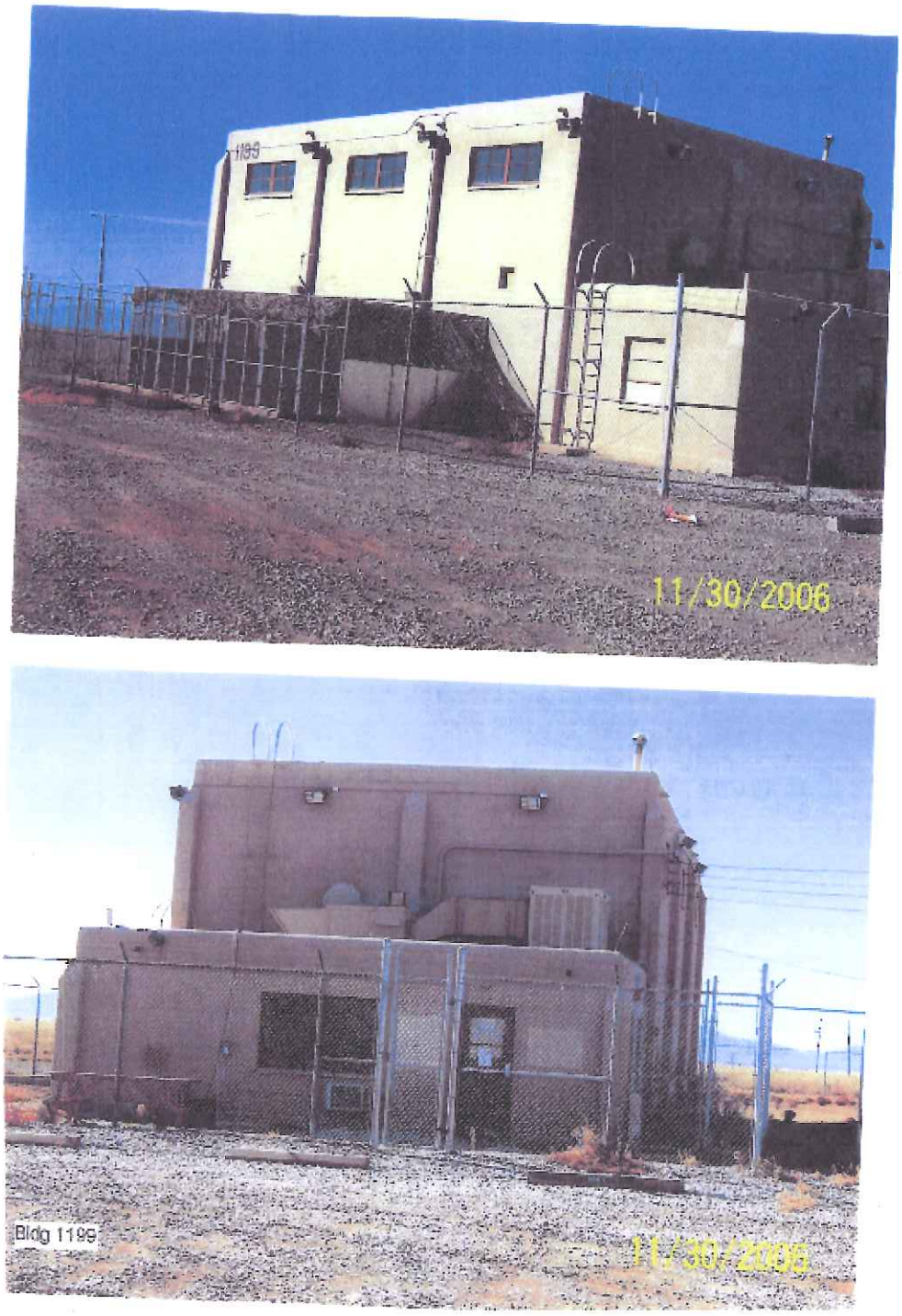


Figure 7: Pictures of Bldg 1199

INACTIVE SEPTIC SYSTEMS

BUILDING 1200

Specifications and History: See "Cold War Survey".

Three drawings were found for this building. These drawings show the Plumbing Floor Plan (Attachment 14), a Floor Plan (Attachment 15) and the Septic Tank and Drain Field (Attachment 16).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab, Medical (VACANT).
Historic: Space Biology Laboratory.
Street Address: 841 Douglas Road, HAFB, 88330-7823.

Building Number: 1200

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [ ] Needs maintenance [x] Deteriorated [ ] Archaeological

Comments: Building 1200 is abandoned, and showing signs of deterioration.

Degree of Alteration: [ ] None [ ] Minor [x] Moderate [ ] Major

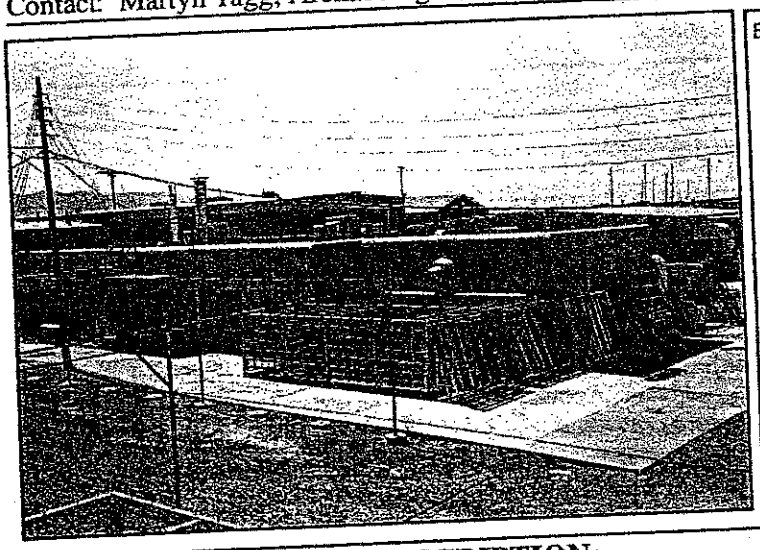
Comments: Alterations are architectural rather than structural.

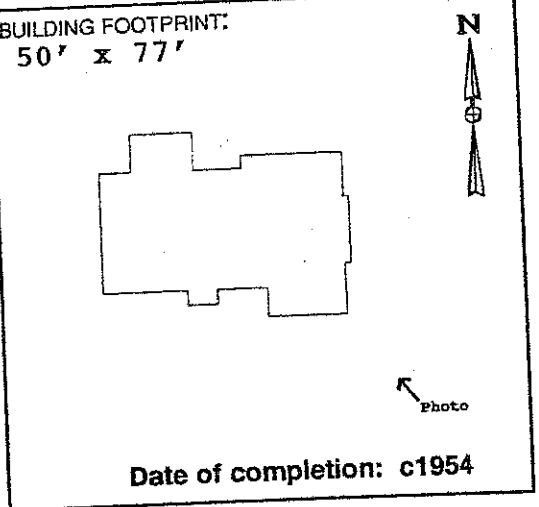
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1200 no longer retains historic integrity. See Section VI.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1954

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II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1200 is a rectangular, single-story, flat-roofed concrete masonry unit (CMU) building constructed as one of several laboratories dedicated to important aeromedical research using both animals and humans. None of the construction drawings were correctly stamped "As-built." According to Real Property Accountable Record/1200, the estimated date of construction is 1954. Subsequent improvements documented in CE File drawer #1200 include an addition to the medical lab (c1958), a covered passageway added to the boiler room (c1957), and a frame wall addition to the surgery room (c1957). Neither the builder nor the architect is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1200; Field visit Summer 1995.

Current Function: Vacant.

Original Function: Space Biology laboratory/Animal experimentation.

Interim Functions: Animal experimentation/Storage.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1200-1 (c1953).

Foundation: Concrete wall footings. Concrete slab on fill.

Exterior walls: Painted concrete masonry units (CMU).

Roof: BUR on concrete deck, supported by metal lathe and steel bar joists.

Notable interior features, including machinery:

Originally used as a medical laboratory, with work tables, work benches, built-in lockers, cabinets, operating tables, x-ray tables, etc.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:

274

One room is currently being used for storage. All medical and laboratory equipment has been removed.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Due to extensive alterations to the exterior, Building 1200 no longer retains historic integrity. Recommend, however, that this building be considered as a contributing feature in a basewide early Cold War National Register of Historic Places Multiple Property nomination.

VII. ASSOCIATED BUILDINGS:

Building 1200 was an integral part of Holloman's aeromedical facilities, including Buildings 1201, 1202, 1203, 1204, 1205, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Since its original construction c1954, Building 1200 has been used as a laboratory and medical facility for a wide variety of research animals, including trout, black bear, dogs, mice, and chimpanzees. Although currently abandoned, this building featured a lead-lined x-ray room, an autopsy room, an observation room, a surgery room, a dark room, and animal pens (c1954: CE File #1200-1). Built-in steel lockers, metal cages, x-ray tables, work benches, food bins, operating tables, scrub sinks, surgical lamps, sterilizers, etc. have been removed. Two exterior doors have been blocked in, and thirteen exterior windows have been blocked in. One exterior door and one exterior window have been added. Interior walls have been added, removed, or relocated. A storage room has been added to the south elevation. Animal cages remain at the west elevation. The presence of dead rodents, foul odors, torn pipe and duct insulation (possible containing asbestos) and peeling paint (possible lead-based) represent hazards to health and safety. Because of the unique and important nature of the research conducted here, recommend that this building be nominated as a contributing feature as part of an HAFB early Cold War National Register Multiple Property nomination.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?
[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.
Comments: The building has been located at its present location since c1954.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?
[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact
Comments: Most of the original doors and windows have been removed. All of the equipment has been removed. Most of the original finishes have been obscured.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting
To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting
Comments: Continues to be situated in an isolated setting with the other Aeromedical facilities.

Materials: To what extent have the original materials used to construct this structure been retained?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Elevations have changed due to modified openings, an addition, and a covered passageway. Interior wainscot and cornice removed, wall tile added.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Exterior walls and cages remain intact. Some architectural features remain. Most of the original interior workmanship has been lost.

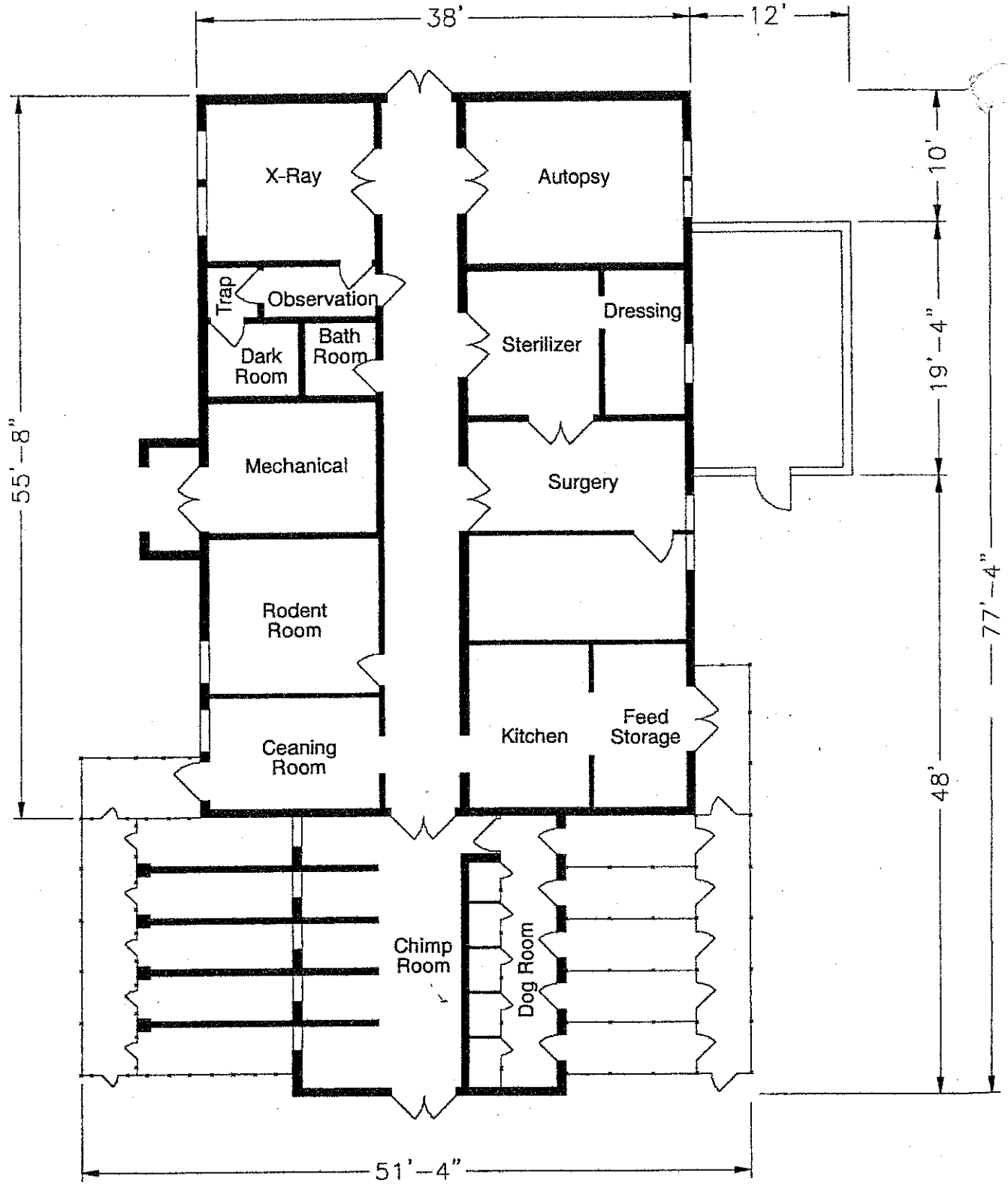
Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?
[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity
Comments: Building 1200 continues to be situated within the compound set aside for animal research. Chimpanzee research continues today in nearby buildings.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?
[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity
Comments: Although all of the equipment has been removed, this building still demonstrates a link with its past by virtue of its setting, the odors, and the animal cages.

X. FURTHER INFORMATION:

Surveyed By:
Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #94**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1200-1 (c1954)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1200** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

BUILDING 1201

Specifications and History: See "Cold War Survey"

Seven drawings were found for this building. These drawings show the Septic Tank and Absorbent Area Layout, Isometric Sewer Layout, Septic Tank Plan and Septic Tank Elevation (Attachment 17), Floor Plan (Attachment 18), Layout Plan (Attachment 19) and Systematic-Waste System (Attachment 20).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab Medical.
Historic: Aero. Medical Field Lab.
Street Address: 821 Douglas Road, HAFB, 88330-7823.

Building Number: 1201

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Structurally intact. In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

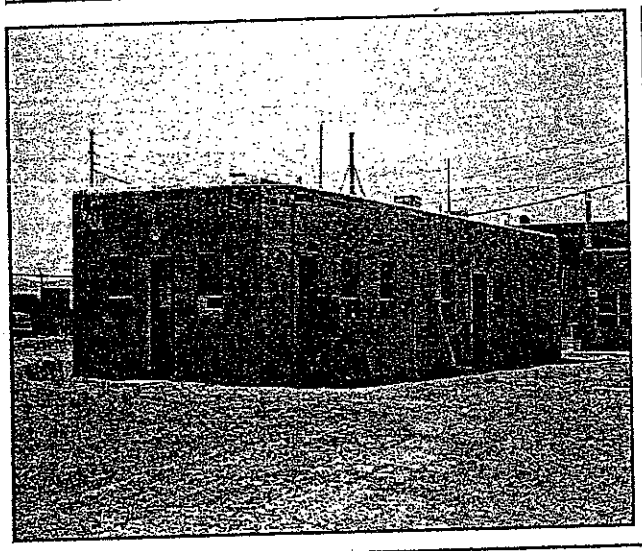
Comments: Mortuary/autopsy room added as subsequent improvement c1958.

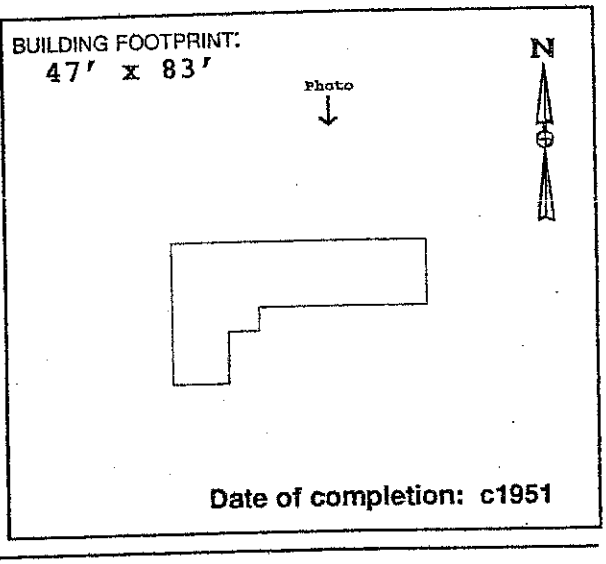
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible under Criteria A and/or C at a national level.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1951

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1201 is an "L-shaped", single-story, flat-roofed, building constructed primarily using painted 8" structural clay tile and exhibiting asymmetrical door and window placement. Animal cages occupy the west elevation. Real Property Accountable Record/1201 indicates that this science laboratory was constructed c1951. The construction drawings consulted were stamped "As-Built," although no date was given. Both the architect and builder are unknown.

At least two structural modifications may be viewed as subsequent improvements to the original building, including the addition of a Mortuary/ Autopsy Room (c1958: CE File #1201-4), and the addition of a rooftop observation deck (c1952: CE File #1201-5).

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1201.

Current Function: Carpentry shop; Employee break room; Office space.

Original Function: Aerospace Medical Lab; Animal experimentation.

Interim Functions: "SC Lab Human Eng" (n.d.); "SC Lab Med (c1968).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1201-1 (c1951).

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted structural clay tile.

Roof: Built-up roof w/ gravel on sheeting, supported by 2x12 wood joists.

Notable interior features, including machinery:

Fixed chain link cages, lab tables, equipment tables, work tables, wood storage bins, sterilizer, incubator.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL: (Based on field visit Summer 1995

[c1958 SUBSEQUENT IMPROVEMENT--MORTUARY/AUTOPSY]:

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted cement masonry unit (CMU).

Roof: 5-Ply built up roof on concrete slab. Steel joists.

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Notable interior features, including machinery:

Washer and dryer, kitchenette, tool room, table saw, furniture, lockers.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1201 is eligible to the National Register under Criteria A and/or C at a national level of significance for its vital role in early aeromedical research in support of the early Cold War space exploration mission.

VII. ASSOCIATED BUILDINGS:

Building 1201 was associated with the other Aeromedical facilities, including Buildings 1200, 1202, 1203, 1204, 1205, 1206, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1201 retains historic integrity as far as the structure itself goes. Very little physical evidence remains of this structure's original use as an animal laboratory. The cages have been removed. Two interior walls with doors have been added. One interior wall has been removed. Service sinks, work tables, wooden bins, an incubator, and other lab support items shown on c1951 construction drawings have been removed. An area of the original roof approx. 10' x 13' was reinforced with three inches of concrete for observation deck c1952 (CE File #1201-5). A mortuary/autopsy room was added c1958. These additions may be viewed as early improvements, and do not diminish Building 1201's historic integrity. Drawings itemize a "2-body" mortuary room, an autopsy table, a band saw, cabinets, a sterilizer, a photography area, and other laboratory equipment. This equipment has been removed. This room currently serves as a lounge area for employees. Due to the important research conducted here in support of this nation's space program, further research is warranted. Recommend that Building 1201 be included in a Cold War-era Multiple Property nomination. Suggested routine maintenance: This building is showing the signs of long-term neglect. Fill the stress cracks at the exterior corners. Scrape and paint exterior walls. Replace window glass and door hardware as needed.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Continues to be situated in an isolated compound.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Original structure essentially intact. Interior lab equipment and cages removed.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Enclosed by chain link fence topped with barbed wire, along with other research facilities. Chimpanzee research continues in nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Clay tile walls still intact. Some glass block windows remain. Some glass block windows blocked in when addition constructed. Floor tiles removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Roof, walls, and exterior openings remain essentially the same. The east elevation changed due to an early addition. Interior partitions, openings, and finishes have changed.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Historic photographs show that the natural, historic, and aesthetic character of Building 1201 has been retained.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

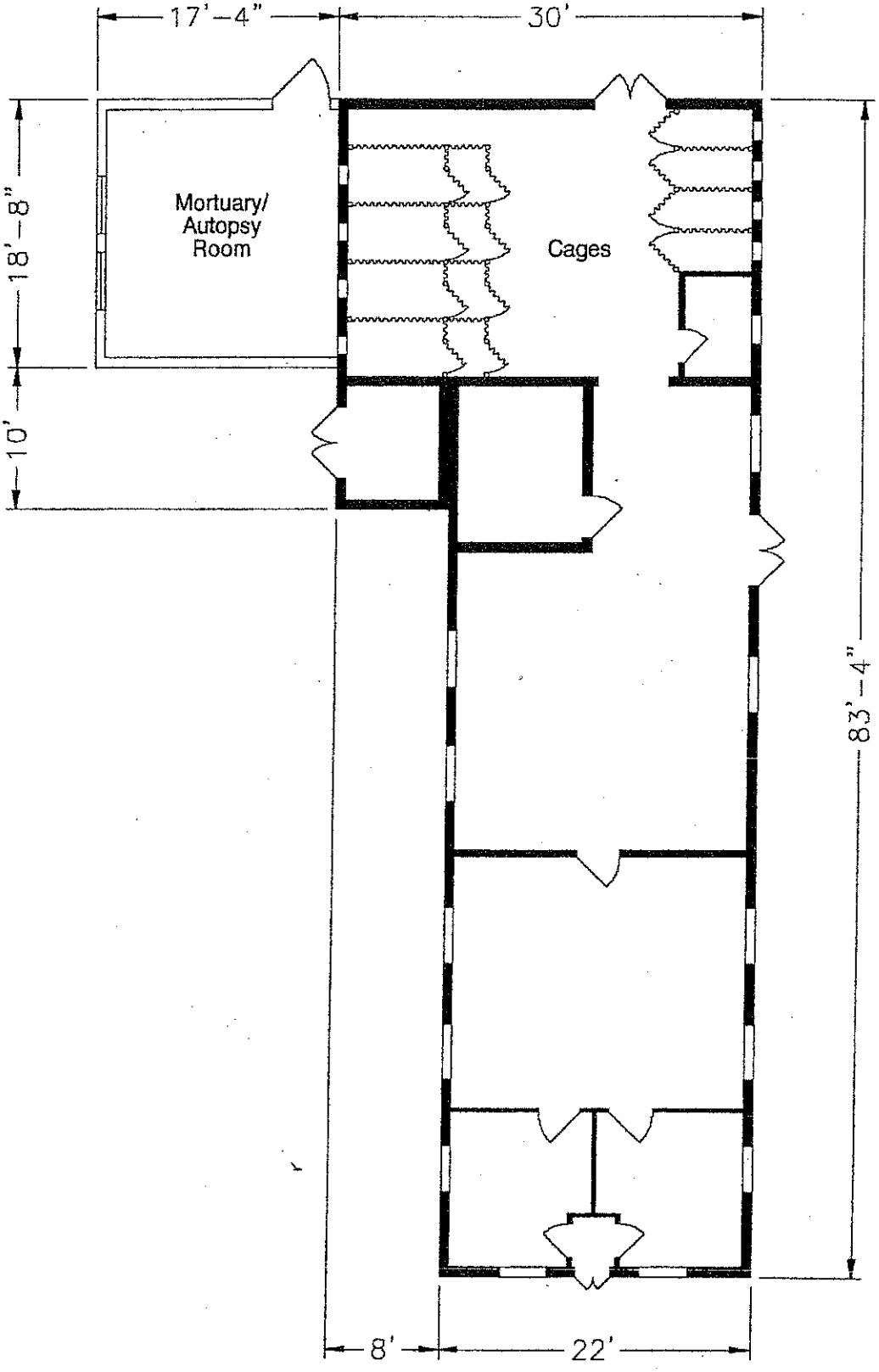
Comments: Building 1201 retains a visible link with its period of significance.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #91**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1995**



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Source: CE File #1201-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1201** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

Buildings 1219, 1221, 1235 and 1239
An on site inspection was completed on 20 Dec 07 with the current facilities manager, TSgt Pote, he has been the facilities manager for the past nine years. During the inspection it was discovered that there are sink holes on all leach fields in the compound. All buildings in this compound have separate drains for the bathrooms. All buildings are also currently connect to the base sewer system.
Attachment 55d shows the leach field location for Buildings 1219, 1221, 1235 and 1239.

BUILDING 1219

This building is the Administrative Offices for the Munitions Maintenance Squadron. It was constructed in 1985 and covers 4476 SF.
There are Men's and Women's Bathrooms that discharged into two (2) septic tanks prior to the installation of a sewer main that discharges to the Base Waste Water Treatment Plant.

INACTIVE SEPTIC SYSTEMS

Building 1221

This building is in the Ammo Depot and was originally constructed for ammunition storage. It was later switched to store inert munitions.
The building was constructed in 1983 and covers 2857 SF.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan (Attachment 21), Floor Plan (Attachment 22), Partial Plan (Attachment 23), Septic Tank Details and Sewage Disposal System (Attachment 24) and a Profile of Sewer Line Septic Tank and Disposal Field (Attachment 25).

INACTIVE SEPTIC SYSTEMS

BUILDING 1226

This is a munitions maintenance shop building constructed in 1985. It has 2945 SF of floor space.
Facilities installed include:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Utilities Plan (Attachment 26), Plumbing Demolition Plan (Attachment 27), Plumbing and HVAC Plan (Attachment 28) and Waster/Water Piping Detail (Attachment 29).

In Figure 8 on the following page it can clearly be seen where the leach field is in relation to where building 1226. This is the leach field for building 1219, 1221, 1235 and 1239 as well. In Attachment 46 (a map showing many of the building on Holloman AFB) it can be seen where building 1226 is in relation to these building.

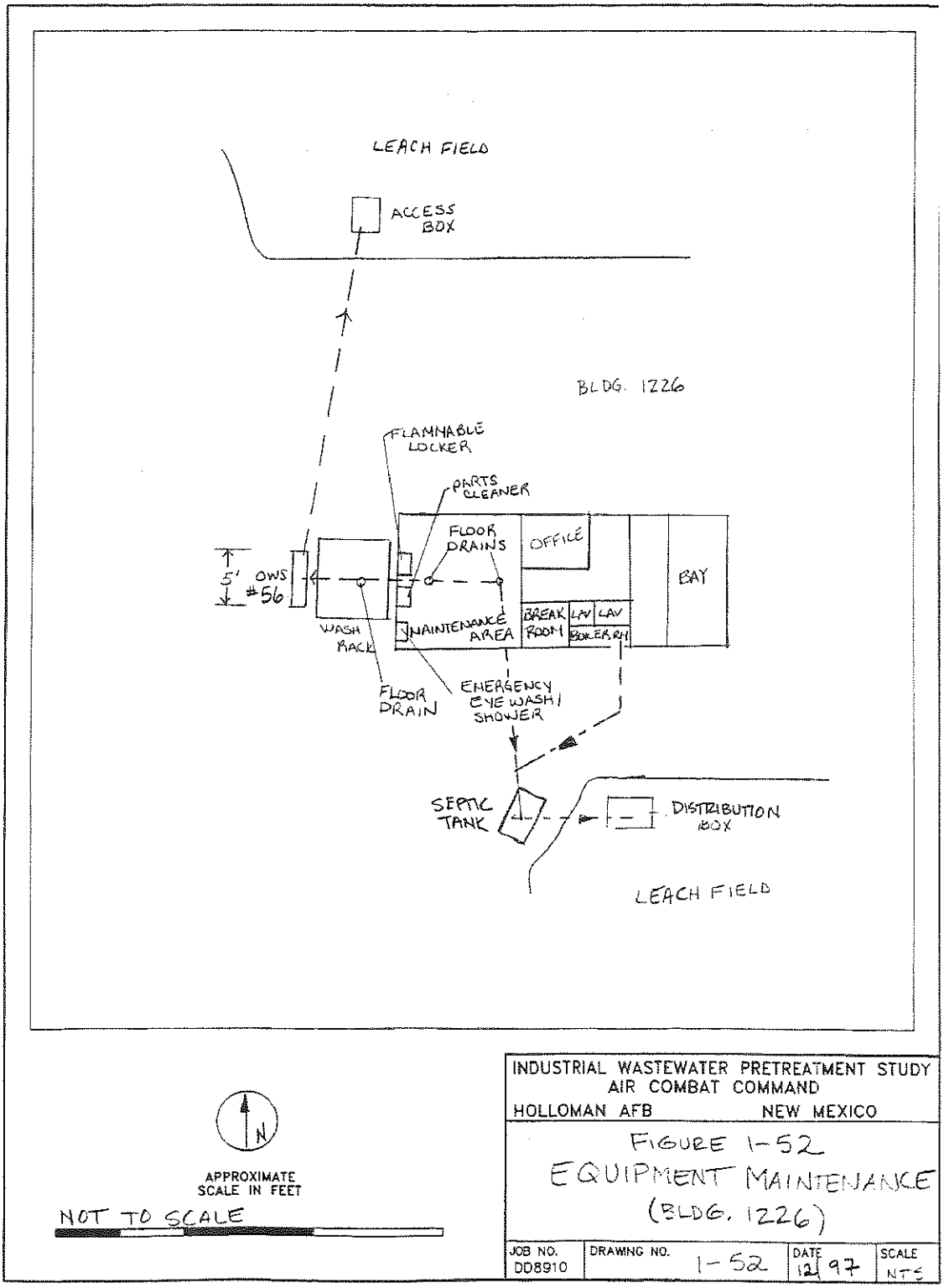

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Figure 8: Drawing of Leach field

INACTIVE SEPTIC SYSTEMS

BUILDING 1235

This building was constructed in 1964 and contains 3000 SF of floor space.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, a drawing for this building was also located. This drawing (Attachment 30) shows the Site Plan, Septic Tank Details and Sewer Clean Out.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST

INACTIVE SEPTIC SYSTEMS

BUILDING 1239

This is another building in the Ammo Depot. It was constructed in 1971 and contains 1920 SF.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Urinal
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan, Septic Tank Details, Utility Plan (Attachment 31), Floor Plan (Attachment 32), Grading Plan (Attachment 33) and Lavatory Detail (Attachment 34).

INACTIVE SEPTIC SYSTEMS

BUILDING 1250

This building was constructed in 1957 and contains 2890 SF.
It was originally a water pumping station. In 1985 it was changed into a storage facility. As part of the change in service the bathroom facilities were removed. Currently it has a large infestation of vectors and it is unsafe to go inside. The POC for this building is Mr. Chuck Price.
The original facilities consisted of:

- Toilet
- Lavatory
- Floor drains for the water pumps

INACTIVE SEPTIC SYSTEMS

BUILDING 1251

This building was constructed in 1965 and contains 1300 SF.
In the records it is listed as a Research and Testing Shop. It currently has a large infestation of vectors, therefore it is not safe to go inside. The building has been vacant since the mid 90's. The point of contact for this building is Mrs. Eisele.
It contains the following facilities:

- Toilet
- Lavatory

INACTIVE SEPTIC SYSTEMS

BUILDING 1269

This building was constructed in 1966 and contains 3262 SF.
The original service was a Medical Science Laboratory. It has been relegated to a storage facility.
The facilities consisted of:

- Toilet
- Lavatory
- Kitchen Sink with Garbage Disposal

Site Specific Contingency Plan: See Attachment 1

Max. Spill Quantity (gal): 55

Chemical	Container Type
Benzene	NA
Acetonitrile	

REMOVED SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	1102	1952	6'x4'x8'10"	2500
2	1103	1948	7'x9'x3'2"	1412
3	1108	1958	6'x9'6"x6'3"	750
4	1119			
5	1150	1953	4'x9'x6'3"	2500
6	1154			
7	1166	1960		450
8	1175	1949	5'1"x10'4"x6'10"	2970
9	1176	1959		640
10	1265	1992		1200
11	1173			

REMOVED SEPTIC SYSTEMS

BUILDING 1102

Specifications and History: See "Cold War Survey." More information can be seen in the drawings. The drawings that have been found for this building are as follows the Grading Plan (Attachment 35), Septic Tank Details and Boring Log Results (Attachment 36), Leaching Well and Cover Details and Sewer Clean Out (Attachment 37).

Attachment 55c shows where the leach field was located for this building in 1984.

This building has the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Missile Radar Station.
Historic: Radar Triangulation: King I.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1102

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

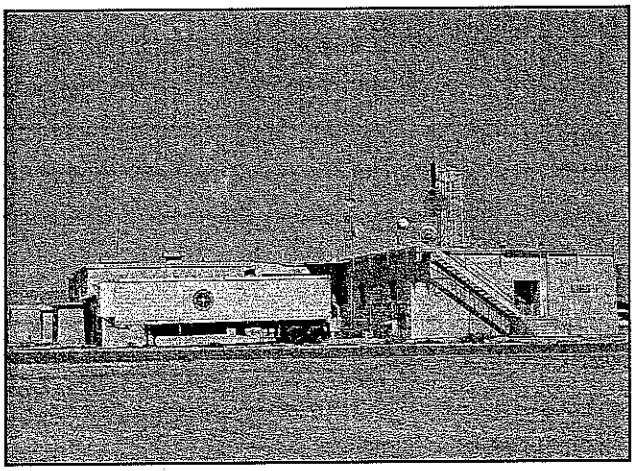
Comments: Essential structural and architectural features remain intact.

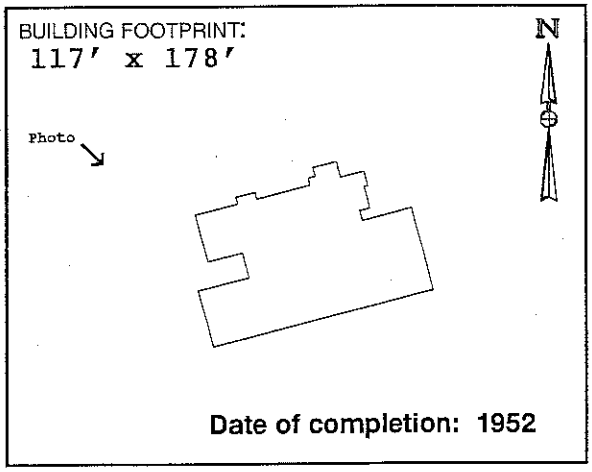
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Recommend listing as part of a Cold War Multiple Property.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1102 is a one-story concrete masonry unit, multi-shaped building with a central corridor running east-west the entire length and single rooms flanking both sides of the corridor. Original footprint shows primarily rectangular shape with a central projecting core. This core is a large open room with an upper balcony around its perimeter. Construction of the original building was completed in 1952, according to "As-built" drawings in CE File #1102-1. Surveillance display room added in 1969 (CE File #1102-1). It is unclear when north elevation additions constructed, although information in Real Property Accountable Record/1102 date the additions as being post-1970. The architect for this project was W. C. Kruger (Santa Fe, NM). The builder is unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1102.

Current Function: Telemetry and Optics. Altitude measurements.

Original Function: Missile Instrumentation Station; Mission Control.

Interim Functions: Missile Radar Station.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1102-1 (c1952).

Foundation: Concrete footing and foundation wall. Column spread footing.

Exterior walls: Concrete masonry units (CMU).

Roof: Bituminous concrete over built-up roof, ltweight concrete, supported by one-way concrete slab using concrete beams and steel beams encased in concrete.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

380

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Eligible under Criteria A and/or C at a national level of significance for important role in early Cold War-era missile and High Speed Test Track mission control and tracking. Further research recommended.

VII. ASSOCIATED BUILDINGS:

Building 1102 supported all missions at White Sands Missile Range and at Holloman Air Force Base until Building 300 and possibly 1527 at White Sands were constructed.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1102 continues to operate as a mission control building, with mostly optics and telemetry functions. The Flight and Instrument Control Room, and the Surveillance Radar rooms are vacant. Originally, missiles were fired using an analog boards (mechanical) system. When operations changed to a digital system in c1978, support moved from the central instrument control room to the north addition off of this room. Nearly all of the original interior finishes remain unchanged.

Suggested routine maintenance: Scrape, prime, and paint all block and concrete surfaces. Remove vegetation and rusted pipes by gas meter. Fill depressions at foundation, and regrade using gravel to promote positive drainage. Fill holes at concrete stoops. Replace wood bumper at dock using similar-sized lumber. Secure panel covers on abandoned electrical panels. Enclose live connections in junction boxes. Scrape, prime, and paint metal stairs. Reattach stair nose treads. Remove miscellaneous debris from building perimeter.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Still situated at the northeast corner of the intersection of Tula Peak Road, and Douglas Road.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The original floor plan remains intact.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Continues to be situated at the intersection of two roads in an isolated setting with few nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Most all original materials have been retained at both the exterior and the interior.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: All original exterior and interior room finishes remain visible. At the south elevation, one window is blocked, one window has been replaced with a door, and the door at the loading dock has been replaced. Most of the north elevation is obscured by the addition of an operations room.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1102 continues to support limited mission control operations.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

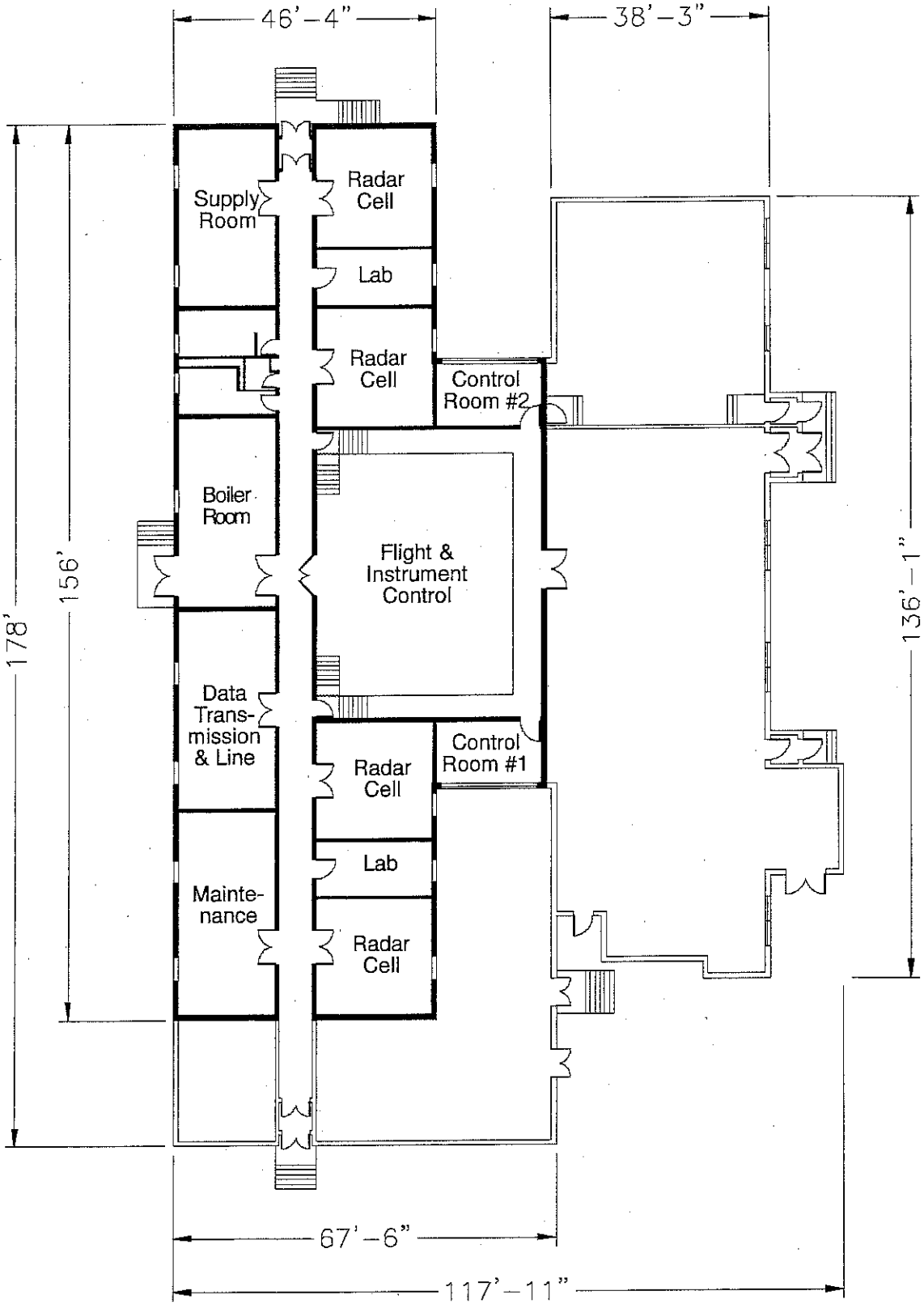
Comments: Building 1102 retains an evident link with its aesthetic and functional historic character.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #49**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1102-1 (c1952)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1102** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-6401* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1103

Specifications and History: See "Cold War Survey" the Layout Plan (Attachment 38) has also been provided.

Attachment 55c shows where the leach field was located for this building in 1984.

Facilities: This building contains the following facilities.

- Tiolets-2
- Urinals-2
- Lavatories-3
- Service Sinks-3

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Timing.
Historic: Telemetering Building.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1103

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance only.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

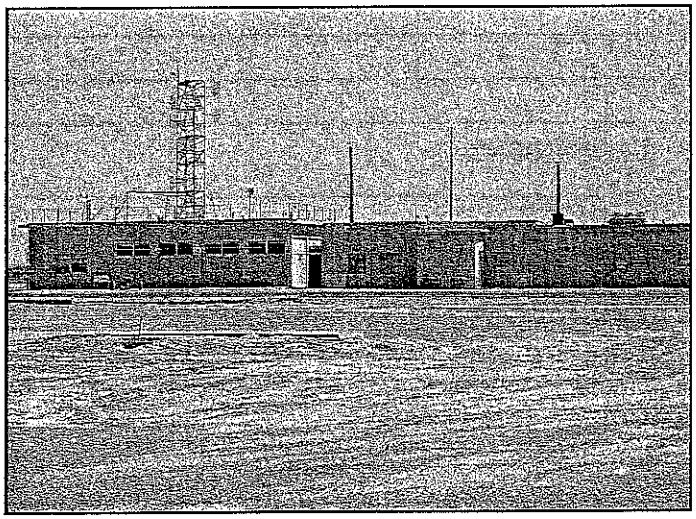
Comments: Few alterations since early improvements.

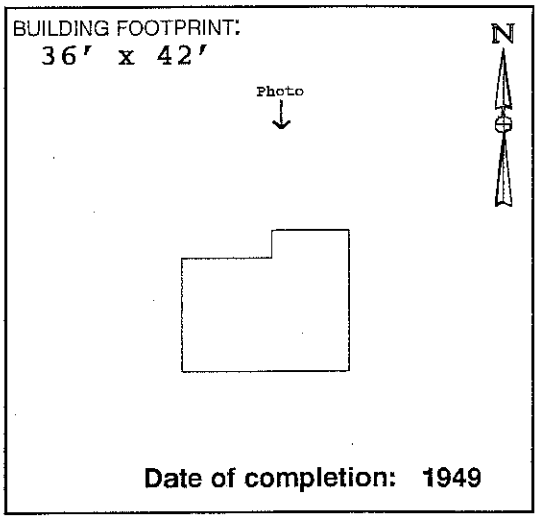
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Research recommended to determine historic use. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1103 is a one-story rectangular building with concrete masonry unit walls, and a flat roof. The original building was completed in 1949, according to "As-built" drawings located in CE File #1103-1. This original construction is centrally located, flanked to the east and west by subsequent additions. Real Property Accountable Record/1103 documents the addition of 2,930 square feet to the original building with the notation "Subsequent Improvements thru May 57." One or both additions to the original building may therefore be considered to be subsequent improvements, rather than additions that compromise historic integrity. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE: (Personal communication with Building 1103 personnel)

Current Function: (East end) Leased by WSMR to transmit mission timings.

Current Function: (West end) Unknown.

Original Function: Telemetering station for data collection of Range missions.

Interim Functions: Real Property Accountable Record/1103: "Communications CTR" (c1962); "Telecom Cen" (c1971); "Comm Fclty" (c1980); "Elec Rsch Rdr" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1103-2 (1967); CE File #1103-1 (1949).

Foundation: Concrete wall footing.

Exterior walls: Painted concrete masonry units (CMU).

Roof: Built-up roof on wood sheathing and 2 x 8 wood joists.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Although perhaps not meeting the "exceptional importance" stipulation imposed on buildings constructed within the last fifty years, Building 1103 may be eligbile for the National Register under Criterion A at a regional or national level in the year 1999. If further research determines that Building 1103 is not eligible as an individual property, consideration should be given to its eligibility as a contributing feature in a Cold War Multiple Property submission for its support of early Cold War-era test launches.

VII. ASSOCIATED BUILDINGS:

Building 1103 was associated during its historic period of significance with Building 1102, mobile data collection vans, and Building 300 at White Sands Missile Range.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1103 appears very different today from depictions on "As-built" drawings dated 1949. It is unclear whether additions to the east and west ends of the original building represent early improvements to the original building, or whether these additions represent later construction that has compromised the historic integrity of the original building. Information obtained from Real Property Record/1103 and field visits seems to indicate that the additions represent early improvements to the original building. If so, Building 1103 retains historic integrity. Further research is needed to verify the construction sequence, and to verify what early Cold War-era research activities were supported by Building 1103. Currently, Building 1103 is leased by the White Sands Missile Range. Aside from minor partitioning at the telemetering room, the original floor plan of the original building shows no alterations. Wood posts (6 x 6) that appear on original drawings to support the roof girders have been removed.

Suggested routine maintenance: Repair, or replace in kind, the exterior wood architectural features, including the soffit, fascia, wood doors, and louvers. Patch spalling concrete at foundation. Remove vegetation at roof.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Original telemetering room is now used as spare equipment storage.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Earlier location plans indicate three utility buildings situated in a row next to Building 1103 to the east. These buildings have been removed. Continues to be set in a somewhat isolated setting, in the vicinity of King-I.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Unable to access some rooms. Those rooms that were accessed, however, appear to have most of the original materials intact. A brick chimney and a metal stack have been removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original windows at north elevation have been covered up at the interior. The telemetering room has been partitioned (reversible).

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity

Comments: Building 1103 personnel are actively engaged in serving as a timing link for White Sands Missile Range tests.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

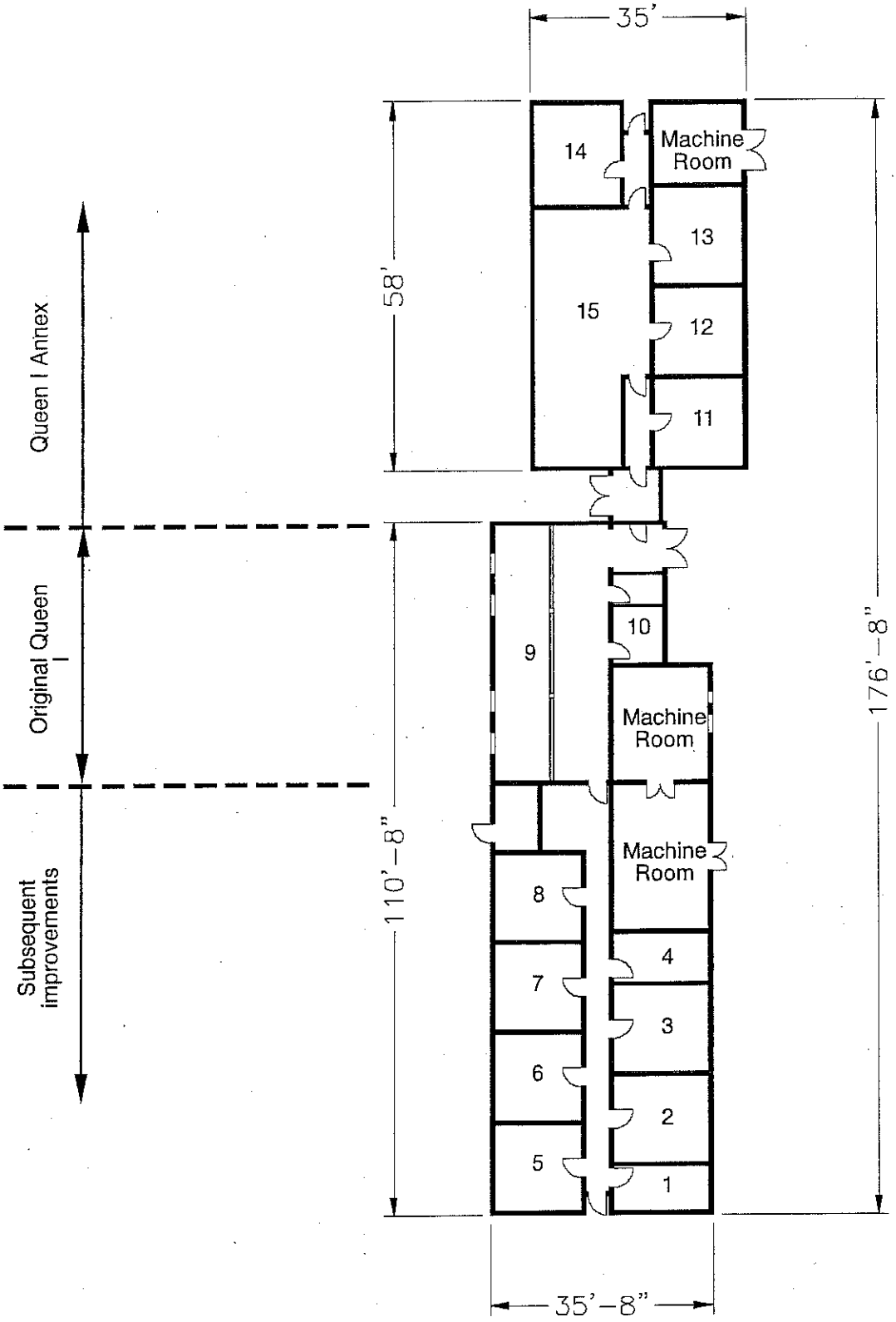
Comments: Building 1103 continues to provide support to the White Sands Missile Range.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #47**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: Dynalectron *Facilities Handbook*, c1964.

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1103** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1108

This building was constructed in 1958 and contains 2626 SF of floor space.
The building was originally built to serve as the telephone exchange. In 1980 it was retitled as a communications facility.
The building contains the following facilities:

- Toilet
- Lavatory
- Janitorial Sink

The drawings provided (Attachment 39-40) show a Utility Plot Plan, Septic Tank Details, Sewer Clean Out, Toilet Room Details and Plan Details.

Attachment 55e shows where the leach field was located for this building in 1984.

Site Specific Contingency Plan: See Attachment 1 and 2

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate into local area on ground

Tank location: North of facility

Fuel Flow - North

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST
MOGAS	250 gal each/ 2 /AST

REMOVED SEPTIC SYSTEMS

BUILDING 1119

This is an Army owned building that contains 2224 SF of floor space. Use and maintenance of the building was transferred to the Air Force in 2005. Prior to the Air Force taking possession the Army had delegated the building to the GSA for use as a vehicle maintenance shop. Once the Air Force took over, the building changed service to an electrical shop and storage facility.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
Diesel	250 gal ea/ 3 /AST
MOGAS	250 gal ea/ 2 /AST
Diesel	750 gal ea/ 3 /AST

Figure 9: Picture of Bldg 1119

REMOVED SEPTIC SYSTEMS

BUILDING 1150

This is also an Army owned building and therefore details are lacking from Holloman's records. The building has 2844 SF.
The original service is unknown, but since the Air Force started using the building it has been used as storage space.
It contains the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 9: Drawing of Bldg 1150

REMOVED SEPTIC SYSTEMS

BUILDING 1154

This is an Army owned building and there is no information in Holloman's files pertaining to this building.

Attachment 55c shows where the leach field was located for this building in 1984.

REMOVED SEPTIC SYSTEMS

BUILDING 1166

This building was constructed in 1960 and contains 4955 SF. The structure is a Test Track Shop/Storage Building known as the "Break Setter Building".
The facilities include:

- Toilets-2
- Urinal
- Lavatory
- Shower

Attachment 41 is a drawing showing the sewer layout and the septic tank details.

Attachment 55c shows where the leach field was located for this building in 1984.

Site Specific Contingency Action: See Attachment 3

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate in local area on ground; if full tank or drum spilled' the substance may reach open ditch.

Material Compatibility: No material incompatibilities

Chemical	Container Type
Oil/Water Separator Waste	500 gal/ 1 / UST

Figure 10: Picture of Bldg. 1166

REMOVED SEPTIC SYSTEMS

BUILDING 1175

Specifications and History: See "Cold War Survey"
Facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

In Attachments 42-44 a trench pit, the toilet room details, the trench junction to UPS, the sanitary sewer manhole and water and sewer piping can be found for Bldg 1175.

Attachment 55c shows where the leach field was located for this building in 1984.

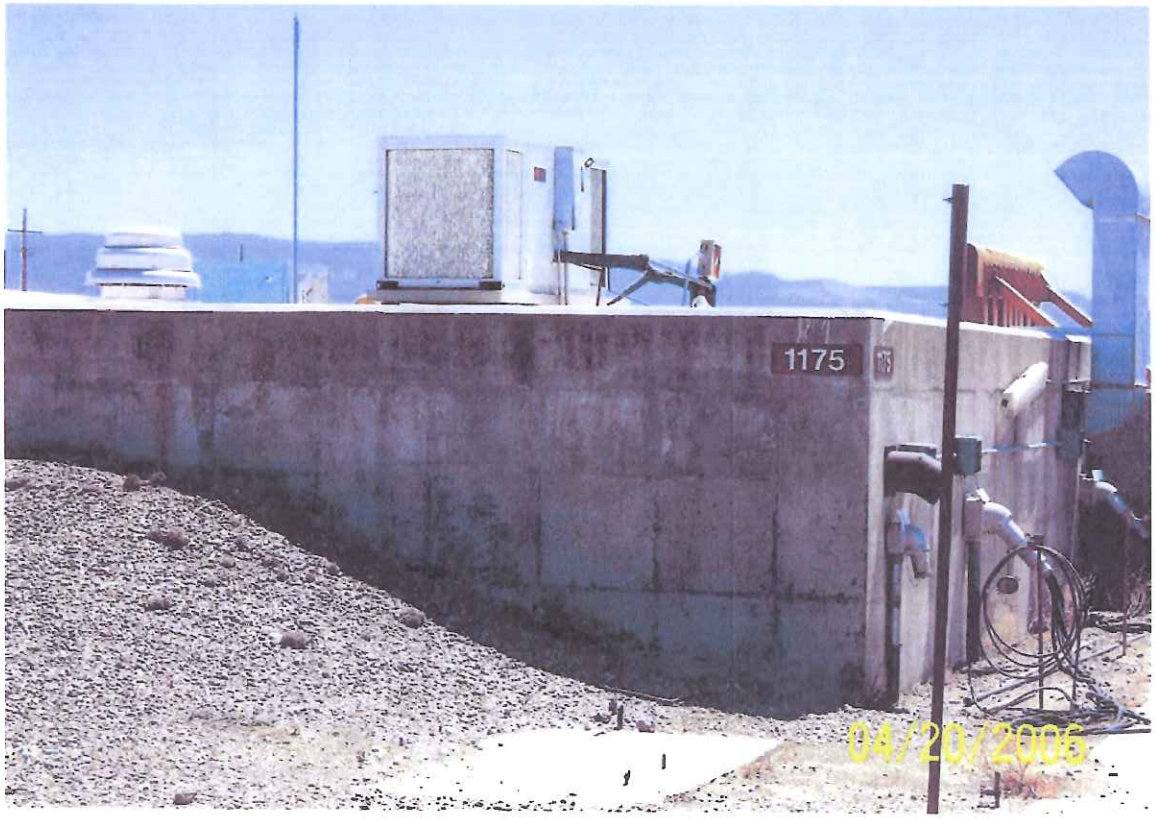


Figure 11: Picture of Bldg 1175

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Blockhouse--"Alpha".
Historic: Blockhouse--"Alpha".
Street Address: 1656 Test Track Rd., HAFB, 88330-7848.

Building Number: 1175

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1175 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

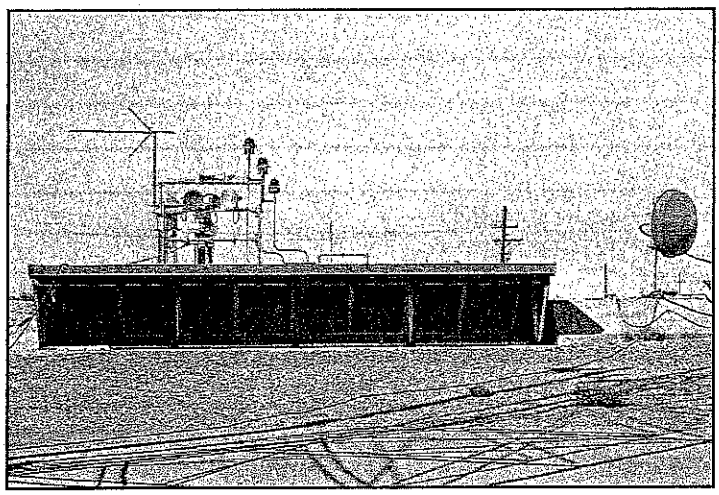
Comments: Modernization at interior to enable continued Test Track use.

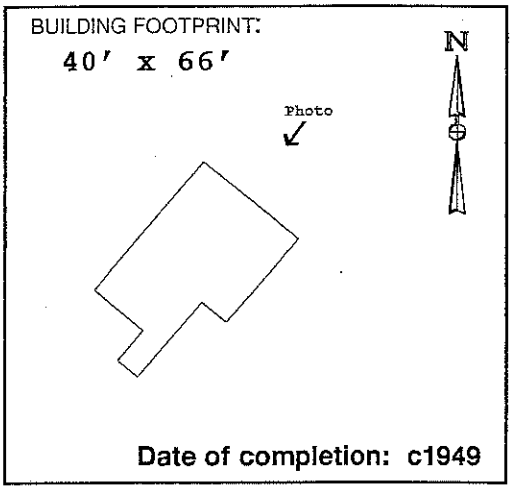
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible for the National Register under Criteria A and/or C.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1175 is an irregularly shaped, one-story concrete structure, built mostly below grade. The building is accessed by a ramp leading down to double doors at the southwest elevation. These doors access the original launch control room constructed in c1949. This entrance, three entrances off of the ramp, and windows facing the track (northeast) are the only visible openings. A 15′ x 32′-6″ addition was constructed at the northwest elevation in 1960 (CE File #1175-2). Another addition, adjacent to northwest side of ramp was completed in 1981 (CE File #1175-3). The ramp extension was also constructed at this time. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1175; CE File #1175-1 (c1949).

Current Function: Launch control facility, High Speed Test Track.

Original Function: Launch control facility, High Speed Test Track.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1175-1 (c1949); CE File #1175 (c1980).

Foundation: Concrete footings.

Exterior walls: Reinforced concrete.

Roof: 3-foot thick reinforced concrete.

Notable interior features, including machinery:
A long row of thick blast-proof windows faces the track to the northeast.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

366

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

"Alpha" Block house Building 1175 is one of the original High Speed Test Track support facilities, constructed c1949 to provide launch control. Recommend that Building 1175 be nominated under Criteria A and C as part of a basewide early Cold War Multiple Property listing.

VII. ASSOCIATED BUILDINGS:

Building 1175 operated, and continues to operate, in support of the high speed test track launching activities, along with Buildings 1162, 1163, 1161, 1645, and the Horizontal Test Stand facility (Buildings 1159 and 1160).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1175 retains historic integrity. Due to its national level of significance under Criteria A and C, recommend that Building 1175 be listed along with the other test track support buildings as part of a Multiple Property nomination to the National Register of Historic Places.

Subsequent improvements to the original Building 1175 augmented the original design and function as a launch control facility for important research conducted at the high speed test track. The interior was renovated in 1984 (CE File #1175-4). Although this renovation obscures original interior finishes, Building 1175 as a whole retains historic integrity of location, design, setting, workmanship, materials, feeling, and association. Of interest to future researchers may be the dramatic changes in computer technology which have occurred since the construction of Alpha Blockhouse: Computers which at that time required several rooms to house, now occupy considerably less space. Launch control operations continue at Alpha Blockhouse, although rooms designed to hold early equipment are virtually empty.

Suggested routine maintenance: Repair bond beam where steel is exposed. Remove vegetation at exterior embankments. Remove debris at front walkway.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Subsequent improvements to the original floor plan added to Building 1175's design and function as a launch control facility.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Except for the construction of smaller buildings in the vicinity, the original setting of Building 1175 near the test track launch pad has been retained.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: The raised wood floor in the console room has been removed. The original light fixtures have been removed. One wood and glass partition has been removed. Sheetrock® walls, carpeting, wainscot, and linoleum have been added to the control room.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original workmanship at the northeast elevation, and at the entrances at the ramp is still visible. Interior renovations hide the original architectural craftsmanship.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1175 continues to function as a launch control facility for the High Speed Test Track.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

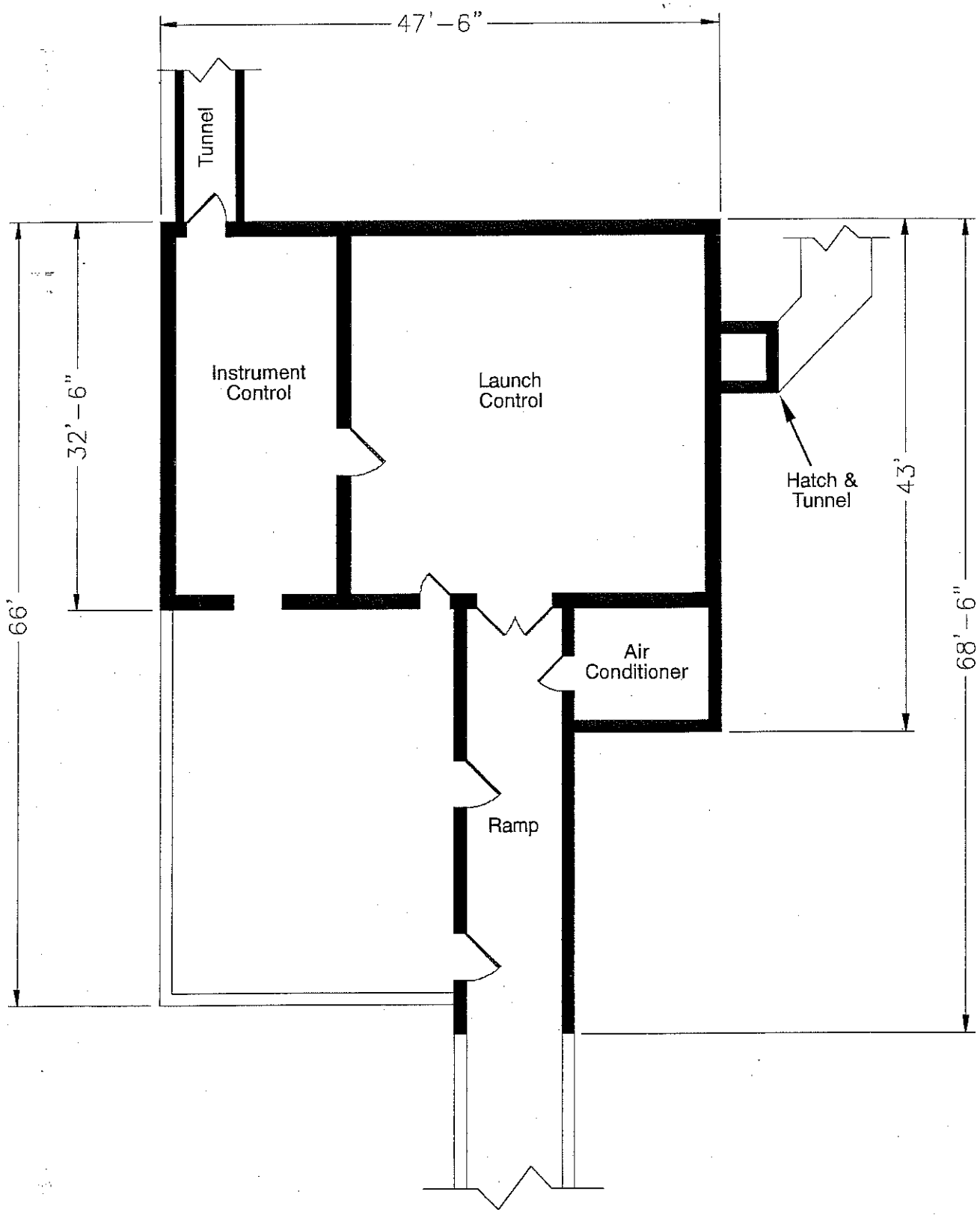
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #35**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1175 (c1980)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1175** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1176

This building was constructed in 1959 and contains 3850 SF.
The building is located at the Test Track and is known as the Sled Launch Shop.
Facilities include:

- Toilet
- Lavatory
- Shower

In Attachments 45-48 a plumbing plan, new drain pit, utility plan, sewer clean out, utilities contour plan and septic tank details can be found for Bldg 1176.

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 12: Picture of Bldg 1176

REMOVED SEPTIC SYSTEMS

BUILDING 1173

This building was constructed in 1957 and contains 17,428 SF.
The building is the main office building at the Test Track.
It contains the following facilities:

- Toilets-8
- Urinals-4
- Lavatories-9
- Janitorial Sinks-2

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 13: Picture of Bldg 1173

REMOVED SEPTIC SYSTEMS

BUILDING 1265

This building was constructed in 1957 and covers 43,388 SF.
This is the Inertial Guidance Facility, previously known as the Guided Weapons Lab.
The building contains the following facilities:

- Toilets-12
- Urinals-6
- Lavatories-12
- Janitorial Sinks-5

This building has been attached to the sewer system at Holloman AFB since before 1984.

In Attachments 49-53 a Water Piping Diagram, Partial Plumbing Plan, Floor Plan, Building, Pavement and Utilities Layout, Sewer Clean Out, and Enlarged Plan can be found for Bldg 1265.

North Wind

Letter No. NW-2008-155

Mr. Dave Griffin
Project Manager
49 CES/CEV
550 Tabosa Ave.
Holloman AFB, NM 88330-8458

11 March 2008

SUBJECT: Technical Memorandum summarizing the decommissioning of inactive septic tanks at HAFB in January of 2008

Dear Mr. Griffin:

Reference Contract Number: W9128F-04-D-0017 DO-0017

Attached please find a copy of the above referenced Technical Memorandum and attached State of New Mexico On-Site Liquid Waste System Abandonment forms. Also attached are copies of the daily reports for the field work.

Please contact me (phone 785-838-3141 or email at tmatzen@northwind-inc.com) or the Program Manager, Rusty Gilbert (phone 210-722-4074 or email at rgilbert@northwind-inc.com) if you have any questions.

Sincerely,

Thomas A. Matzen, P.G.
Project Manager
North Wind, Inc.

Attachments: Technical Memorandum summarizing decommissioning work conducted on inactive septic tanks at HAFB

cc: R. Gilbert (North Wind)
Mr. Tom Zink (USACE Omaha District)
Letter File

North Wind

Technical Memorandum

11 March 2008

To: Mr. David Griffin, Holloman AFB
CC: Mr. Tom Zink, USACE Omaha

From: Tom Matzen, North Wind, Inc

SUBJECT: Decommissioning of Abandoned Septic Tanks Conducted 8 - 24 January 2008 at Holloman AFB

Purpose

This memorandum summarizes the septic tank decommissioning activities conducted on abandoned STLFs from 8 through 24 January 2008 at Holloman AFB.

Description of Work

North Wind, Inc. (NWI) contracted a local septic system installer (Jontel Septic) to decommission 21 abandoned Septic Tanks at Holloman AFB. During the course of the decommission work NWI was requested also to abandon a septic tank at Building 1284 for a total of 22 tanks. North Wind provided a field supervisor to obtain excavation permits, coordinate field activities, and to ensure that quality and safety requirements were met.

Base dig permits were obtained for each of the systems prior to conducting any excavation work necessary to locate the systems. After dig permits were obtained, each system was excavated (if required) to the extent necessary to remove the top of each tank, crush or otherwise perforate the bottom of each tank such that water will not pool in the abandoned tank, and backfill each tank with clean fill per State of New Mexico requirements. Each system was pumped out (if it contained any liquid or sludge), and visually inspected prior to decommissioning.

The required system abandonment forms for each septic tank with accompanying photographs are in Attachment 1. Attachment 2 contains the Daily Progress Report/Quality Control Report Forms. Please note that these forms start at number 29. Forms 1 through 28 were used for daily reporting on the Septic Tank and Leach Field Inspection work.

Interpretation of Findings:

Several tanks were still active and so were not decommissioned. These include the tanks at Buildings 308 (actually an oil/water separator), 1097, 1219, 1226, 1235, and 1239. No septic tanks could be located at Buildings 1200, 1201, and 1269 though we did backfill an earthen pit at Building 1200 and an abandoned sewage treatment plant at Building 1201. Mr. Shawn Quarles, the Base safety person, marked Building 1190 off of the 332 form. Mr. Quarles stated that Building 1190 had been demolished and that there was nothing left at that location. The location of the septic tank at Building 1284 was such that it could not be accessed for demolition. The septic tank at Building 1091 was not abandoned at this time as NWI was unable to obtain a security escort. The tank at Building 1091 will be abandoned while NWI is working on the active septic tank upgrades.

As the abandonment forms indicate, the majority of the septic systems on the original list provided by HAFB were decommissioned per state requirements.

Table 1 summarizes the decommissioning activities and status of the listed septic systems.

Summary of Results

Table 1. Summary of septic system decommissioning activities for abandoned STLFs at HAFB.

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
1	308	01/24/08	Found an oil/water separator still in use.	Notified Base POC that this is an oil/water separator.
2	920	01/16/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
3	921	01/16/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
4	922	01/17/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
5	924	01/17/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
6	1091	01/24/08	Building is in security area. Could not obtain escort.	No action taken at this time. Will decommission tank when we are in the area doing tank replacement work.
7	1097	01/23/08	Found that the septic tank for this building is also hooked into Bldg 1099 and is still in use. Inspected system. This septic tank has no manholes, bottom is damaged and is leaking, no baffle present, leach field is dry and full of dirt.	Turned system back over to active list and inspected system. Inspection form is attached.
8	1190	01/14/08	During the course of obtaining a dig permit for this Bldg the safety person, Mr. Shawn Quarles, marked this one off of the 332 form. Mr. Quarles stated that this Bldg had been demolished and that nothing was left at that location.	Notified Base POC of situation regarding Bldg 1190

North Wind

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
9	1194	01/09/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
10	1196	01/08/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
11	1199	01/09/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
12	1200	01/11/08	No septic tank located. Did locate abandoned earthen pit with a concrete cover. Notified Base POC of situation and received instructions to backfill and abandon.	Removed concrete cover over pit and backfilled pit with clean fill.
13	1201	01/11/08	No septic tank located. Did locate an old abandoned treatment plant. Notified Base POC of situation and received instructions to decommission and backfill the old treatment plant.	Demolished old treatment plant by crushing bottom and caving in sides, then backfilled with clean soil.
14	1219	01/18/08	Septic tank still in use	Notified Base POC that system is still in use
15	1221	01/18/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
16	1226	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.
17	1235	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.
18	1239	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.

North Wind

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
19	1250	01/23/08	Located abandoned septic tank. Also found an old diesel tank still containing fuel.	Opened septic tank, pumped out, crushed bottom, and backfilled tank. Notified Mr. Gomolak at CE Environmental regarding diesel UST.
20	1251	01/23/08	Located abandoned septic tank	Opened tank, pumped out, crushed bottom, and backfilled tank.
21	1269	01/16/08	Could not locate any septic tank. Mr. Vernon (a 30+ year employee) stated that the building had been on the base sewer system for the last 30 years and that the septic tank may have been removed when the moat around the building was removed.	Notified Base POC that there does not seem to be a septic tank at this building.
22	1284 (not on original list, added at request of HAFB POC)	01/16/08	Septic tank hangs over back side of area and is not accessible for removal. This tank is a holding tank with a manual valve that drains to a ditch below. There is no water in the associated Bldg.	Notified Base POC. No action taken.

Future Work

As discussed above in Table 1 the septic tank at building 1091 still must be decommissioned. There are septic systems in that area that require repair and 1091 will be decommissioned when the other septic tanks are being repaired.

North Wind

Attachment 1
Septic Tank Abandonment Forms

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
ON-SITE LIQUID WASTE SYSTEM ABANDONMENT

NMED Permit No.: N/A

System Owner's Name: USACE

Address: HAFB BUILDING 920

BUILDING SEWER:

_____ Connected to Sewer Lines or Plugged/Capped based on UPC Requirements

ON-SITE LIQUID WASTE SYSTEM TYPE:

- [ ] Septic Tank
- [x] Seepage Pit
- [ ] Sec./Tert. Treatment Unit
- [ ] Other:
- [ ] Holding Tank
- [ ] Cesspool

ABANDONMENT PROCEDURE:

- [x] System Pumped
- [x] Bottom of System Opened or Ruptured or Unit Collapsed
- [x] System filled with Earth, Sand, Gravel, Concrete, or Other Approved Material
- [x] Top Cover Removed or Collapsed
- [x] System Filled to the Top of Sidewalls or above the Level of any Outlet Pipe
- [x] System Filled Level with Top of Ground Surface

COMMENTS/VIOLATIONS:

Elevation 4396 GPS: N3284013
W106.12699

ABANDONMENT PERFORMED BY:

Company Name: Portal Septic Co

Address: PO Box 927 Carlsbad NM 88537

NMED ACTION TAKEN:

- [ ] **Abandonment Approved**
- [ ] **Abandonment Approved w/conditions** (See Comments/Violations)
- [ ] **Abandonment Not Approved** (See Comments/Violations)

FINAL APPROVAL:

- [ ] Granted
- [ ] Not Granted

_____
NMED Inspector Date

OK - If Abandoned and meets Requirements	N/C - Not Compliant
N/I - Not Inspected	N/V - Not Verified
N/A - Not Applicable	

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
ON-SITE LIQUID WASTE SYSTEM ABANDONMENT

NMED Permit No.: _____

System Owner's Name: US ARMY CORP of ENGINEERS

Address: HAFB – Building #921

BUILDING SEWER:

_____ Connected to Sewer Lines or Plugged/Capped based on UPC Requirements

ON-SITE LIQUID WASTE SYSTEM TYPE:

- [X] Septic Tank
- [ ] Seepage Pit
- [ ] Sec./Tert. Treatment Unit
- [ ] Other:
- [ ] Holding Tank
- [ ] Cesspool

ABANDONMENT PROCEDURE:

- [✓] System Pumped
- [✓] Bottom of System Opened or Ruptured or Unit Collapsed
- [✓] System filled with Earth, Sand, Gravel, Concrete, or Other Approved Material
- [✓] Top Cover Removed or Collapsed
- [✓] System Filled to the Top of Sidewalls or above the Level of any Outlet Pipe
- [✓] System Filled Level with Top of Ground Surface

COMMENTS/VIOLATIONS:

Elevation 4113 GPS N-32.83064
W-106126666

ABANDONMENT PERFORMED BY:

Company Name: Foutel Septic Co

Address: P.O. Box 957 Zuzu NM 88337

NMED ACTION TAKEN:

- [ ] Abandonment Approved
- [ ] Abandonment Approved w/conditions (See Comments/Violations)
- [ ] Abandonment Not Approved (See Comments/Violations)

FINAL APPROVAL:

- [ ] Granted
- [ ] Not Granted

_____
NMED Inspector Date

OK - If Abandoned and meets Requirements
NI - Not Inspected
N/A - Not Applicable
N/C - Not Compliant
N/V - Not Verified

Bulsans 931

Buckley
921

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
ON-SITE LIQUID WASTE SYSTEM ABANDONMENT

NMED Permit No.: N/A

System Owner's Name: US Army Corp of Engineers

Address: HAFB Building # 922

BUILDING SEWER:

_____ Connected to Sewer Lines or Plugged/Capped based on UPC Requirements

ON-SITE LIQUID WASTE SYSTEM TYPE:

- [V] Septic Tank
- [ ] Seepage Pit
- [ ] Sec./Tert. Treatment Unit
- [ ] Other:
- [ ] Holding Tank
- [ ] Cesspool

ABANDONMENT PROCEDURE:

- [V] System Pumped
- [V] Bottom of System Opened or Ruptured or Unit Collapsed
- [V] System filled with Earth, Sand, Gravel, Concrete, or Other Approved Material
- [V] Top Cover Removed or Collapsed
- [V] System Filled to the Top of Sidewalls or above the Level of any Outlet Pipe
- [V] System Filled Level with Top of Ground Surface

COMMENTS/VIOLATIONS:

Elevation 4027 GPS N32.83736
W. 106.12595

ABANDONMENT PERFORMED BY:

Company Name: JONTEL Septic Co.

Address: PO Box 927 LA Luz, NM 88337

NMED ACTION TAKEN:

- [ ] Abandonment Approved
- [ ] Abandonment Approved w/conditions (See Comments/Violations)
- [ ] Abandonment Not Approved (See Comments/Violations)

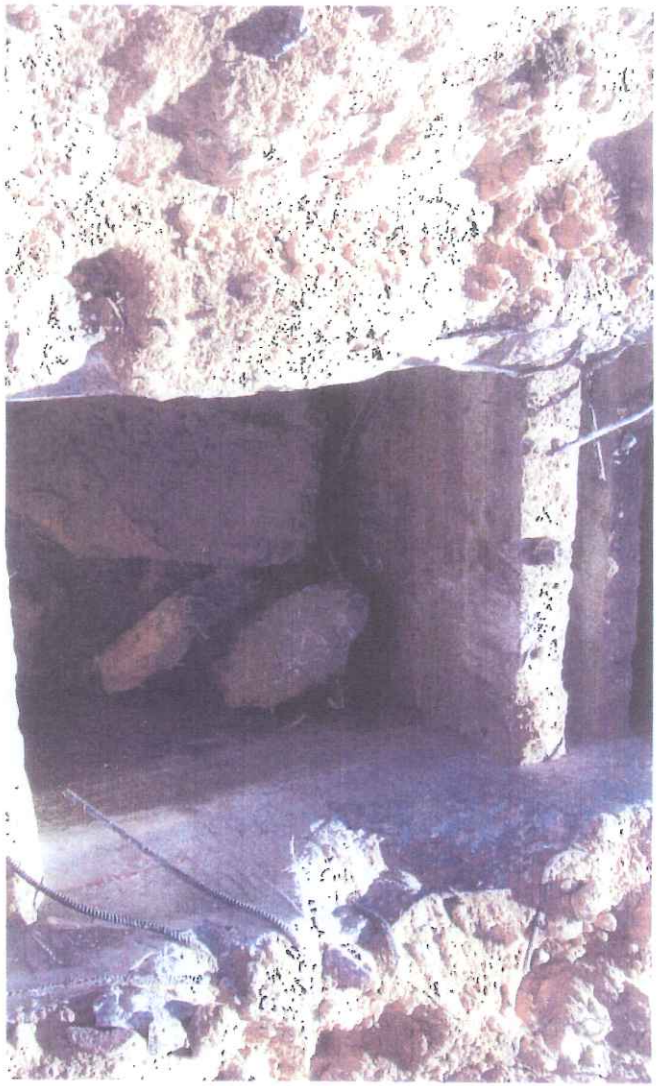
FINAL APPROVAL:

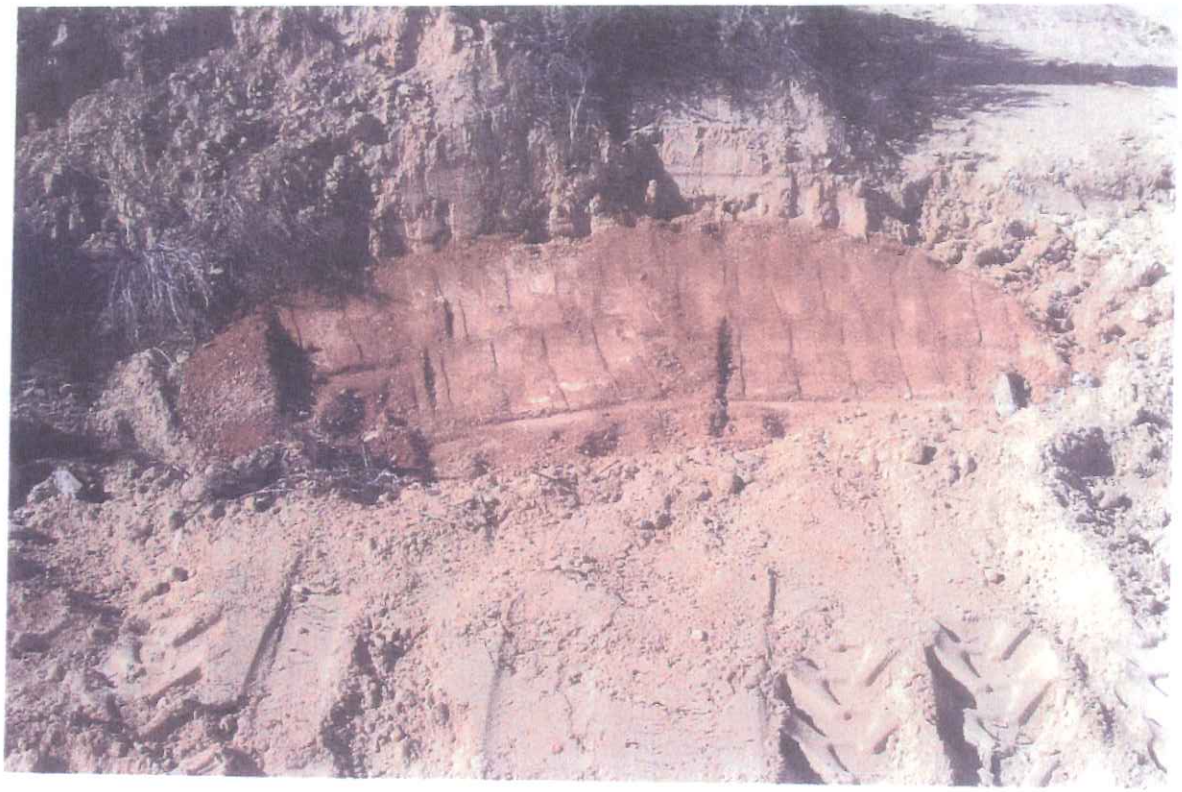
- [ ] Granted
- [ ] Not Granted

NMED Inspector Date

OK - If Abandoned and meets Requirements	N/C - Not Compliant
N/I - Not Inspected	N/V - Not Verified
N/A - Not Applicable	

#927





BLDG 922

Appendix B
Photographic Log

Appendix B
Photographic Log
Building 920 (OT-C531)

Photo No.	Task and Description
1	Septic Tank Location at Building 920
2	Septic Field Layout at Building 920
3	Markings at Septic Tank, Building 920
4	Leach Field at Building 920
5	Influent Line from Building 920 to Septic Tank
6	Monitoring Well OTC531A-MW01 at Building 920 Leach Field

PHOTO 1: Septic Tank Location at Building 920

PHOTO 2: Septic Field Layout at Building 920

PHOTO 3: Markings at Septic Tank, Building 920

PHOTO 4: Leach Field at Building 920

PHOTO 5: Influent Line from Building 920 to Septic Tank

PHOTO 6: Monitoring Well OTC531A-MW01 at Building 920 Leach Field

Appendix B

Photographic Log

Building 921 (OT-C531B)

Photo No.	Task and Description
1	Building 921 Location
2	Leach Field Building 921
3	Septic Location Building 921
4	Boring Locations Building 921
5	Hand Augering Building 921
6	Geoprobe® Sampling Building 921
7	Utilities Going In Building 921

PHOTO 1: Building 921 Location

PHOTO 2: Leach Field Building 921

PHOTO 3: Septic Location Building 921

PHOTO 4: Boring Locations Building 921

PHOTO 5: Hand Augering Building 921

PHOTO 6: Geoprobe® Sampling Building 921

PHOTO 7: Utilities Going In Building 921

Appendix B
Photographic Log
Building 922 (OT-C531C)

Photo No.	Task and Description
1	Building 922 Location
2	Leach Field Location Building 922
3	Leach Field Building 922
4	Pin Flagged Leach Field Building 922
5	Septic Location Building 922
6	Suspect Line to Septic Building 922

PHOTO 1: Building 922 Location

PHOTO 2: Leach Field Location Building 922

PHOTO 3: Leach Field Building 922

PHOTO 4: Pin Flagged Leach Field Building 922

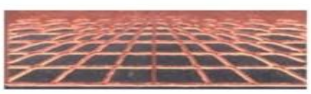
PHOTO 5: Septic Location Building 922

PHOTO 6: Suspect Line to Septic Building 922

Appendix C
Geophysical Report

ULS SERVICES CORPORATION

GEOMARKOUT LOCATING Co a tradename



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5 July 2012

Christopher Long, P.G.
Scientist
Federal Services
Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, TX 77077

Subject: Field Documentation Report for Geophysical Services -
Location of Utilities and Underground Features Associated
With Former UST and Septic System Sites,
Holloman AFB, NEW MEXICO (SHAW PO 783916-000 OP)

Gentlemen:

This report documents the recent Geophysical Survey field work ULS Services Corp completed at the subject site On and between the dates of 11 June 2012 thru 23 June 2012.

SHAW / ULS SERVICES CORP
GEOPHYSCIAL SERVICES
FORMER UST AND SEPTIC SYSTEM SITES
5 JULY 2012

SCOPE OF WORK

Scope of this work is includes geophysical services at approximately 29 Former UST or Septic Systems sites located across Holloman AFB that have reportedly undergone past abandonment in place or excavation activities. Geophysical services are employed in an attempt to locate potential USTs, former UST excavation areas, abandoned septic tanks or excavations and associated leach field areas. Location of underground utilities near these observed features is included. Observations are marked out in field and electronically mapped with GPS data collection and GIS presentation. Survey of each site is approximately 25 by 25 to 100 by 100 feet in size.

METHODS

Methods utilized in performance of this work include: Visual Inspection, Analog Real - Time Electromagnetic Induction Conductivity Detection (EMICD), Magnetic Locating (MGL), Ground Penetrating Radar (GPR), and EM Pipe and Cable Location (EMPCL). A sub-meter WAAS GPS receiver with automatic real -time differential correction and ESRI Arcpad software is utilized to collect observation data. ESRI Arc View 10 GIS software is utilized for mapping presentation.

EMIMD ground induction methods are employed to detect both 1) broad metal mass anomalies (Rectangular Surface Projections) or conductive zones that may be indicative of potential USTs – Septic tanks, conductive metal debris, steel reinforced concrete, UST's, building hosts, piping, building demo materials, drums, sumps or other unknown burial materials; and 2) to detect relative lateral changes in conductive zones of soil or backfill materials relative to native soils. Former UST excavations and septic -leachate material may potentially have a higher conductive response or well drained leachate fill materials associated with septic systems may in some cases exhibit a relatively lower or quiet conductive response relative to surrounding higher conductive soil response. A two-way Cartesian grid pattern of five by five feet is walked within the search area (site). Observations are real time and marked on ground surface with paint and pin flagging. Observations are collected with a sub- meter GPS with automatic differential correction and plotted approximately onto web based imagery.

GPR is utilized to detect and potentially observe former UST excavation sidewalls as well as septic – leach field pit sidewall and fill areas. GPR is also utilized to compliment the EM Pipe and Cable utility survey work by potentially locating conductive as well as non-conductive utilities.

A EM Pipe and Cable Survey is conducted at each site by performing ambient passive live power and communication line sweeps, active ground induction sweeps, and active direct- connect or induction- clamp sweeps using existing conducts or pipes visibly nearby. Multiple active frequencies are utilized for best Detection. Utilities are identified where possible and marked unknown if not identified.

All observations are marked with hi-visibility orange-red marking paint. Some Ares are hi-lighted with black paint due to light soil conditions. GPR boundaries indicating potential septic tank and leach field areas are outlined with black paint. Pin flags are also utilized to mark these boundaries in soft soil and weed areas.

OBSERVATIONS

Site Description

The Project Site (Holloman AFB - Former UST and Septic Systems) is comprised of approximately 29 different environmental site locations (heir in referred to as Sites) . Each sites includes and varies in description from existing active building locations to in-active remote abandoned to former building areas where USTs or Septic systems were utilized in the past. Each Site is fairly flat with sandy to gravelly surface conditions. Some sites include native brush and weeds. Sites near active building areas include asphalt or concrete surfaces, sidewalks and planter areas. ULS field staff helped review historical documentation available of each site in the field. Where available, drawings and photographs were reviewed. When available, reported GPS coordinates from reports, of septic tank locations, were utilized by SHAW field staff to navigate to septic tank location to aid focus search area.

Generally there are no surface indications of USTS or Septic tanks, however some limited features exist at some sites and include potential vent riser pipes and asphalt patching, settling areas, and conidial – rectangular cracks in concrete. Surface indications of septic systems at some sites include potential inactive clean- outs pipes near building and nearby existing upgraded sewer man-hole systems that have been connected to the existing Base sewer collection system. Some septic system sites have open holes , surface erosion, and associated potential underground voids observed near the inactive cleanouts and suspected septic search area.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

General ambient or background EM conditions at this site are categorized as being high or noisy most likely resulting from caliche or saline soil conditions throughout the area. These conditions all result in a high ambient background EMICD response that are difficult to filter out, however, subtle to distinct lateral changes are observed potentially marking position of former UST excavations. Magnetic locator is not affected by saline conditions. GPR response in these conditions is poor to somewhat fair, however, subtle, trends in GPR observations exhibit dipping or high angle (from horizontal) refraction bands indicating potential soil side-wall trends allowing for location of approximate former excavations. The use of EMICD and GPR data in conjunction with historical information and physical observations are all utilized to mark the approximate location of potential former USTs in the field as shown on the GIS imagery maps.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

Similar response is observed near former septic systems. Most all septic tanks are reported to have been abandoned in place or partly crushed in place. Magnetic locator surveys revealed concentrated areas of metal response (metal anomalies) likely from metal plates and rebar in septic tanks in areas near former sewer clean-outs and next to reported septic tank locations where latitude and longitude data is available. EM Induction and GPR transects over these metal anomalies further corroborated these findings. EM Induction survey results near the effluent (down gradient) side of metal anomalies (potential septic tanks) resulted in observation of relatively moderately higher lateral response to zones of low to quiet lateral response zones near the septic tanks relative to the ambient response in surrounding area. GPR data across these zones exhibited very subtle side-wall trends that appear to corroborate with EMICD findings. The use of EMICD and GPR data in conjunction with historical information and physical observations of cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs in the field and as shown on the GIS imagery maps.

CONCLUSIONS and LIMITATIONS

The use of EMICD and GPR data in conjunction with historical information and physical observations of reported building location, vent riser location, boiler room location, existing and abandoned sewer cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs , Septic tanks and leach fields. Ambient soil conductivity at this site is very high and EM and GPR data observed is very subtle. Field trends are used to mark the approximate location of potential targets.

As in any type of survey or investigation to determine characteristics below grade, careful exploratory excavation or drilling may be needed to further help determine a more accurate determination of the subsurface. Use of hand tools and air knifing is also useful to help as a safety measure. Base one- call utilities, as well as, private 811 one –call should be consulted and recalled as necessary.

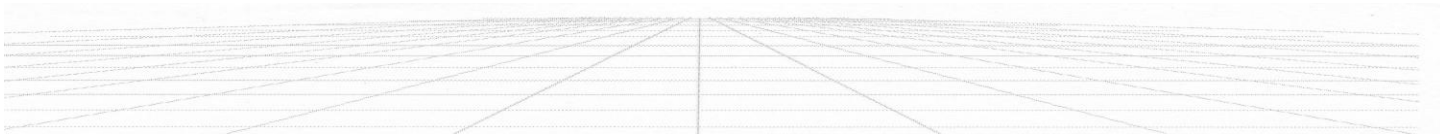
If you have any questions regarding this report please contact me at (206) 384- 2857.

Sincerely,

ULS SERVICES CORPORATION
Geomarkout tradename

Michael W. Benedict
Site Representative

Admin Office/Billing: PO Box 724 Pocatello, Idaho 83204
(208) 234-1441 Fax (208) 234-1507 1 800 301-4420
Seattle / Portland / SAC / Alaska / HWI – AS - GUAM Operations
1 - (866) 804- 5734 / San Diego – LA / Operations 1 - (800) 528-8206



BLDG 920 SEPTIC SYSTEM
HOLLOMAN AFB

WGS_1984_UTM_Zone_13N
ULS SERVICES CORP
mwb 16 June 2012

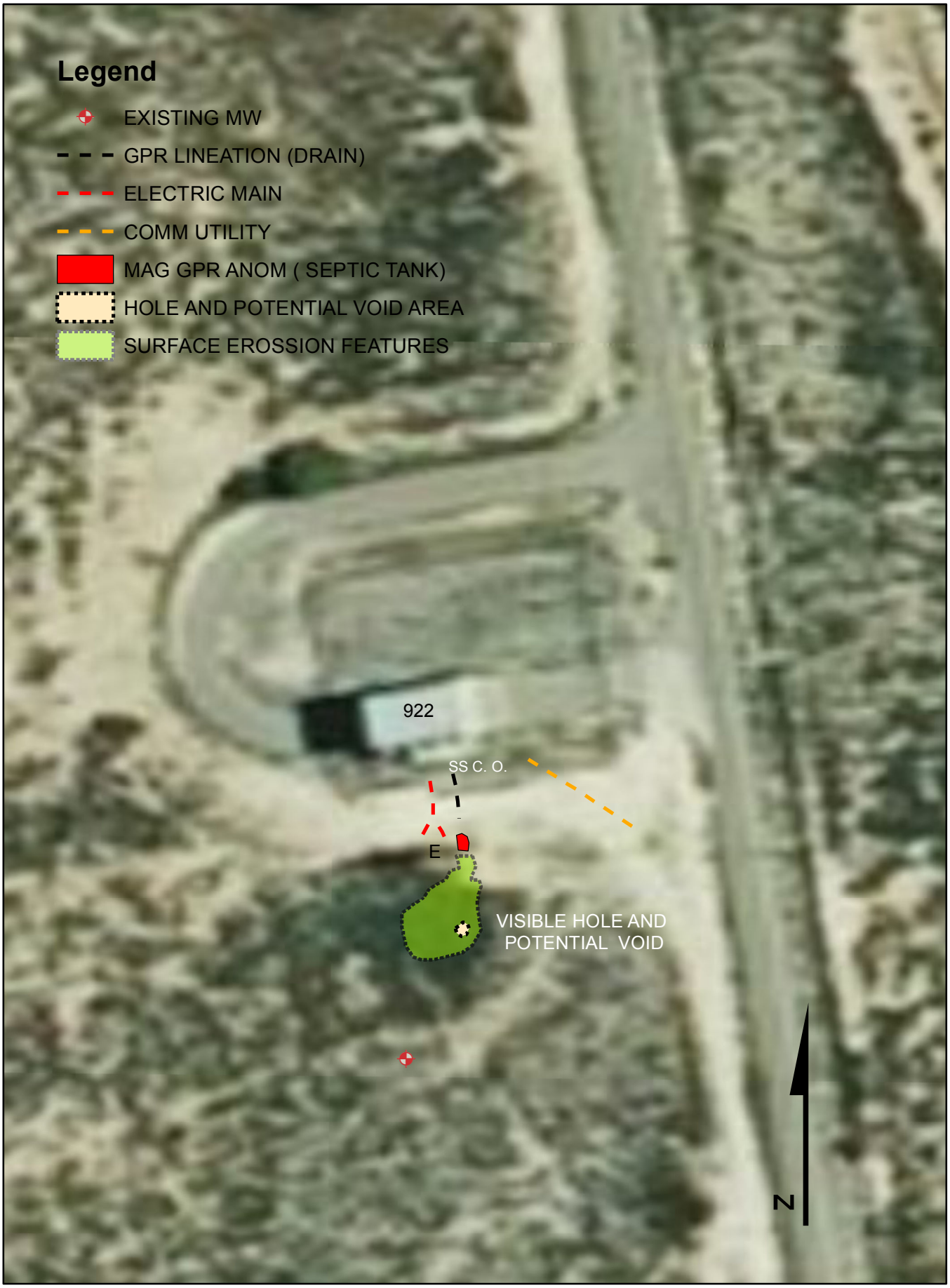
0 10 20 40 60 80
Feet

BLDG 921 SEPTIC SYSTEM
HOLLOMAN AFB

WGS_1984_UTM_Zone_13N
ULS SERVICES CORP
mwb 18 June 2012

0 10 20 40 60 80
Feet

BLDG 922 SEPTIC SYSTEM
HOLLOMAN AFB



WGS_1984_UTM_Zone_13N
ULS SERVICES CORP
mwb 18 June 2012

0 15 30 60 90 120
Feet

Appendix D
Sample Collection Logs

Sample Collection Log

Shaw a CB&I company Solutions

- Holloman AFB

Manager Christopher Long

*STATION 1

Location Code OTC531A (Bldg 920) 0001

RFA / COC Number 144106 - H012

Sample Number ~~OTC531-IS-0011-MMDDYY~~ OTC531A 071012 0001

Task

Sample Name OTC531-z-OTC531-IS-~~0011~~-MMDDYY-z

Collection Date 071012

DPT Hand Auger Grab

Sampling ~~Unknown~~ Sample Type ~~Unknown~~

Collection Time 0855

Method

Sample Purpose ~~Unknown~~ Invest.

Start Depth 3'

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip ~~Geoprobe~~ Hand Auger

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

Sample Team CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Logged By / Dat Chris Hill 7/10/12 Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw Environmental Solutions

Manager Christopher Long

* STATION 1

Location Code OTC531A (Bldg 920)

RFA / COC Number 144106 - H012

Sample Number ~~OTC531~~-IS-0002-~~MMDDYY~~
OTC53A 071012

Task

Sample Name OTC531-z-OTC531-IS-0002-MMDDYY-z

Collection Date 071012

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0905

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10'

End Depth 12'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

Sample Team CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chad Hill 7/10/12 Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw Environmental Solutions

Manager Christopher Long

* STATION 2

Location Code FIELDQC

RFA / COC Number 144106 - H012

Sample Number ~~OTC531~~-IS-0004-~~MMDDYY~~-FD
OTC531A 071012

Task

Sample Name FIELDQC-z-OTC531-IS-0004-MMDDYY-FD-z

Collection Date 071012

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0923

Sample Purpose ~~Unknown~~ Field QC

Start Depth 7'

End Depth 9'

QC Code FIELD DUPLICATE

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Logged By / Dat Claire Zinn 7/10/12

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw Environmental Solutions

Manager Christopher Long

* STATION 2

Location Code OTC531A (Bldg 920)

RFA / COC Number 144106 - H012

Sample Number ~~OTC531~~-IS-0003-~~MMDDYY~~
OTC531A 071012

Task

Sample Name OTC531-z-OTC531-IS-0003-MMDDYY-z

Collection Date 071012

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0923

Sample Purpose ~~Unknown~~ Invest.

Start Depth 7'

End Depth 9'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Logged By / Dat Chase Finn 7/10/12

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw Solutions

*STATION 2

Manager Christopher Long

Location Code OTC531A (Bldg 920)

RFA / COC Number 144106 - H012

Sample Number ~~OTC531~~-IS-0005-~~MMDDYY~~ OTC531A 071012

Task

Sample Name OTC531-z-OTC531-IS-0005-MMDDYY-z

Collection Date 071012

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0935

Sample Purpose ~~Unknown~~ Invest.

Start Depth 14'

End Depth 16'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

EMS Shaw

Logged By / Dat Chase Hill 7/10/12

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw a CB&I Solutions

Manager Christopher Long

* STATION 3

Location Code OTC531A (Bldg 920)

RFA / COC Number 144106 - H012

Task

Sample Number ~~OTC531~~-IS-0006-~~MMDDYY~~
OTC531A 071012

Sample Name OTC531-z-OTC531-IS-0006-MMDDYY-z

Collection Date 071012

DPT Hand Auger

Sampling Method Unknown

Sample Type ~~Unknown~~ Grab

Collection Time 0950

Sample Purpose ~~Unknown~~ Invest.

Start Depth 3'

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip ~~Geoprobe~~ Hand Auger

Sample Matrix SOIL

QC Partners:
(TB) (EB) (FB)

SampleTeam CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Logged By / Dat Chase Hill 7/10/12 Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

* STATION 3

Location Code OTC531A (Bldg 920)

RFA / COC Number 144106 - H012

Task

Sample Number ~~OTC531~~-IS-0007-~~MMDDYY~~ OTC531A 071012

Sample Name OTC531-z-OTC531-IS-0007-MMDDYY-z

Collection Date 071012

Sampling ~~Unknown~~ DPT

Method Invest.

Sample Type ~~Unknown~~ Grab

Collection Time 1005

Start Depth 10'

Sample Purpose ~~Unknown~~

End Depth 12'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sample Matrix SOIL

Sampling Equip Geoprobe

QC Partners:

(TB) (EB) (FB)

SampleTeam CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Logged By / Dat Chris Hill 7/10/12

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw A CB&I Company Solutions

Manager Christopher Long

* STATION 4

Location Code OTC531A (Bldg 920)

RFA / COC Number 144106-H012

Sample Number ~~OTC531~~-IS-0008-~~MMDDYY~~ OTC531A 071012

Task

Sample Name OTC531-z-OTC531-IS-0008-MMDDYY-z

Collection Date 071012

Sampling Method ~~DPT~~ Hand Auger

Sample Type ~~Unknown~~ Grab

Collection Time 1020

Sample Purpose ~~Unknown~~ Invest.

Start Depth 3'

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip ~~Geoprobe~~ Hand Auger

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Logged By / Dat Chris Hill 7/10/12

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw A Solutions

Manager Christopher Long

* STATION 4

Location Code FIELDQC

RFA / COC Number 144100 - H012

Sample Number ~~QTC531~~-IS-0008-~~MMDD~~YY-MS

Task

Sample Name FIELDQC-z-OTC531-IS-0008-MMDDYY-MS-z
OTC531A 071012

Collection Date 071012

Sampling Method ~~Unknown~~ Hand Auger

Sample Type ~~Unknown~~ Grab

Collection Time 1020

Sample Purpose ~~Unknown~~ Field QC

Start Depth 3'

End Depth 5'

QC Code LAB MATRIX SPIKE

Sampling Equip B Hand Auger

Sample Matrix SOIL

QC Partners:
(TB) (EB) (FB)

SampleTeam

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chase Hill 7/10/12 Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw Engineering Solutions

Manager Christopher Long

* STATION 4

Location Code FIELDQC

RFA / COC Number 144106 - H012

Sample Number ~~OTC531~~-IS-0008-~~MMDDYY~~-~~MSM~~ OTC531A 071012 - MSD

Task

Sample Name FIELDQC-z-OTC531-IS-0008-MMDDYY-MSM-z

Collection Date 071012

Hand Auger ~~DP~~

Sampling ~~Unknown~~

Method Field QC

Sample Type ~~Unknown~~ Grab

Collection Time 1020

Start Depth 3'

Sample Purpose ~~Unknown~~

End Depth 5'

QC Code LAB MATRIX SPIKE DUPLICATE

Sampling Equip ~~Geoprobe~~ Hand Auger

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chad Wis 7/10/12 Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

+ STATION 4

Location Code OTC531A (Bldg 920)

RFA / COC Number 144106 - H012

Task

Sample Number ~~OTC531-IS-0009-MMDDYY~~ OTC531A 071012

Sample Name OTC531-z-OTC531-IS-0009-MMDDYY-z

Collection Date 071012

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1045

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10'

End Depth 12'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chase HM 7/10/12 Reviewed By / Dat

Sample Collection Log

Shaw A CB&I Solutions

- Holloman AFB

Manager Christopher Long

* STATION 4

Location Code OTC531 A (Bldg 920)

RFA / COC Number 144106 - H012

Sample Number ~~OTC531~~-IS-0010-~~MMDDYY~~
OTC531A 071012

Task

Sample Name OTC531-z-OTC531-IS-0010-MMDDYY-z

Collection Date 071012

Sampling Method ~~Unknown~~ DPT Hand Auger

Sample Type ~~Unknown~~ Grab

Collection Time 1050

Sample Purpose ~~Unknown~~ Invest.

Start Depth 0'

End Depth 2'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip ~~Geoprobe~~ Hand Auger

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Logged By / Dat Chan HW 7/10/12

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw Environmental & Infrastructure Solutions

Manager Christopher Long

* STATION 4

Location Code OTC531 A (Bldg 920) 0011

RFA / COC Number 144106 - H012

Sample Number ~~OTC531-IS-0001-MMDDYY~~ 071012 OTC531A 0011

Task

Sample Name OTC531-z-OTC531-IS-~~0001~~-MMDDYY-z

Collection Date 071012

Sampling ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1055

Method Invest.

Start Depth 11.5'

Sample Purpose ~~Unknown~~

End Depth 13.5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Logged By / Dat Chris Hill 7/10/12 Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager **Christopher Long**

Location Code **OTC531A** (Bldg 920) *RFA / COC Number* 144106-H017

Sample Number ~~**OTC531-GW-5311-MMDDYY**~~ OTC531A 531A1 071712

Task

Sample Name **OTC531-z-OTC531-GW-5311-MMDDYY-z**

Collection Date 071712

Sampling Method ~~**Unknown**~~ micropurge

Sample Type ~~**Unknown**~~ Grab

Collection Time 1425

Sample Purpose ~~**Unknown**~~ invest.

Start Depth

End Depth

QC Code **NORMAL ENVIRONMENTAL SAMPLE**

Sampling Equip QED Bladder Pump

Sample Matrix **GROUND WATER**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SW8015B : GRO	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	C	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
SW8015B : ORO	D	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015B : DRO	D	Unknown	2	1	L	1 Liter Amber Glass	H2SO4
PCBs by SW8082A	E	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Explosives by SW8330A	F	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Tritium by 906.0 Mod	G	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Mercury by SW7470A	H	Unknown	0	500	ML	500 ml Poly Container	HNO3
Metals by SW6020A	H	Unknown	0	500	ML	500 ml Poly Container	HNO3
Metals by SW6010C	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
Total CN water by 335.4	I	Unknown	1	500	ML	500 ml Poly Container	NaOH
TDS by 160.1	J	Unknown	1	500	ML	500 ml Poly Container	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Hill 07/17/12 *Reviewed By / Dat* _____

Sample Collection Log

Page: ~~19 of 49~~ 1/1

Shaw Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code ~~FIELDQC~~ IDW

RFA / COC Number HO 38

Sample Number ~~OTC644-GW-0441-MMDDYY-FD~~ LDY-IDWD1-090412

Sample Name ~~FIELDQC-2-OTC644-GW-0441-MMDDYY-FD-z~~

Task

Collection Date 09/04/2012

Sampling Method ~~Unknown~~ Composite

Sample Type ~~Unknown~~ Soil

Collection Time 1330

Sample Purpose ~~Unknown~~ IDW characterization

Start Depth NA

QC Code ~~FIELD DUPLICATE~~ NA

End Depth NA

Sampling Equip Stainless steel Trowel/Bowl/Aluminum

Sample Matrix ~~GROUND WATER~~ IDW Soil

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam LaThom, Hodu

Containers:

	Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
1)	VOCs by SW8260C TCLP VOCs	A	Unknown	~~3~~ 1	~~40~~ 8oz	~~ML~~	~~40 ml VOA Vials~~ Glass	~~HCL~~ Cool to 4°C
	~~SW8015B : GRO~~	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
2)	SVOCs by SW8270D TCLP SVOCs / other organics	EB	Unknown	~~2~~ 1	8	x oz	~~1 Liter Amber Glass~~ Glass	Cool to 4°
	~~SW8015B : GRO~~	B	Unknown	0	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~SW8015B : DRO~~	B	Unknown	2	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~PCBs by SW8082A~~ ~~TCLP~~	E	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
	~~Explosives by SW8330A~~	F	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
3)	~~Tritium by 906.0 Mod~~ RCI	C	Unknown	~~2~~ 1	~~1~~ 8oz		~~1 Liter Amber Glass~~ Glass	~~Cool to 4°C~~ Cool to 4°C
4)	Mercury by SW7470A TCLP Mercury	~~F~~ D	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~ oz	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
5)	Metals by SW6020A TCLP Metals	~~H~~ E	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
	~~Metals by SW6010C~~	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
	~~Total CN water by 335.4~~	I	Unknown	1	500	ML	~~500 ml Poly Container~~	NaOH
	~~TDS by 160.1~~	J	Unknown	1	500	ML	500 ml Poly Container	~~Cool to 4°~~

Comments: Composite Soil sample for TCLP analyses of IDW cuttings rolloff at Lay down Yard, 09/04/12

Sketch Location: Rolloff box Composite Sample @ Lay down Yard.

Analyses: TCLP VOCs, TCLP SVOCs, TCLP metals, TCLP Mercury, RCI

LDY = Lay down Yard

~~Shaw~~ *Logged By / Dat* Mel Hall *Reviewed By / Dat* _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code BULK WATER TANK

Sample Number HAFB-IDW-BULKWATER-0001-111612

Sample Name HAFB-IDW-BULKWATER-0001-111612

RFA / COC Number 144106 H070

Task 144106 .JM20000

Collection Date 11/16/12

Sampling Method BAILER

Sample Type GRAB

Collection Time 13:00

Sample Purpose CONFIRM IDW

QC Code EQUIPMENT BLANK

Start Depth N/A

End Depth N/A

Sampling Equip DISPOSABLE BAILER

Sample Matrix **WATER**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam JH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	B	Unknown	4	8	OZ	8OZ Amber Glass	Cool to 4°
SW8015 : ORO	C	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015 : DRO	C	Unknown	1	1	L	1 Liter Amber Glass	H2SO4
Metals by SW6020A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
METALS by SW6020A	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Mercury by SW7470A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Metals by SW6010C	D	Unknown	1	500	ML	500 ml Poly Container	HNO3
	E		1	500	ML	500 ml Poly Cont	Cool to 4°
SW8015 : GRO	F	Unknown	3	40	ML	40 ml VOA Vials	HCL

Comments: Sample collected from Bulk water Storage tank after all water drums were consolidated. Sent both a preserved and unpreserved 500ml Poly for Metals. Spoke with Lab and they said to send unpreserved, but I think maybe they made a mistake.

Sketch Location:

Shaw *Logged By / Dat* _____ *Reviewed By / Dat* _____

Sample Collection Log

- HOLLOMAN AFB

Manager **CHRISTOPHER LONG**

Location Code **OTC531A** (Bldg 920)

RFA / COC Number _____

Sample Number **OTC531A-GW-531A2-MMDDYY**

Logging Co

Collection Date 5/16/13

Sampling Method Micropurge ~~UNKNOWN~~

Collection Time _____

Sample Type **GRAB**

Sample Purpose **INVESTIGATOR**

Start Depth _____

QC Code **NORMAL ENVIRONMENTAL SAMPLE**

End Depth _____

Sampling Equip _____

Sample Matrix **GROUND WATER**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam _____

Containers:

Analytical Suite	Frtn	Filtered	Qty	Container Type	Perservative	Lab
VOCS SW8260C	A	TOTAL	3	40 ML VOA VIALS	HCL	:CUTEST LABS, ORLA
SW8015B : GRO	B	TOTAL	3	40 ML VOA VIALS	HCL	:CUTEST LABS, ORLA
SVOCS SW8270D	C	TOTAL	2	1 LITER AMBER GLAS:	COOL TO 4°	:CUTEST LABS, ORLA
SW8015B : ORO	D	TOTAL	0	1 LITER AMBER GLAS:	H2SO4	:CUTEST LABS, ORLA
SW8015B : DRO	D	TOTAL	2	1 LITER AMBER GLAS:	H2SO4	:CUTEST LABS, ORLA
PCBS SW8082A	E	TOTAL	2	1 LITER AMBER GLAS:	COOL TO 4°	:CUTEST LABS, ORLA
EXPLOSIVES SW8330A	F	TOTAL	2	1 LITER AMBER GLAS:	COOL TO 4°	:CUTEST LABS, ORLA
TRITIUM 906.0 MOD	G	TOTAL	2	1 LITER AMBER GLAS:	COOL TO 4°	:CUTEST LABS, ORLA
TOTAL CN WATER 335.4	H	TOTAL	1	500 ML POLY CONTAINI	NAOH	:CUTEST LABS, ORLA
TDS 160.1	I	TOTAL	1	500 ML POLY CONTAINI	COOL TO 4°	:CUTEST LABS, ORLA
METALS SW6010C	J	TOTAL	0	500 ML POLY CONTAINI	HNO3	:CUTEST LABS, ORLA
METALS SW6020A	J	TOTAL	0	500 ML POLY CONTAINI	HNO3	:CUTEST LABS, ORLA
MERCURY SW7470A	J	TOTAL	1	500 ML POLY CONTAINI	HNO3	:CUTEST LABS, ORLA

Comments: Sample not collected. Well purged dry and did not recharge.

Sketch Location:

Logged By / Date: _____

Reviewed By / Date: _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

* STATION 1

Manager Christopher Long

Location Code OTC531B (Bldg 921)

RFA / COC Number 144106-H013

Sample Number ~~OTC531~~-IS-0001-~~MMDDYY~~ OTC531B 071112

Task

Sample Name OTC531-z-OTC531-IS-0001-MMDDYY-z

Collection Date 071112

Sampling ~~Unknown~~ Hand Auger

Sample Type ~~Unknown~~ Grab

Collection Time 0800

Method Invest.

Start Depth 3'

Sample Purpose ~~Unknown~~

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Hand Auger

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chase Hiss 07/11/12 Reviewed By / Dat

Sample Collection Log

Shaw | Solutions

- Holloman AFB

* STATION 1

Manager Christopher Long

Location Code OTC531B (Bldg 921)

RFA / COC Number 144106 - H013

Sample Number ~~OTC531~~-IS-0002-~~MMDDYY~~ OTC531B 071112

Task

Sample Name OTC531-z-OTC531-IS-0002-MMDDYY-z

Collection Date 071112

Sampling Method ~~Unknown~~ DPT Invest.

Sample Type ~~Unknown~~ Grab

Collection Time 0823

Sample Purpose ~~Unknown~~

Start Depth 10'

End Depth 12'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chase Hill 07/11/12 Reviewed By / Dat

Sample Collection Log

- Holloman AFB

* STATION 2

Shaw a division of Solutions

Manager Christopher Long

Location Code OTC531B (Bldg 921) *RFA / COC Number* 144106-H013

Sample Number ~~OTC531~~-IS-0003-~~MMDDYY~~ OTC531B 071112

Sample Name OTC531-z-OTC531-IS-0003-MMDDYY-z *Task*

Collection Date 071112

Sampling Method ~~Unknown~~ DPT Invest. *Sample Type* ~~Unknown~~ Grab *Collection Time* 0845

Sample Purpose ~~Unknown~~ *Start Depth* 7'

End Depth 9'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe *Sample Matrix* SOIL

QC Partners:

(TB) (EB) (FB) *SampleTeam* CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Hill 07/11/12 *Reviewed By / Dat*

Sample Collection Log

- Holloman AFB

* STATION 2

Shaw Environmental Solutions

Manager Christopher Long

Location Code FIELDQC

RFA / COC Number 144106 - H013

Sample Number ~~OTC531~~-IS-0004-~~MMDDYY~~-FD
OTC531B 071112

Task

Sample Name FIELDQC-z-OTC531-IS-0004-MMDDYY-FD-z

Collection Date 071112

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0845

Sample Purpose ~~Unknown~~ Field QC

Start Depth 7'

End Depth 9'

QC Code FIELD DUPLICATE

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) *(EB)* *(FB)*

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Hill 07/11/12 *Reviewed By / Dat*

Sample Collection Log

- Holloman AFB

* STATION 2

Shaw Environmental Solutions

Manager Christopher Long

Location Code OTC531B (Bldg 921)

RFA / COC Number 144106-H013

Sample Number ~~OTC531~~-IS-0005-~~MMDDYY~~ OTC531B 071112

Task

Sample Name OTC531-z-OTC531-IS-0005-MMDDYY-z

Collection Date 07 11 12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0850

Sample Purpose ~~Unknown~~ Invest.

Start Depth 14'

End Depth 16'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Sample Collection Log

- Holloman AFB

* STATION 3

Shaw Environmental Solutions

Manager Christopher Long

Location Code OTC531B (Bldg 921)

RFA / COC Number 144106-H013

Sample Number ~~OTC531~~-IS-0006-~~MMDDYY~~
OTC531B 071112

Task

Sample Name OTC531-z-OTC531-IS-0006-MMDDYY-z

Collection Date 071112

Sampling Method ~~Unknown~~ Hand Auger

Sample Type ~~Unknown~~ Grab

Collection Time 0910

Sample Purpose ~~Unknown~~ Invest.

Start Depth 3'

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Hand Auger

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw EMS

Logged By / Dat Chase Hill 07/11/12

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

* STATION 3

Shaw a world of Solutions

Manager Christopher Long

Location Code OTC531B (Bldg 921)

RFA / COC Number 144106 - H013

Sample Number ~~OTC531~~-IS-0007-~~MMDDYY~~
OTC531B 071112

Task

Sample Name OTC531-z-OTC531-IS-0007-MMDDYY-z

Collection Date 071112

Sampling Method ~~Unknown~~ DPT Invest.

Sample Type ~~Unknown~~ Grab

Collection Time 0920

Sample Purpose ~~Unknown~~

Start Depth 10'

End Depth 12'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sample Matrix SOIL

Sampling Equip Geoprobe

QC Partners:
(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase Hill 07/11/12

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw Environmental & Infrastructure Solutions

Manager Christopher Long

* STATION 4

Location Code OTC531B (Bldg 921)

RFA / COC Number 144106-H013

Sample Number ~~OTC531-~~IS-0008-~~MMDDYY~~ OTC531B 071112

Task

Sample Name OTC531-z-OTC531-IS-0008-MMDDYY-z

Collection Date 071112

Sampling Method ~~Unknown~~ Hand Auger

Sample Type ~~Unknown~~ Grab

Collection Time 0930

Sample Purpose ~~Unknown~~ Invest.

Start Depth 3'

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Hand Auger

Sample Matrix SOIL

QC Partners:
(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chris Long 07/11/12 Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw Environmental Solutions

Manager Christopher Long

STATION 4

Location Code OTC531B (Bldg 921)

RFA / COC Number 144106 - H013

Sample Number ~~OTC531~~-IS-0009-~~MMDDYY~~
OTC531B 071112

Task

Sample Name OTC531-z-OTC531-IS-0009-MMDDYY-z

Collection Date 07 11 12

Sampling Method ~~Unknown~~ DPT Invest.

Sample Type ~~Unknown~~ Grab

Collection Time 1000

Sample Purpose ~~Unknown~~

Start Depth 10'

End Depth 12'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chris Hill 07/11/12 Reviewed By / Dat

Sample Collection Log

Shaw A world of Solutions

- Holloman AFB

Manager Christopher Long

* STATION 4

Location Code OTC531B (Bldg 921) RFA / COC Number 144106 - H013

Sample Number ~~OTC531~~-IS-0010-~~MMDDYY~~ OTC531B 071112

Task

Sample Name OTC531-z-OTC531-IS-0010-MMDDYY-z

Collection Date 071112

Sampling Method ~~Unknown~~ Hand Auger

Sample Type ~~Unknown~~ Grab

Collection Time 1010

Sample Purpose ~~Unknown~~ Invest.

Start Depth 0'

End Depth 2'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Hand Auger

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chase Hill 07/11/12 Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw — A world of Solutions

Manager Christopher Long

* STATION 4

Location Code OTC531 B (Bldg 921)

RFA / COC Number 144106 - H013

Sample Number ~~OTC531~~-IS-0011-~~MMDDYY~~ OTC531B 071112

Task

Sample Name OTC531-z-OTC531-IS-0011-MMDDYY-z

Collection Date 071112

Sampling Method ~~Unknown~~ DPT Invest.

Sample Type ~~Unknown~~ Grab

Collection Time 1015

Sample Purpose ~~Unknown~~

Start Depth 10'

End Depth 12'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geopcobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chad Hill 07/11/12

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager **Christopher Long**

Location Code **OTC531B** (Bldg 921) RFA / COC Number 144106-H100

Sample Number ~~OTC531-GW-5311-MMDDYY~~ OTC531B-GW-5311-081412 Task

Sample Name **OTC531-z-OTC531-GW-5311-MMDDYY-z** Collection Date 08/14/12

Sampling Method ~~Unknown~~ micropurge Sample Type ~~Unknown~~ grab Collection Time 0905

Sample Purpose ~~Unknown~~ Invest. Start Depth 14'

QC Code **NORMAL ENVIRONMENTAL SAMPL** End Depth 14'

Sampling Equip QED Bladder Pump Sample Matrix **GROUND WATER**

QC Partners:

(TB) TB-100 (EB) _____ (FB) _____ SampleTeam Chase Hill

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SW8015B : GRO	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	C	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
SW8015B : ORO	D	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015B : DRO	D	Unknown	2	1	L	1 Liter Amber Glass	H2SO4
PCBs by SW8082A	E	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Explosives by SW8330A	F	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Tritium by 906.0 Mod	G	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Mercury by SW7470A	H	Unknown	0	500	ML	500 ml Poly Container	HNO3
Metals by SW6020A	H	Unknown	0	500	ML	500 ml Poly Container	HNO3
Metals by SW6010C	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
Total CN water by 335.4	I	Unknown	1	500	ML	500 ml Poly Container	NaOH
TDS by 160.1	J	Unknown	1	500	ML	500 ml Poly Container	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chase Hill 08/14/12 Reviewed By / Dat _____

Sample Collection Log

IDW Soil

Shaw Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code ~~FIELDQC~~ IDW

RFA / COC Number HO 38

Sample Number ~~OTC644-GW-0111-MMDDYY-FD~~ LDY-IDW01-090412

Sample Name ~~FIELDQC-2-OTC644-GW-0111-MMDDYY-FD-z~~

Task

Collection Date 09/04/2012

Sampling ~~Unknown~~ Composite *Method*

Sample Type ~~Unknown~~ Soil

Collection Time 1330

Sample Purpose ~~Unknown~~ IDW characterization

Start Depth NA

QC Code ~~FIELD DUPLICATE~~ NA

End Depth NA

Sampling Equip Stainless steel Trowel/Bowl/Aluminum

Sample Matrix ~~GROUND WATER~~ IDW Soil

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam LaThom, Hodu

Containers:

	Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
1)	VOCs by SW8260C TCLP VOCs	A	Unknown	~~3~~ 1	~~40~~ 8oz	~~ML~~	~~40 ml VOA Vials~~ Glass	~~HCL~~ Cool to 4°C
	~~SW8015B : GRO~~	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
2)	SVOCs by SW8270D TCLP SVOCs / other organics	EB	Unknown	~~2~~ 1	8	x oz	~~1 Liter Amber Glass~~ Glass	Cool to 4°
	~~SW8015B : GRO~~	D	Unknown	0	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~SW8015B : DRO~~	D	Unknown	2	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~PCBs by SW8082A~~ ~~Cancel~~	E	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
	~~Explosives by SW8330A~~	F	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
3)	~~Tritium by 906.0 Mod~~ RCI	C	Unknown	~~2~~ 1	8oz		~~1 Liter Amber Glass~~ Glass	~~Cool to 4°C~~ Cool to 4°C
4)	Mercury by SW7470A TCLP Mercury	~~F~~ D	Unknown	~~2~~ 1	~~500~~ 8oz	~~ML~~ oz	500 ml Poly Container Glass	~~HNO3~~ Cool to 4°C
5)	Metals by SW6020A TCLP Metals	~~H~~ E	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~	500 ml Poly Container Glass	~~HNO3~~ Cool to 4°C
	~~Metals by SW6010C~~	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
	~~Total CN water by 335.4~~	I	Unknown	1	500	ML	500 ml Poly Container	NaOH
	~~TDS by 160.1~~	J	Unknown	1	500	ML	500 ml Poly Container	Cool to 4°

Comments: Composite Soil sample for TCLP analyses of IDW cuttings rolloff at Lay down Yard, 09/04/12

Sketch Location: Rolloff box Composite Sample @ Lay down Yard.

Analyses: TCLP VOCs, TCLP SVOCs, TCLP metals, TCLP Mercury, RCI

LDY = Lay down Yard

~~Shaw~~ *Logged By / Dat* Mel Hall *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager **Christopher Long**

Location Code BULK WATER TANK

Sample Number HAFB-IDW-BULKWATER-0001-111612

Sample Name HAFB-IDW-BULKWATER-0001-111612

RFA / COC Number 144106 H070

Task 144106.JM20000

Collection Date 11/16/12

Sampling Method BAILER

Sample Type GRAB

Collection Time 13:00

Sample Purpose CONFIRM IDW

QC Code EQUIPMENT BLANK

Start Depth N/A

End Depth N/A

Sampling Equip DISPOSABLE BAILER

Sample Matrix **WATER**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam JH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	B	Unknown	4	8	OZ	8OZ Amber Glass	Cool to 4°
SW8015 : ORO	C	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015 : DRO	C	Unknown	1	1	L	1 Liter Amber Glass	H2SO4
Metals by SW6020A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
METALS by SW6020A	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Mercury by SW7470A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Metals by SW6010C	D	Unknown	1	500	ML	500 ml Poly Container	HNO3
	E		1	500	ML	500 ml Poly Cont	Cool to 4°
SW8015 : GRO	F	Unknown	3	40	ML	40 ml VOA Vials	HCL

Comments: SAMPLE COLLECTED FROM BULK WATER STORAGE TANK AFTER ALL WATER DRUMS WERE CONSOLIDATED. SENT BOTH A PRESERVED AND UNPRESERVED 500ML POLY FOR METALS. SPOKE WITH LAB AND THEY SAID TO SEND UNPRESERVED, BUT I THINK MAYBE THEY MADE A MISTAKE.

Sketch Location:

Shaw *Logged By / Dat* _____ *Reviewed By / Dat* _____

Sample Collection Log

- HOLLOMAN AFB

MW01 Groundwater

Manager **CHRISTOPHER LONG**

Location Code **OTC531** B (Bldg 921)

RFA / COC Number 174106-HO80

Sample Number **OTC531B-GW-531B2** ~~MMDDYY~~ 051513

Logging Co

Collection Date 5/15/13

Sampling Method **UNKNOWN** Micropurge

Collection Time 1545

Sample Type **GRAB**

Sample Purpose **INVESTIGATOR**

Start Depth NA

QC Code **NORMAL ENVIRONMENTAL SAMPL**

End Depth NA

Sampling Equip GED bladder pump

Sample Matrix **GROUND WATER**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam CL, TK

Containers:

Analytical Suite	Frtn	Filtered	Qty	Container Type	Perservative	Lab
VOCS SW8260C	A	TOTAL	3	40 ML VOA VIALS	HCL	:CUTEST LABS, ORLA
SW8015B : GRO	B	TOTAL	3	40 ML VOA VIALS	HCL	:CUTEST LABS, ORLA
SVOCS SW8270D	C	TOTAL	2	LITER AMBER GLAS:	COOL TO 4°	:CUTEST LABS, ORLA
SW8015B : ORO	D	TOTAL	0	LITER AMBER GLAS:	H2SO4	:CUTEST LABS, ORLA
SW8015B : DRO	D	TOTAL	2	LITER AMBER GLAS:	H2SO4	:CUTEST LABS, ORLA
PCBS SW8082A	E	TOTAL	2	LITER AMBER GLAS:	COOL TO 4°	:CUTEST LABS, ORLA
EXPLOSIVES SW8330A	F	TOTAL	2	LITER AMBER GLAS:	COOL TO 4°	:CUTEST LABS, ORLA
TRITIUM 906.0 MOD	G	TOTAL	2	LITER AMBER GLAS:	COOL TO 4°	:CUTEST LABS, ORLA
TOTAL CN WATER 335.4	H	TOTAL	1	500 ML POLY CONTAINI	NAOH	:CUTEST LABS, ORLA
TDS 160.1	I	TOTAL	1	500 ML POLY CONTAINI	COOL TO 4°	:CUTEST LABS, ORLA
METALS SW6010C	J	TOTAL	0	500 ML POLY CONTAINI	HNO3	:CUTEST LABS, ORLA
METALS SW6020A	J	TOTAL	0	500 ML POLY CONTAINI	HNO3	:CUTEST LABS, ORLA
MERCURY SW7470A	J	TOTAL	1	500 ML POLY CONTAINI	HNO3	:CUTEST LABS, ORLA

Comments: Sample taken from OTC531B-MW01

Sketch Location:

Logged By / Date: Tara Kruftel

Reviewed By / Date: C Gallier

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager **Christopher Long**

* STATION 1

Location Code **OTC531C** (Bldg 922)

RFA / COC Number 144106-H015

Task

Sample Number ~~OTC531~~-IS-0001-~~MMDDYY~~
OTC531C 071312

Collection Date 071312

Sample Name **OTC531-z-OTC531-IS-0001-MMDDYY-z**

Sampling Hand Auger ~~Unknown~~

Method Invest.

Sample Type Grab ~~Unknown~~

Collection Time 0820

Start Depth 3'

Sample Purpose ~~Unknown~~

End Depth 5'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sample Matrix **SOIL**

Sampling Equip Hand Auger

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/LL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Charlie Hill 07/13/12

Reviewed By / Dat _____

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager **Christopher Long**

* STATION 1

Location Code **OTC531C** (Bldg 922)

RFA / COC Number 144106-H015

Sample Number ~~OTC531~~-IS-0002-~~MMDDYY~~ OTC531C 071312

Task

Sample Name **OTC531-z-OTC531-IS-0002-MMDDYY-z**

Collection Date 071312

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0850

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10'

End Depth 12'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sampling Equip Geoprobe

Sample Matrix **SOIL**

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chris Long 07/13/12 Reviewed By / Dat _____

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager **Christopher Long**

* STATION 2

Location Code **OTC531** C (Bldg 922)

RFA / COC Number 144106 - H015

Sample Number ~~OTC531~~-IS-0003-~~MMDDYY~~
OTC531C 071312

Task

Sample Name **OTC531-z-OTC531-IS-0003-MMDDYY-z**

Collection Date 071312

Sampling Method ~~Unknown~~ DPT Invest.

Sample Type ~~Unknown~~ Grab

Collection Time 0920

Start Depth 7'

Sample Purpose ~~Unknown~~

End Depth 9'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sampling Equip Geoprobe

Sample Matrix **SOIL**

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chanel Hill 07/13/12

Reviewed By / Dat _____

Sample Collection Log

- Holloman AFB

* STATION 2

Shaw a world of Solutions

Manager **Christopher Long**

Location Code **FIELDQC**

RFA / COC Number 144106 - H015

Task

Sample Number ~~OTC531~~-IS-0004-~~MMDDYY~~-FD
OTC531C 071312

Sample Name **FIELDQC-z-OTC531-IS-0004-MMDDYY-FD-z**

Collection Date 071312

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0920

Sample Purpose ~~Unknown~~ Field QC

Start Depth 7'

End Depth 9'

QC Code **FIELD DUPLICATE**

Sample Matrix **SOIL**

Sampling Equip Geoprobe

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chad Hill 07/13/12 *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager **Christopher Long**

* STATION 2

Location Code **OTC531C** (Bldg 922)

RFA / COC Number 144106. H015

Task

Sample Number ~~OTC531-IS-0005-MMDDYY~~ OTC531C 071312

Sample Name **OTC531-z-OTC531-IS-0005-MMDDYY-z**

Collection Date 071312

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0925

Sample Purpose ~~Unknown~~ Invest.

Start Depth 14'

End Depth 16'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sampling Equip Geoprobe

Sample Matrix **SOIL**

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/LL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chris Hill 07/13/12

Reviewed By / Dat _____

Sample Collection Log

- Holloman AFB

* STATION 3

Shaw a world of Solutions

Manager **Christopher Long**

Location Code **OTC531C** (Bldg 922)

RFA / COC Number 144106 - H015

Sample Number ~~OTC531-IS-0006-MMDDYY~~ OTC531C 071312

Task

Sample Name **OTC531-z-OTC531-IS-0006-MMDDYY-z**

Collection Date 071312

Sampling Method ~~Unknown~~ Hand Auger (Invest.)

Sample Type ~~Unknown~~ Grab

Collection Time 0935

Sample Purpose ~~Unknown~~

Start Depth 3'

End Depth 5'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sample Matrix **SOIL**

Sampling Equip Hand Auger

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Hill 07/13/12 *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

* STATION 3

Shaw a world of Solutions

Manager **Christopher Long**

Location Code **OTC531C** (Bldg 922)

RFA / COC Number 144106-HO15

Sample Number ~~OTC531~~-IS-0007-~~MMDDYY~~ OTC531C 071312

Task

Sample Name **OTC531-z-OTC531-IS-0007-MMDDYY-z**

Collection Date 071312

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0945

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10'

End Depth 12'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sampling Equip Geoprobe

Sample Matrix **SOIL**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam CH/LL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Hill 07/13/12 *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

* STATION 4

Shaw a world of Solutions

Manager **Christopher Long**

Location Code **OTC531C** (Bldg 922)

RFA / COC Number 144106-H015

Sample Number ~~OTC531~~-IS-0008-~~MMDDYY~~ OTC531C 071312

Sample Name **OTC531-z-OTC531-IS-0008-MMDDYY-z**

Task

Collection Date 071312

Sampling Method ~~Unknown~~ Hand Auger Invest.

Sample Type ~~Unknown~~ Grab

Collection Time 1028

Sample Purpose ~~Unknown~~

Start Depth 3'

End Depth 5'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sampling Equip ~~Geoprobe~~ Hand Auger

Sample Matrix **SOIL**

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chris Long 07/13/12

Reviewed By / Dat _____

Sample Collection Log

- Holloman AFB

* STATION 4

Shaw a world of Solutions

Manager **Christopher Long**

Location Code **OTC531C** (Bldg 922)

RFA / COC Number 144106-H015

Task

Sample Number ~~OTC531~~-IS-0009-~~MMDDYY~~ OTC531C 071312

Sample Name **OTC531-z-OTC531-IS-0009-MMDDYY-z**

Collection Date 071312

Collection Time 1025

Sampling Method ~~Unknown~~ DPT Invest.

Sample Type ~~Unknown~~ Grab

Start Depth 10'

Sample Purpose ~~Unknown~~

End Depth 12'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sample Matrix **SOIL**

Sampling Equip Geoprobe

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	)(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chris Tait 07/13/12 Reviewed By / Dat _____

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager **Christopher Long**

* STATION 4

Location Code **OTC531C (Bldg 922)**

RFA / COC Number 144106 - H015

Sample Number ~~OTC531~~-IS-0010-MM~~DDYY~~ OTC531C 071312

Task

Sample Name **OTC531-z-OTC531-IS-0010-MMDDYY-z**

Collection Date 071312

Sampling Method ~~Unknown~~ Hand Auger Invest.

Sample Type ~~Unknown~~ Grab

Collection Time 1030

Sample Purpose ~~Unknown~~

Start Depth 0'

End Depth 2'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sampling Equip Hand Auger

Sample Matrix **SOIL**

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	)(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chase Hill 07/13/12 Reviewed By / Dat _____

Sample Collection Log

- Holloman AFB

* STATION 4

Shaw a world of Solutions

Manager **Christopher Long**

Location Code **OTC531C** (Bldg 922)

RFA / COC Number 144106-14015

Sample Number ~~OTC531-IS-0011-MMDDYY~~ OTC531C 071312

Sample Name **OTC531-z-OTC531-IS-0011-MMDDYY-z**

Task

Collection Date 071312

Sampling Method ~~Unknown~~ DPT Invest.

Sample Type ~~Unknown~~ Grab

Collection Time 1025

Sample Purpose ~~Unknown~~

Start Depth 10'

End Depth 12'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sampling Equip Geoprobe

Sample Matrix **SOIL**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	)(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Hill 01/13/12 *Reviewed By / Dat* _____

MW01 Groundwater

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager **Christopher Long**

Location Code **OTC531C** (Bldg 922) *RFA / COC Number* 144106 – H100

Sample Number ~~OTC531-GW-5311-MMDDYY~~ OTC531C-GW-5311-081412 *Task*

Sample Name **OTC531-z-OTC531-GW-5311-MMDDYY-z** *Collection Date* 08/14/12

Sampling Method ~~Unknown~~ micropurge *Sample Type* ~~Unknown~~ Grab *Collection Time* 1052

Sample Purpose ~~Unknown~~ Invest. *Start Depth* 14'

QC Code **NORMAL ENVIRONMENTAL SAMPL** *End Depth* 14'

Sampling Equip QED Bladder Pump *Sample Matrix* **GROUND WATER**

QC Partners:

(TB) TB-100 *(EB)* _____ *(FB)* _____ *SampleTeam* Chase Hill

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SW8015B : GRO	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	C	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
SW8015B : ORO	D	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015B : DRO	D	Unknown	2	1	L	1 Liter Amber Glass	H2SO4
PCBs by SW8082A	E	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Explosives by SW8330A	F	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Tritium by 906.0 Mod	G	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Mercury by SW7470A	H	Unknown	0	500	ML	500 ml Poly Container	HNO3
Metals by SW6020A	H	Unknown	0	500	ML	500 ml Poly Container	HNO3
Metals by SW6010C	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
Total CN water by 335.4	I	Unknown	1	500	ML	500 ml Poly Container	NaOH
TDS by 160.1	J	Unknown	1	500	ML	500 ml Poly Container	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Hill 08/14/12 *Reviewed By / Dat* _____

Sample Collection Log

IDW Soil

Shaw Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code ~~FIELDQC~~ IDW *RFA / COC Number* HO 38

Sample Number ~~OTC644-GW-0111-MMDDYY-FD~~ LDY-IDWD1-090412

Sample Name ~~FIELDQC-2-OTC644-GW-0111-MMDDYY-FD-z~~ *Task*

Collection Date 09/04/2012

Sampling Method ~~Unknown~~ Composite *Sample Type* ~~Unknown~~ Soil

Collection Time 1330

Sample Purpose ~~Unknown~~ IDW characterization *Start Depth* NA

QC Code ~~FIELD DUPLICATE~~ NA *End Depth* NA

Sampling Equip Stainless steel Trowel/Bowl Aluminum *Sample Matrix* ~~GROUND WATER~~ IDW Soil

QC Partners:

(TB) _____ (EB) _____ (FB) _____ *SampleTeam* LaThom, Hodu

Containers:

	Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
1)	VOCs by SW8260C TCLP VOCs	A	Unknown	~~3~~ 1	~~40~~ 8oz	~~ML~~	~~40 ml VOA Vials~~ Glass	~~HCL~~ Cool to 4°C
	~~SW8015B : GRO~~	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
2)	SVOCs by SW8270D TCLP SVOCs / other organics	EB	Unknown	~~2~~ 1	8	x oz	~~1 Liter Amber Glass~~ Glass	Cool to 4°
	~~SW8015B : GRO~~	D	Unknown	0	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~SW8015B : DRO~~	D	Unknown	2	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~PCBs by SW8082A~~ ~~TCLP~~	E	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
	~~Explosives by SW8330A~~	F	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
3)	~~Tritium by 906.0 Mod~~ RCI	C	Unknown	~~2~~ 1	~~1~~ 8oz	~~L~~	~~1 Liter Amber Glass~~ Glass	~~Cool to 4°C~~
4)	Mercury by SW7470A TCLP Mercury	~~F~~ D	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~ oz	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
5)	Metals by SW6020A TCLP Metals	~~H~~ E	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
	~~Metals by SW6010C~~	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
	~~Total CN water by 335.4~~	I	Unknown	1	500	ML	~~500 ml Poly Container~~	NaOH
	~~TDS by 160.1~~	J	Unknown	1	500	ML	500 ml Poly Container	Cool to 4°

Comments: Composite soil sample for TCLP analyses of IDW cuttings rolloff at Laydown Yard, 09/04/12

Sketch Location: Rolloff box Composite Sample @ Laydown Yard.

Analyses: TCLP VOCs, TCLP SVOCs, TCLP metals, TCLP Mercury, RCI

LDY = Laydown Yard

~~Shaw~~ *Logged By / Dat* Mel Hall *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager **Christopher Long**

Location Code BULK WATER TANK

Sample Number [redacted] HAFB-IDW-BULKWATER-0001-111612

Sample Name [redacted] HAFB-IDW-BULKWATER-0001-111612

RFA / COC Number 144106 H070

Task 144106 .JM20000

Collection Date 11/16/12

Sampling Method [redacted] BAILER

Sample Type [redacted] GRAB

Collection Time 13:00

Sample Purpose [redacted]

QC Code CONFIRM IDW [redacted]

Start Depth N/A

End Depth N/A

Sampling Equip DISPOSABLE BAILER

Sample Matrix **WATER**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam JH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	B	Unknown	[redacted] 4	[redacted] 8	[redacted] OZ	8OZ [redacted] Amber Glass	Cool to 4°
SW8015 : ORO	C	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015 : DRO	C	Unknown	[redacted] 1	1	L	1 Liter Amber Glass	H2SO4
Metals by SW6020A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
METALS by SW6020A	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Mercury by SW7470A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Metals by SW6010C	D	Unknown	1	500	ML	500 ml Poly Container	HNO3
	E		1	500	ML	500 ml Poly Cont	Cool to 4°
SW8015 : GRO	[redacted] F	Unknown	3	40	ML	40 ml VOA Vials	HCL

Comments: Sample collected from Bulk water Storage tank after all water drums were consolidated. Sent both a preserved and unpreserved 500ml Poly for Metals. Spoke with Lab and they said to send unpreserved, but I think maybe they made a mistake.

Sketch Location:

Shaw *Logged By / Dat* [signature] *Reviewed By / Dat* _____

Appendix E
Boring Logs

Boring ID: OT-C531A-Station 1

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 920

Date Completed: 7/10/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Ground Elevation AMSL (ft):4047.24
Y Coordinate: 669454.4647
X Coordinate: 1678198.5067

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		Silty SAND (SM); tan (7.5 YR 7/3); dry; loose; very fine sand.	SM	Hand auger from 0 - 5 ft. Began drilling on 7/10/12.
5		OTC531A-IS-0001-071012	NR		Same as above (0 ft); white (2.5 YR 9/2). Note: hard caliche layers 1 - 2" thick.		
10					Same as above (0 ft); moist; very fine sand.		
		OTC531A-IS-0002-071012	NR		▽ Same as above (0 ft); wet.		Wet @ 11.5 ft.
15			NR				Total depth = 15 ft. Reached total depth on 7/10/12.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:44 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C531A-Station 2

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 920

Date Completed: 7/10/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Ground Elevation AMSL (ft):4048.59
Y Coordinate: 669421.2823
X Coordinate: 1678205.4397

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		Silty SAND (SM); tan (7.5YR 7/3); dry; loose; very fine sand; silty. Note: hard caliche layers.	SM	Hand auger from 0 - 5 ft. Began drilling on 7/10/12.
5			NR		SILT (ML); tan; dry; loose; sandy.		
10		OTC531A-IS-0003-071012 and OTC531A-IS-0004-071012-FD	NR		Same as above (5 ft); white (2.5YR 9/2); dry; loose. Note: gypsum present.	ML	
15		OTC531A-IS-0005-071012	NR		Same as above (5 ft); moist to wet; very fine sand. ▽ Same as above (5 ft); saturated.		Saturated @ 15 ft.
20			NR		Lean CLAY; pale red (2.5YR 7/2); dry; firm; silty.	CL	
25					Same as above (18 ft); reddish brown (2.5YR 5/4).		Total depth = 20 ft. Reached total depth on 7/10/12.
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:45 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C531A-Station 3

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 920

Date Completed: 7/10/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Ground Elevation AMSL (ft):4048.42
Y Coordinate: 669412.9478
X Coordinate: 1678204.6499

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); tan; loose; trace white sand; trace gypsum. Note: hard caliche layer with pellets.		Hand auger from 0 - 5 ft. Began drilling on 7/10/12.
5		OTC531A-IS-0006-071012	NR		Same as above (0 ft); tan to white; dry; loose; trace sand; trace gypsum.		
10					Same as above (0 ft); tan; trace clay.	ML	
		OTC531A-IS-0007-071012	NR		Same as above (0 ft); white; moist; clayey. Note: gypsum present.		
15			NR		Sandy SILT (ML); tan; moist. ▽ Same as above (12 ft); wet.		Wet @ 14 ft. Total depth = 15 ft. Reached total depth on 7/10/12.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:45 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C531A-Station 4 (OTC531A-MW01)

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 920

Date Completed: 7/10/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Top of PVC Riser Pipe AMSL (ft): 4047.38
Y Coordinate: 669365.2056
X Coordinate: 1678169.3241

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0		OTC531A-IS-0010-071012	NR		SILT (ML); tan; dry; soft; trace sand; trace clay.	ML	Hand auger from 0 - 5 ft. Began drilling on 7/10/12.
5		OTC531A-IS-0008-071012 and OTC531A-IS-0010-071012-MS and OTC531A-IS-0010-071012-MSD	NR		Poorly graded GRAVEL (GP); gray; fine to medium gravel.	GP	
10					SILT (ML); light tan to white; dry; soft; trace clay.		
		OTC531A-IS-0009-071012	NR		Same as above (6 ft); white; clayey. Note: 6" fine gravel layer @ 10 -10.5 ft.	ML	
15		OTC531A-IS-0011-071012	NR		▽ Same as above (6 ft); white to tan; soft; trace clay; sandy.		Wet @ 13.5 - 16 ft.
20			NR		Lean CLAY (CL); greenish gray; moist; firm.	CL	
					Same as above (16 ft); reddish brown to light gray; moist; low plasticity; silty; trace gravel. Note: gypsum present.		Total depth = 20 ft. Reached total depth on 7/10/12.
25							
30							

Boring ID: OT-C531B-Station 1

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 921

Date Completed: 7/11/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Ground Elevation AMSL (ft):4045.69
Y Coordinate: 668910.2205
X Coordinate: 1678301.2209

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); tan to white; soft; clayey. Note: hard caliche layers (1 - 2" thick).	ML	Hand auger from 0 - 5 ft. Began drilling on 7/11/12.
5		OTC531B-IS-0001-071112			Lean CLAY (CL); white to tan; dry; soft. Note: hard caliche.	CL	
			NR		Same as above (0 ft); tan; dry; trace caliche.	ML	
10					Same as above (3 ft); white; dry to moist; low plasticity; silty; trace caliche.	CL	Moist @ 9 ft.
		OTC531B-IS-0002-071112	NR		Same as above (3 ft); moist; silty.		Wet @ 11 ft.
					Same as above (0 ft); mottled white and tan; wet; trace fine sand.	ML	
15			NR		Same as above (3 ft); saturated.	CL	Saturated @ 13.5 ft.
							Total depth = 15 ft. Reached total depth on 7/11/12.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:45 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C531B-Station 2

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 921

Date Completed: 7/11/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Ground Elevation AMSL (ft):4046.52
Y Coordinate: 668877.0581
X Coordinate: 1678315.4298

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); medium brown; dry; soft; trace sand; trace gypsum. Note: occasional hard caliche layers.		Hand auger from 0 - 5 ft. Began drilling on 7/11/12.
5			NR		Same as above (0 ft); fine to coarse gravel lens.		
		OTC531B-IS-0003-071112 and OTC531B-IS-0004-071112-FD				ML	
10			NR		Same as above (0 ft); white; caliche.		
					Same as above (0 ft); wet; Note: 2" thin brown sandy silt layer.		Wet @ 11.5 ft.
					▽		Saturated @ 13 ft.
15		OTC531B-IS-0005-071112	NR		Same as above (0 ft); tan; wet; trace clay; sand.		
					Lean CLAY (CL); pale olive (5Y 6/4); moist; medium plasticity.	CL	Total depth = 20 ft. Reached total depth on 7/11/12.
20			NR				
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:45 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C531B-Station 3

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 921

Date Completed: 7/11/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Ground Elevation AMSL (ft):4046.24
Y Coordinate: 668867.5739
X Coordinate: 1678300.7031

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); brown (7.5YR 5/4); soft; trace clay; trace sand.		Hand auger from 0 - 5 ft. Began drilling on 7/11/12.
5		OTC531B-IS-0006-071112	NR		Same as above (0 ft); light brown to mottled white; dry.	ML	
10		OTC531B-IS-0007-071112	NR		Same as above (0 ft); slightly moist; low plasticity. Note: clay content increasing.		
15			NR		Silty SAND (SM); wet; loose; very fine sand.	SM	Wet @ 12 - 14 ft.
20							Total depth = 15 ft. Reached total depth on 7/11/12.
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:45 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C531B-Station 4 (OTC531B-MW01)

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 921

Date Completed: 7/11/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Top of PVC Riser Pipe AMSL (ft): 4045.98
Y Coordinate: 668828.3842
X Coordinate: 1678273.9538

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0		OTC531B-IS-0010-071112	NR		Sitly SAND (SM); medium brown; dry; loose.	SM	Hand auger from 0 - 5 ft. Began drilling on 7/11/12.
5		OTC531B-IS-0008-071112	NR		Same as above (0 ft). Note: 3 - 4" fine gravel layer @ 2.7 ft. Gravel is composed of sandstone.		
10					Same as above (0 ft); light brown to mottled white.		Hard caliche layers @ 7 - 12 ft. Slow penetration rate.
15		OTC531B-IS-0009-071112 and OTC531B-IS-0011-071112	NR		Same as above (0 ft); white to tan; moist to wet; very fine sand.		Wet @ 12 ft.
20			NR		Same as above (0 ft); tan; wet; very fine sand. ▽ Same as above (0 ft); tan; saturated.		Saturated @ 17 ft.
25							Total depth = 20 ft. Reached total depth on 7/11/12.
30							

Boring ID: OT-C531C-Station 1

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 922

Date Completed: 7/13/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Ground Elevation AMSL (ft):4045.66
Y Coordinate: 668368.2296
X Coordinate: 1678403.9881

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); white; soft; clayey. Note: hard caliche lenses.		Hand auger from 0 - 5 ft. Began drilling on 7/13/12.
					Same as above (0 ft); tan; trace sand.	ML	
5		OTC531C-IS-0001-071312	NR		Same as above (0 ft); reddish brown; dry.		
10		OTC531B-IS-0002-071312	NR		Silty SAND (SM); white; dry; loose; very silty; trace clay.		
					Same as above (8 ft); tan; wet; very fine sand; trace clay.	SM	Water @ 11 ft.
15			NR				Total depth = 15 ft. Reached total depth on 7/13/12.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:45 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C531C-Station 2

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 922

Date Completed: 7/13/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Ground Elevation AMSL (ft):4046.55
Y Coordinate: 668337.4955
X Coordinate: 1678415.4998

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		Silty SAND (SM); tan; dry; loose; very fine sand. Note: occasional hard caliche lenses.	SM	Hand auger from 0 - 5 ft. Began drilling on 7/13/12.
					Same as above (0 ft); white.		
5			NR		SILT (ML); light brown to mottled white; dry; soft; clayey; trace sand.	ML	
		OTC531C-IS-0003-071312 and OTC531C-IS-0004-071312-FD			Same as above (0 ft); white; silty.		
10			NR		Same as above (0 ft); white; wet; silty.	SM	Wet @ 12 - 16 ft.
15		OTC531C-IS-0005-071312	NR		Same as above (0 ft); saturated.		Saturated @ 16 - 18 ft.
					Same as above (0 ft); mottled orange.		
20			NR		Lean CLAY (CL); light brown; dry; low plasticity; silty.	CL	Total depth = 20 ft. Reached total depth on 7/13/12.
					Sandy lean CLAY (CL); wet.		
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:45 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C531C-Station 3

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 922

Date Completed: 7/13/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Ground Elevation AMSL (ft):4045.84
Y Coordinate: 668329.2095
X Coordinate: 1678406.9323

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); dry; soft; trace clay; trace very fine sand. Note: occasional hard caliche (1 - 2" layers) with gypsum crystals.	ML	Hand auger from 0 - 5 ft. Began drilling on 7/13/12.
5		OTC531C-IS-0006-071312	NR		Same as above (0 ft).		
					Lean CLAY (CL); red; dry; low plasticity; silty.	CL	
10					Silty SAND (SM); white to light gray; dry; loose; trace clay.	SM	
		OTC531C-IS-0007-071312	NR		▽ Same as above (8 ft); saturated.		
15			NR				Total depth = 15 ft. Reached total depth on 7/13/12.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:46 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C531C-Station 4 (OTC531C-MW01)

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 922

Date Completed: 7/13/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Top of PVC Riser Pipe AMSL (ft): 4045.45
Y Coordinate: 668288.4318
X Coordinate: 1678381.8235

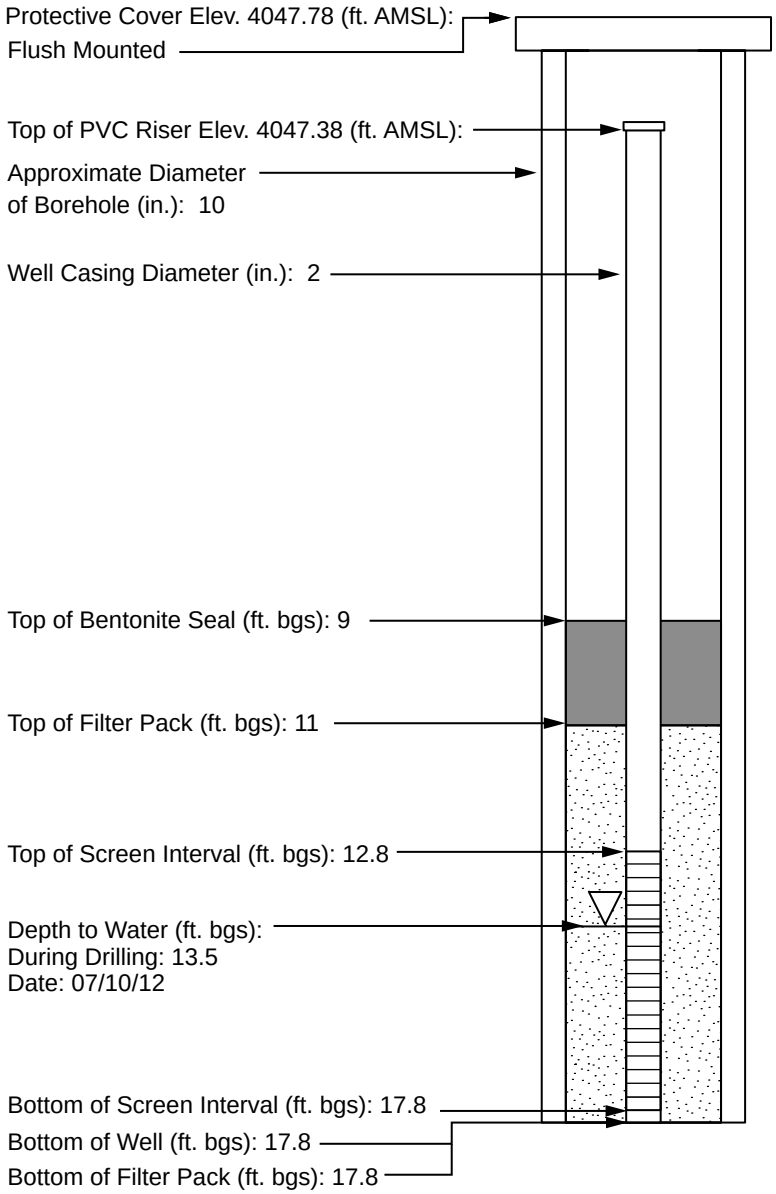
Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0		OTC531C-IS-0010-071312	NR		SILT (ML); tan; dry; soft; trace clay; trace sand. Note: hard 1 - 2" caliche layer @ 3 ft.	ML	Hand auger from 0 - 5 ft. Began drilling on 7/13/12.
5		OTC531C-IS-0008-071312	NR		Same as above (0 ft); reddish brown; clayey.		
10					Silty SAND (SM); buff; dry; loose; trace clay.	SM	
		OTC531C-IS-0009-071312 OTC531C-IS-0011-071312	NR		Same as above (8 ft); wet.		Void @ 11 ft. Wet @ 12.7 ft.
15			NR				Total depth = 15 ft. Reached total depth on 7/13/12.
20							
25							
30							

Appendix F
Well Construction Diagrams

Well Construction Diagram

Project: Holloman AFB
Location: OT-C531A
Client: USAF
Subcontractor: Major Drilling
Driller: K. Burkhead
Drilling Method/Rig Type: DPT/Auger
Shaw Field Representative: M. Hardner

Well Number: OTC531A-MW01
Site Location: Building 920
Installation Date: 07/10/2012
Completion Date: 07/10/2012
Grid Northing: 669365.2056
Grid Easting: 1678169.3241
NAD: 83 SPCS NM Central
NAVD: 88



Not To Scale

Protective Casing: Circular
Type: Flush Mount
Dimensions (in.): 8
Length (in): 10
Guard Post: NA

Ground Seal (Surface pad):
Dimensions (ft.): 2 x 2
Type: Concrete

Annular Space Seal:
Type: Quikcrete and Quikgel Bentonite
Installation: Gravity

Bentonite Seal:
Manufacturer: Enviro Plug
# of Bags: 2 (50 lbs each)
Type: 3/8" Pellets
Installation: Gravity
Hydration time (hrs): 1

Filter Pack Material:
Manufacturer: DSI
Product Name: Well Gravel Pack
Size: GP#3
# of bags: 3 (50 lbs each)
Installation: Gravity

Well Casing Used (ft.):
Manufacturer: Silverline
Type: PVC Schedule 40
Diameter (in.): 2

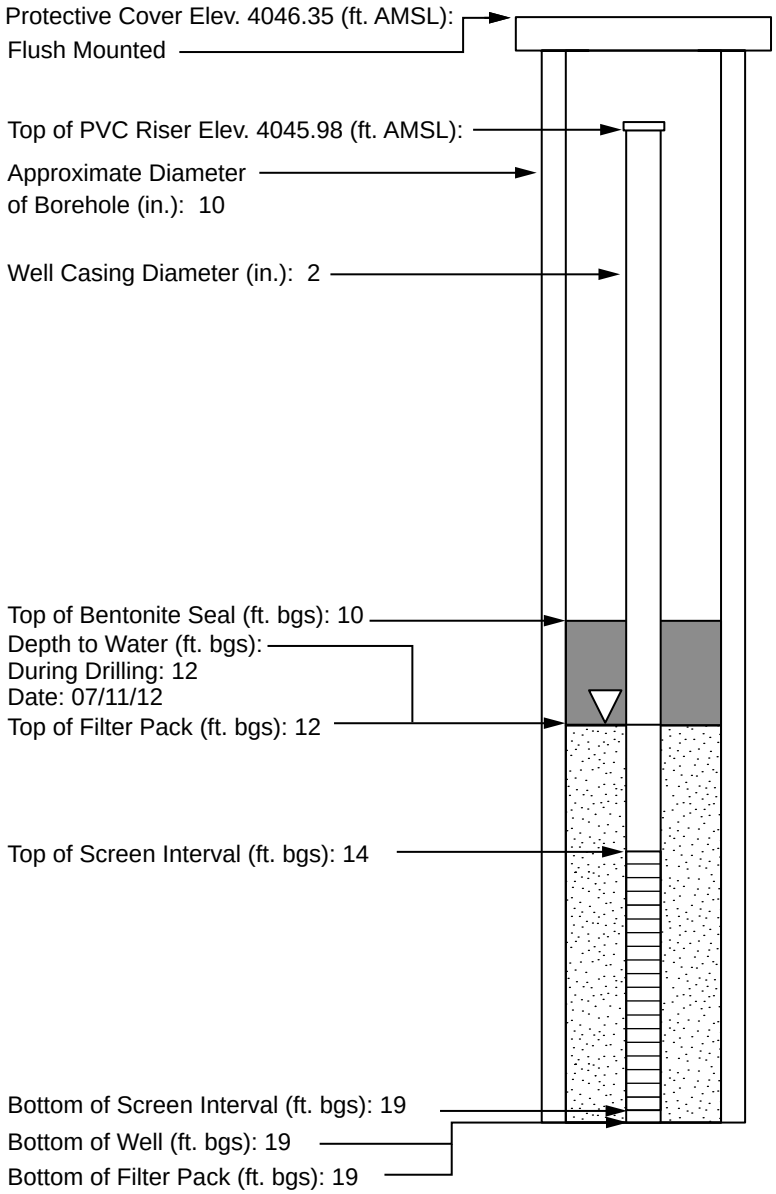
Well Screen Casing:
Manufacturer: DSI
Type: 2" Pre-pack w/ vf SS Mesh w/ 1A Sand
Slot Size (in.): 0.010
Slot Type: Factory

Sump/End Cap (in.): 4 (PVC)
Backfill Material: NA

Well Construction Diagram

Project: Holloman AFB
Location: OT-C531B
Client: USAF
Subcontractor: Major Drilling
Driller: K. Burkhead
Drilling Method/Rig Type: DPT/Auger
Shaw Field Representative: M. Hardner

Well Number: OTC531B-MW01
Site Location: Building 921
Installation Date: 07/11/2012
Completion Date: 07/11/2012
Grid Northing: 668828.3842
Grid Easting: 1678273.9538
NAD: 83 SPCS NM Central
NAVD: 88



Not To Scale

Protective Casing: Circular
Type: Flush Mount
Dimensions (in.): 8
Length (in): 10
Guard Post: NA

Ground Seal (Surface pad):
Dimensions (ft.): 2 x 2
Type: Concrete

Annular Space Seal:
Type: Quikcrete and Quikgel Bentonite
Installation: Gravity

Bentonite Seal:
Manufacturer: Enviro Plug
# of Bags: 2 (50 lbs each)
Type: 3/8" Pellets
Installation: Gravity
Hydration time (hrs): 1

Filter Pack Material:
Manufacturer: DSI
Product Name: Well Gravel Pack
Size: GP#3
# of bags: 3.5 (50 lbs each)
Installation: Gravity

Well Casing Used (ft.):
Manufacturer: Silverline
Type: PVC Schedule 40
Diameter (in.): 2

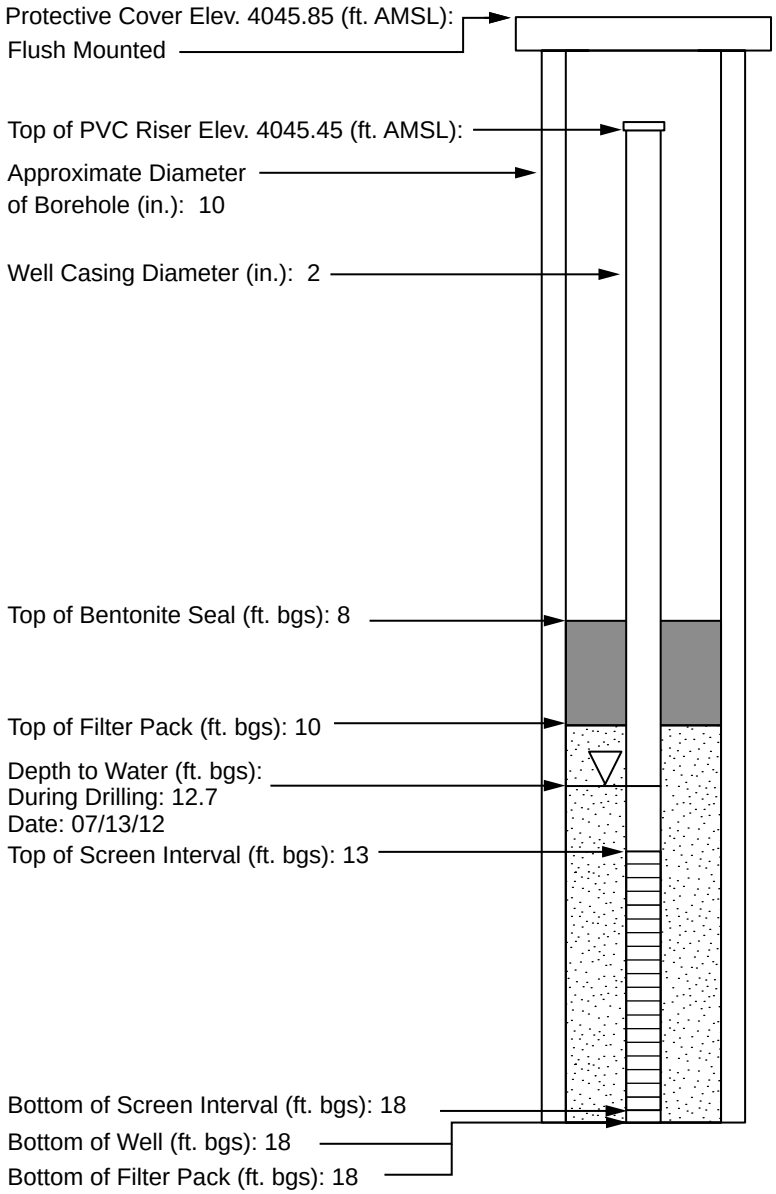
Well Screen Casing:
Manufacturer: DSI
Type: 2" Pre-pack w/ vf SS Mesh w/ 1A Sand
Slot Size (in.): 0.010
Slot Type: Factory

Sump/End Cap (in.): 4 (PVC)
Backfill Material: NA

Well Construction Diagram

Project: Holloman AFB
Location: OT-C531C
Client: USAF
Subcontractor: Major Drilling
Driller: K. Burkhead
Drilling Method/Rig Type: DPT/Auger
Shaw Field Representative: M. Hardner

Well Number: OTC531C-MW01
Site Location: Building 922
Installation Date: 07/13/2012
Completion Date: 07/13/2012
Grid Northing: 668288.4318
Grid Easting: 1678381.8235
NAD: 83 SPCS NM Central
NAVD: 88



Not To Scale

Protective Casing: Circular
Type: Flush Mount
Dimensions (in.): 8
Length (in): 10
Guard Post: NA

Ground Seal (Surface pad):
Dimensions (ft.): 2 x 2
Type: Concrete

Annular Space Seal:
Type: Quikcrete and Quikgel Bentonite
Installation: Gravity

Bentonite Seal:
Manufacturer: Enviro Plug
# of Bags: 1 1/3 (50 lbs each)
Type: 3/8" Pellets
Installation: Gravity
Hydration time (hrs): 1

Filter Pack Material:
Manufacturer: DSI
Product Name: Well Gravel Pack
Size: GP#3
# of bags: 3 (50 lbs each)
Installation: Gravity

Well Casing Used (ft.):
Manufacturer: Silverline
Type: PVC Schedule 40
Diameter (in.): 2

Well Screen Casing:
Manufacturer: DSI
Type: 2" Pre-pack w/ vf SS Mesh w/ 1A Sand
Slot Size (in.): 0.010
Slot Type: Factory

Sump/End Cap (in.): 4 (PVC)
Backfill Material: NA

Appendix G
Well Purge Records

Shaw® Shaw E & I

EXAMPLE
WELL PURGE RECORD

Project Name: Holloman AFB

Location: OT-C531A

Well/Piez. No.: OT-C531A-1

Personnel: CL, CH

Date Installed: 7/10/12

Date (Start/End): 7/17/12

Csg. Diameter (I.D.): 2"

~~Method of Development~~: Sampling

Total Depth (ft. TOC): 20.46'

☐ Surging ☐ Bailing ☐ Pumping ☐ Other (State Method) _____

☐ Original Development ☐ Redevelopment ~~Development~~ Sample Date: 7/17/12

Depth to water before developing well: 15.90 ft toc (pre-tubing)
15.89 ft toc (post-tubing)

Height of Water Column:		feet		Volume (V)	*	Purge Factor	=	Volume To Purge
			=		gal.*		=	[illegible] gal

$V = (B * r_c^2 * L_c * 7.48) + (B*(r_w - r_c)^2 * L_s * \phi_s * 7.48) =$ _____ gallons (See Notes below)

Depth purging from: 18 feet Time purging begins: 1400, 7/17/12

Weather: Sunny, 90's Screened Interval (ft. BGL): 13-18'

Equipment Nos.: ~~pH Meter~~ YSI 6820 EC Meter N/A Turbidity Meter N/A

Equipment decontaminated prior to development Y X N

Describe Alconox and DI H_2O

Date	Time	Water Level (ft. below TOC)	Volume Removed ~~(gal.)~~ L	Temp (C or F)	pH	Cond ~~EC~~ mS/cm	Turbidity NTU	D.O.	~~Comments~~ ORP	TDS (g/L)
0.2 L/min 7/17/12	1409	17.85	0.2	21.76	6.67	38.18	12.3	2.33	339.7	24.60
"	1414	18.49	1.2	22.42	6.86	37.10	27.7	1.62	354.3	24.11
0.1 L/min "	1419	18.78	~~2.2~~ 1.7	23.33	6.92	36.66	55.4	1.94	334.6	23.83
"	1424	19.50	2.2	23.65	6.91	38.28	200.0	2.62	348.9	24.84
"	1425		*Sample for TDS only*							

Notes:

- Water levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to 0.1 pH units
- Electrical conductivity (EC) – Reported to the nearest 10% mhos/cm or
- µmho/cm @25 C or in mS/cm of instrument set range
- Water temperature – Reported to the nearest 0.1 C or F
- Dissolved oxygen (D.O.) report in 0.1 mg/L
- Turbidity report in NTV nearest whole #

Where:

B=3.14

ϕ_s=porosity of the sand pack

r_c =radius of the well casing and screen in feet

L_c=length of water column inside the casing and screen in

r_w =radius of the well bore in feet

L_s =length of saturated portion of the sand pack in feet

7.48 gallons/cubic foot=conversion from cubic feet to gallons

well almost purged dry, which accounts for high turbidity readings.

Shaw® Shaw E & I

EXAMPLE
WELL PURGE RECORD

Project Name: HAFB

Location: STC531B (Bldg 921) Well/Piez. No.: _____

Personnel: Chase Hill Date Installed: _____

Date (Start/End): 08/14/12 Csg. Diameter (I.D.): ~~10~~ 2"

Method of Development: micropurge Total Depth (ft. TOC): _____

☐ Surging ☐ Bailing ☑ Pumping ☐ Other (State Method) _____

☐ Original Development ☐ Redevelopment Development Date: _____

Depth to water ~~before developing well~~: 12.84'

			Volume (V)		Purge Factor		Volume To Purge
Height of Water Column:	_____	feet	_____	=	_____ gal.*	_____	= _____

$V = (B * r_c^2 * L_c * 7.48)+(B*(r_w-r_c)^2*L_s*ø_s*7.48)=$ _____ gallons (See Notes below)

Depth purging from: 14' feet Time purging begins: _____

Weather: sunny 95°F Screened Interval (ft. BGL): _____

Equipment Nos.: pH Meter _____ EC Meter _____ Turbidity Meter _____

Equipment decontaminated prior to development Y _____ N _____

Describe YSI 6820 #36920

Date	Time	Water Level (ft. below TOC)	Volume Removed (gal.)	Temp (C or F)	pH	Cond. ~~EC~~	Turbidity	D.O. mg/L	~~Comments~~ ORP	TDS g/L
08/14/12	0833	12.90	0	20.72	6.89	25.28	0.3	1.03	-17.5	16.43
"	0838	12.89	0.5	20.55	6.90	25.42	-2.0	1.04	-22.7	16.52
"	0843	"	1.0	20.60	6.91	25.43	-4.2	0.55	-24.3	16.54
"	0848	"	1.5	20.57	6.92	25.47	-5.1	0.44	-24.9	16.55
"	0853	"	2.0	20.67	6.92	25.45	-5.8	0.51	-25.1	16.54
"	0858	"	2.5	20.64	6.93	25.46	-5.9	0.52	-24.9	16.54
"	0903	"	3.0	20.79	6.93	25.43	-6.0	0.51	-24.8	16.53
	0905	SAMPLED								

Notes:

- Water levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to 0.1 pH units
- Electrical conductivity (EC) – Reported to the nearest 10% mhos/cm or µmho/cm @25 C or in mS/cm of instrument set range
- Water temperature – Reported to the nearest 0.1 C or F
- Dissolved oxygen (D.O.) report in 0.1 mg/L
- Turbidity report in NTV nearest whole #

Where:

B=3.14

$ø_s$=porosity of the sand pack

r_c =radius of the well casing and screen in feet

L_c=length of water column inside the casing and screen in feet

r_w =radius of the well bore in feet

L_s =length of saturated portion of the sand pack in feet

7.48 gallons/cubic foot=conversion from cubic feet to gallons

Shaw® Shaw E & I

EXAMPLE
WELL PURGE RECORD

Project Name: HAFB

Location: OTC-53IC (Bldg 922) Well/Piez. No.: _____

Personnel: Chase Hill Date Installed: _____

Date (Start/End): 08/14/12 Csg. Diameter (I.D.): 2"

Method of ~~Development~~: micropurge Total Depth (ft. TOC): _____

☐ Surging ☐ Bailing ☑ Pumping ☐ Other (State Method) _____

☐ Original Development ☐ Redevelopment Development Date: _____

Depth to water before developing well: 12.97'

			Volume (V)		Purge Factor		Volume To Purge
Height of Water Column:	_____	feet	_____	=	_____ gal.*	_____	= _____

$V = (B * r_c^2 * L_c * 7.48)+(B*(r_w-r_c)^2*L_s*ø_s*7.48)=$ _____ gallons (See Notes below)

Depth purging from: 14' feet Time purging begins: _____

Weather: Sunny 95°F Screened Interval (ft. BGL): _____

Equipment Nos.: pH Meter _____ EC Meter _____ Turbidity Meter _____

Equipment decontaminated prior to development Y _____ N _____

Describe YSI 6820 #36920

Date	Time	Water Level (ft. below TOC)	Volume Removed (gal.)	Temp (C or F)	pH	~~Cond.~~ ~~EC~~	Turbidity	D.O. mg/L	~~Comments~~ ORP	TDS g/L
08/14/12	1040	14.10'	5.0	19.82	6.81	12.72	28.0	4.55	-177.5	8.272
"	1045	"	6.0	19.61	6.80	12.79	30.2	4.37	-175.6	8.312
"	1050	"	7.0	19.90	6.80	12.77	27.6	4.20	-167.0	8.299
	1052	SAMPLED								

Notes:

- Water levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to 0.1 pH units
- Electrical conductivity (EC) – Reported to the nearest 10% mhos/cm or µmho/cm @25 C or in mS/cm of instrument set range
- Water temperature – Reported to the nearest 0.1 C or F
- Dissolved oxygen (D.O.) report in 0.1 mg/L
- Turbidity report in NTV nearest whole #

Where:

B=3.14

$ø_s$=porosity of the sand pack

r_c =radius of the well casing and screen in feet

L_c=length of water column inside the casing and screen in feet

r_w =radius of the well bore in feet

L_s =length of saturated portion of the sand pack in feet

7.48 gallons/cubic foot=conversion from cubic feet to gallons

Shaw® Shaw E & I

EXAMPLE
WELL PURGE RECORD

Project Name: Holloman AFB / Midwest

Location: OTC531B

Well/Piez. No.: OTC531B-MW01

Personnel: C LaChana, T. Kunal

Date Installed: 7/11/12

Date (Start/End): 5/15/13

Csg. Diameter (I.D.): 2

Method of ~~Development~~: Sampling

Total Depth (ft. TOC): 19

☐ Surging ☐ Bailing ☒ Pumping ☒ Other (State Method) Sampling w/ bladder pump

☐ Original Development ☐ Redevelopment ~~Development~~ Sample Date: 5/15/13

Depth to water before ~~developing~~ purging well: 13.49 ft pre-pump

	Volume (V)	Purge Factor	Volume To Purge
Height of Water Column: _____ feet	_____ = _____ gal.*	_____	= _____

$V = (B * r_c^2 * L_c * 7.48) + (B*(r_w - r_c)^2 * L_s * \phi_s * 7.48) =$ _____ gallons (See Notes below)

Depth purging from: 18 feet

Time purging begins: 1520

Weather: Sunny, 90's

Screened Interval (ft. BGL): 14 - 19

Equipment Nos.: pH Meter YSI 650 EC Meter _____ Turbidity Meter _____

Equipment decontaminated prior to development Y X N _____

Describe DI H2O, Alconox

Date 5/15/13	Time	Water Level (ft. below TOC)	Volume Removed ~~(gal.)~~ L	Temp (C or F)	pH	EC	Turbidity	D.O.	~~Comments~~ ORP
"	1520	13.54	0	23.21	6.90	24.07	87.4	2.67	46.1
"	1525	13.55	2.5	20.16	6.88	24.00	59.1	2.31	45.3
"	1530	13.67	5	19.70	6.88	23.94	26.0	1.92	46.6
"	1535	13.68	7.5	19.26	6.89	23.86	7.9	2.10	45.5
"	1540	13.65	10	19.38	6.90	23.83	5.6	2.23	45.5
"	1545	Sample Time							

Notes:

- Water levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to 0.1 pH units
- Electrical conductivity (EC) – Reported to the nearest 10% mhos/cm or
- µmho/cm @25 C or in mS/cm of instrument set range
- Water temperature – Reported to the nearest 0.1 C or F
- feet
- Dissolved oxygen (D.O.) report in 0.1 mg/L
- Turbidity report in NTV nearest whole #

Where:

B=3.14

ϕ_s=porosity of the sand pack

r_c =radius of the well casing and screen in feet

L_c=length of water column inside the casing and screen in

r_w =radius of the well bore in feet

L_s =length of saturated portion of the sand pack in feet

7.48 gallons/cubic foot=conversion from cubic feet to gallons

Shaw® Shaw E & I

EXAMPLE
WELL PURGE RECORD

Project Name: Midwest / Holloman AFB

Location: OTC531A (Building 920)
Well/Piez. No.: OTC531A-MW01

Personnel: C. LaChance, T. Kunkel
Date Installed: 7/10/12

Date (Start/End): 5/16/13
Csg. Diameter (I.D.): 2"

Method of ~~Development~~: Sampling
Total Depth (ft. TOC): 20.46

☐ Surging ☐ Bailing ☒ Pumping ☐ Other (State Method) _____

☐ Original Development ☐ Redevelopment ~~Development~~ Date: 5/16/13

Depth to water before developing well: CL 13.94 ft pre-tubing / 15.31 ft btoc Sample 13.51 ft post tubing / 14.15 ft btoc

Volume (V) | Purge Factor | Volume To Purge

Height of Water Column: _____ feet _____ = _____ gal.* _____ = _____

$V = (B * r_c^2 * L_c * 7.48)+(B*(r_w-r_c)^2*L_s*ø_s*7.48)=$ _____ gallons (See Notes below)

Depth purging from: _____ feet
Time purging begins: _____

Weather: Sunny, 80's am
Screened Interval (ft. BGL): 13-18

Equipment Nos.: pH Meter YSI 850 MDS EC Meter _____ Turbidity Meter _____

Equipment decontaminated prior to development Y _____ N _____

Describe Alconox, DI H_2O

Date 5/16/13	Time	Water Level (ft. below TOC)	Volume Removed ~~(gal.)~~ L	Temp (C or F)	pH	EC mS/cm	Turbidity NTU	D.O. mg/L	~~Comments~~ ORP
CL ~~~~	~~0757~~	~~13.51~~	~~0~~	~~20.87~~	~~6.73~~	~~19.37~~	~~0~~		
11	0839	~~15.~~ NR*	0	23.84	7.34	38.67	35.2	5.96	388
11	0844	NR*	2.5	21.01	7.30	38.49	34.1	5.65	25.7
	No Sample Collected. Well purged dry and did not recharge.								

Notes:

- Water levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to 0.1 pH units
- Electrical conductivity (EC) – Reported to the nearest 10% mhos/cm or
- µmho/cm @25 C or in mS/cm of instrument set range
- Water temperature – Reported to the nearest 0.1 C or F feet
- Dissolved oxygen (D.O.) report in 0.1 mg/L
- Turbidity report in NTV nearest whole #

Where:
B=3.14
$ø_s$=porosity of the sand pack
r_c =radius of the well casing and screen in feet
L_c=length of water column inside the casing and screen in
r_w =radius of the well bore in feet
L_s =length of saturated portion of the sand pack in feet
7.48 gallons/cubic foot=conversion from cubic feet to gallons

pump isn't bringing up water. Remove pump. Remeasure H_2O level at 15.31 ft btoc. Fix connection and replace bladder. 14.15 ft btoc post-tubing.

* well purged dry. Will let well recharge and then sample immediately.

Appendix H
Site Survey Data

Revised Rpt
09/11/2013
(re: TU/US-C513)
p. 7 of 10

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	682987.8550	1687022.9920	4098.16	BASE	682789.9107	1686534.0572
2	678390.1010	1678735.5020	4064.77	CP-52-P-19	678193.4892	1678248.9690
3	683252.1480	1680789.5360	4078.80	CP-55-JACK	683054.1271	1680302.4077
4	681667.1260	1694574.3780	4140.57	CP-56-AIR	681469.5645	1694083.2546
5	669733.4460	1682234.2110	4048.59	HAFB-07-07	669539.3431	1681746.6640
6	669695.2030	1718768.4150	4157.95	ALAMOAIR	669501.1112	1718270.2797
7	674362.7100	1713591.4300	4160.17	F248	674167.2655	1713094.7951
8	676850.6600	1718114.2590	4193.99	E-248	676654.4944	1717616.3133
50	691964.7620	1687201.2770	4140.90	MALONE	691764.2160	1686712.2905
51	662077.1700	1670356.4250	4077.10	BATE	661885.2861	1669872.3205
52	678390.1080	1678735.5040	4066.10	P 19	678193.4962	1678248.9710
53	644127.0780	1700529.8000	4039.00	MONT	643940.3964	1700036.9506
54	676850.6920	1718114.2670	4193.99	E 248	676654.5264	1717616.3213
55	683252.1970	1680789.5390	4080.20	JACK	683054.1761	1680302.4107
56	681667.0380	1694574.3640	4141.20	AIR	681469.4765	1694083.2406
82	678193.4999	1678248.9801	4064.92	P	677996.9451	1677762.5882
84	676654.5300	1717616.3305	4192.77	E	676458.4212	1717118.5291
85	683054.1798	1680302.4198	4079.02	JACK	682856.2163	1679815.4327
86	681469.4802	1694083.2497	4140.00	AIR	681271.9760	1693592.2686
100	685975.0760	1686614.9100	4101.87	OT-C534-PVC	685776.2660	1686126.0934
101	685975.4260	1686614.8310	4102.28	OT-C534-CASING	685776.6159	1686126.0145
102	685952.4860	1686626.9650	4101.89	OT-C534-W2-PVC	685753.6825	1686138.1449
103	685952.6870	1686626.9300	4102.33	OT-C534-W2-CASING	685753.8834	1686138.1099
104	685939.9110	1686581.7340	4101.89	OT-C534-W1-CASING	685741.1111	1686092.9270
105	685939.6450	1686581.7790	4101.57	OT-C534-W1-PVC	685740.8452	1686092.9720
106	685924.3640	1686619.9800	4101.81	OT-C534-W4-PVC	685725.5687	1686131.1620
107	685924.6590	1686619.8790	4102.23	OT-C534-W4-CASING	685725.8636	1686131.0610
108	685934.1180	1686578.3320	4101.72	OT-C534-LEACH-NG	685735.3198	1686089.5260
109	685935.7830	1686600.7340	4101.88	OT-C534-LEACH-NG	685736.9843	1686111.9215
110	685938.2680	1686607.0980	4101.88	OT-C534-LEACH-NG	685739.4686	1686118.2837
111	685951.4240	1686604.4600	4101.90	OT-C534-LEACH-NG	685752.6208	1686115.6465
112	685953.8200	1686601.1380	4101.88	OT-C534-LEACH-NG	685755.0161	1686112.3254
113	685953.2500	1686596.8650	4101.88	OT-C534-LEACH-NG	685754.4463	1686108.0537
114	685946.2830	1686578.3790	4101.81	OT-C534-LEACH-NG	685747.4813	1686089.5730
115	685945.3070	1686576.3400	4101.88	OT-C534-LEACH-NG	685746.5056	1686087.5346
116	685940.6850	1686575.6580	4101.79	OT-C534-LEACH-NG	685741.8849	1686086.8528
117	685952.3510	1686614.8200	4102.03	OT-C534-LEACH-NG	685753.5475	1686126.0035
118	685953.0040	1686623.0300	4102.13	OT-C534-LEACH-NG	685754.2004	1686134.2111
119	685945.6920	1686623.1960	4102.03	OT-C534-LEACH-NG	685746.8905	1686134.3770
120	685944.8810	1686615.5440	4101.97	OT-C534-LEACH-NG	685746.0797	1686126.7272
121	685948.0570	1686615.1700	4101.97	OT-C534-FLINE-NG	685749.2548	1686126.3534
122	685947.7680	1686606.3420	4101.81	OT-C534-FLINE-NG	685748.9659	1686117.5279
123	685953.2050	1686618.0690	4102.08	OT-C534-ENFLU-NG	685754.4013	1686129.2515
124	685968.5800	1686611.5870	4102.06	OT-C534-ENFLU-NG	685769.7718	1686122.7714
125	686021.5760	1686604.3860	4102.49	OT-C534-ENFLU-NG	685822.7525	1686115.5725
126	686051.0660	1686600.5520	4102.82	OT-C534-ENFLU-NG	685852.2339	1686111.7396
127	682943.9250	1686529.5770	4094.74	OT-C536-STATION1-NG	682745.9934	1686040.7852
128	682925.1900	1686534.9010	4094.63	OT-C536-STATION2-NG	682727.2639	1686046.1076
129	682914.0740	1686530.8350	4094.17	OT-C536-STATION3-NG	682716.1511	1686042.0428
130	682900.2750	1686534.1950	4094.40	MW-OT-C5361-CASING	682702.3561	1686045.4018
131	682900.0410	1686534.2560	4094.03	MW-OT-C5361-PVC	682702.1222	1686045.4628
132	682892.0960	1686514.3610	4094.08	OT-C536-LEACH-NG	682694.1795	1686025.5736
133	682905.9860	1686504.4840	4093.98	OT-C536-LEACH-NG	682708.0654	1686015.6994
134	682914.9460	1686505.2970	4094.10	OT-C536-LEACH-NG	682717.0228	1686016.5122
135	682919.4610	1686521.1490	4094.40	OT-C536-LEACH-NG	682721.5365	1686032.3596
136	682921.1340	1686534.7310	4094.42	OT-C536-LEACH-NG	682723.2091	1686045.9377
137	682919.5910	1686545.0230	4094.72	OT-C536-LEACH-NG	682721.6665	1686056.2267
138	682912.1700	1686551.2270	4094.60	OT-C536-LEACH-NG	682714.2477	1686062.4289
139	682897.7180	1686551.9240	4094.16	OT-C536-LEACH-NG	682699.7998	1686063.1257
140	682892.5110	1686549.8820	4094.18	OT-C536-LEACH-NG	682694.5943	1686061.0843
141	682922.3680	1686533.4440	4094.42	OT-C536-TANKPIT-NG	682724.4427	1686044.6510
142	682920.9800	1686525.5880	4094.39	OT-C536-TANKPIT-NG	682723.0551	1686036.7973
143	682928.0220	1686524.4280	4094.63	OT-C536-TANKPIT-NG	682730.0951	1686035.6377
144	682929.2370	1686532.7090	4094.62	OT-C536-TANKPIT-NG	682731.3097	1686043.9163
145	682949.7020	1686528.9800	4094.75	OT-C536-ENFLU-NG	682751.7688	1686040.1883
146	682921.2900	1686528.9090	4094.41	OT-C536-ENFLU-NG	682723.3650	1686040.1174
147	682916.2970	1686530.1310	4094.27	OT-C536-ENFLU-NG	682718.3735	1686041.3390
148	682877.6850	1686739.3620	4095.03	OT-C533-MW-CASING	682679.7726	1686250.5094
149	682877.4490	1686739.4350	4094.68	OT-C533-MW-PVC	682679.5367	1686250.5823
150	682884.2550	1686735.8390	4094.76	OT-C533-LEACH-NG	682686.3407	1686246.9874
151	682877.4700	1686734.1690	4094.84	OT-C533-LEACH-NG	682679.5577	1686245.3179

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
152	682871.6400	1686736.6530	4094.83	OT-C533-LEACH-NG	682673.7294	1686247.8011
153	682869.4200	1686738.9370	4094.89	OT-C533-LEACH-NG	682671.5100	1686250.0845
154	682868.8760	1686741.4810	4094.99	OT-C533-LEACH-NG	682670.9662	1686252.6277
155	682867.8710	1686756.1100	4095.03	OT-C533-LEACH-NG	682669.9615	1686267.2525
156	682857.6950	1686766.0680	4095.35	OT-C533-LEACH-NG	682659.7884	1686277.2076
157	682855.8760	1686772.9280	4095.39	OT-C533-LEACH-NG	682657.9700	1686284.0656
158	682855.6590	1686783.4130	4095.46	OT-C533-LEACH-NG	682657.7530	1686294.5476
159	682855.5230	1686790.0690	4095.47	OT-C533-LEACH-NG	682657.6171	1686301.2017
160	682857.2270	1686794.8730	4095.42	OT-C533-LEACH-NG	682659.3206	1686306.0043
161	682858.6900	1686813.7880	4095.55	OT-C533-LEACH-NG	682660.7832	1686324.9138
162	682867.9360	1686816.7350	4095.32	OT-C533-LEACH-NG	682670.0265	1686327.8599
163	682880.0660	1686814.6740	4095.00	OT-C533-LEACH-NG	682682.1530	1686325.7995
164	682891.9700	1686818.7840	4094.82	OT-C533-LEACH-NG	682694.0535	1686329.9083
165	682901.1340	1686806.7570	4094.86	OT-C533-LEACH-NG	682703.2148	1686317.8848
166	682889.7110	1686785.0140	4094.98	OT-C533-LEACH-NG	682691.7952	1686296.1481
167	682889.3190	1686757.8750	4094.96	OT-C533-LEACH-NG	682691.4033	1686269.0170
168	682886.6550	1686745.7080	4094.83	OT-C533-LEACH-NG	682688.7400	1686256.8535
169	682895.8900	1686814.7130	4095.19	OT-C533-FFLUEN-NG	682697.9724	1686325.8385
170	682901.8890	1686814.2530	4095.86	OT-C533-FFLUEN-TPAD	682703.9696	1686325.3787
171	682901.5970	1686811.8220	4095.84	OT-C533-SEPTIC-TCONC	682703.6777	1686322.9484
172	682911.5820	1686810.3750	4095.77	OT-C533-SEPTIC-TCONC	682713.6598	1686321.5018
173	682912.4280	1686815.4170	4095.77	OT-C533-SEPTIC-TCONC	682714.5056	1686326.5423
174	682902.3730	1686816.8390	4095.84	OT-C533-SEPTIC-TCONC	682704.4535	1686327.9639
175	682912.0910	1686812.7560	4095.77	OT-C533-EFLUEN-TCONC	682714.1687	1686323.8821
176	682923.3600	1686810.9450	4095.29	OT-C533-EFLUEN-NG	682725.4344	1686322.0716
177	682942.2940	1686810.3140	4095.49	OT-C533-EFLUEN-NG	682744.3629	1686321.4408
178	682937.5080	1686805.9000	4095.30	OT-C533-STATION1-NG	682739.5783	1686318.0278
179	682906.2780	1686808.8380	4094.86	OT-C533-STATION2-NG	682708.3574	1686319.9652
180	682895.2770	1686813.2080	4094.98	OT-C533-STATION3-NG	682697.3595	1686324.3340
181	700191.9570	1695605.3730	4181.72	OT-C540-STATION1-ASP	699989.0266	1695113.9508
182	700173.9260	1695611.2520	4181.82	OT-C540-STATION2-NG	699971.0008	1695119.8281
183	700168.8930	1695604.5390	4181.39	OT-C540-STATION3-NG	699965.9693	1695113.1170
184	700151.2700	1695598.6630	4180.49	OT-C540-STATION4-NG	699948.3514	1695107.2427
185	700158.9630	1695593.9090	4180.86	OT-C540-LEACH-NG	699956.0422	1695102.4901
186	700150.2560	1695603.0840	4180.78	OT-C540-LEACH-NG	699947.3377	1695111.6625
187	700152.8330	1695609.6400	4180.81	OT-C540-LEACH-NG	699949.9139	1695118.2166
188	700155.1660	1695611.7200	4180.89	OT-C540-LEACH-NG	699952.2463	1695120.2960
189	700161.1020	1695611.3470	4181.11	OT-C540-LEACH-NG	699958.1805	1695119.9231
190	700163.7200	1695601.1600	4181.06	OT-C540-LEACH-NG	699960.7978	1695109.7390
191	700161.5790	1695596.1920	4181.05	OT-C540-LEACH-NG	699958.6574	1695104.7725
192	700165.7400	1695603.7570	4181.48	OT-C540-FFLUEN-NG	699962.8172	1695112.3353
193	700170.8520	1695608.8530	4181.93	OT-C540-FFLUEN-NG	699967.9277	1695117.4298
194	700170.7290	1695606.7600	4182.01	OT-C540-SEPTIC-NG	699967.8048	1695115.3374
195	700176.8760	1695605.4490	4181.91	OT-C540-SEPTIC-NG	699973.9500	1695114.0268
196	700177.5910	1695612.4300	4181.92	OT-C540-SEPTIC-NG	699974.6648	1695121.0058
197	700172.1930	1695613.9030	4182.05	OT-C540-SEPTIC-NG	699969.2683	1695122.4783
198	700177.7030	1695608.9790	4181.69	OT-C540-EFLUEN-NG	699974.7767	1695117.5558
199	700205.8220	1695608.1850	4181.85	OT-C540-EFLUEN-ASPH	700002.8876	1695116.7620
200	700246.4300	1695613.4690	4182.95	OT-C540-EFLUEN-ASPH	700043.4838	1695122.0445
201	700238.4930	1695614.0360	4182.51	OT-C540-BLDGCOR	700035.5491	1695122.6113
202	700228.4390	1695608.1640	4182.55	OT-C540-BLDGCOR	700025.4980	1695116.7410
203	700227.0510	1695568.0300	4182.87	OT-C540-BLDGCOR	700024.1104	1695076.6186
204	700236.9380	1695557.6950	4183.02	OT-C540-BLDGCOR	700033.9946	1695066.2866
205	688305.7410	1690609.5510	4126.46	TU\US-C507-STATION1-	688106.2555	1690119.5767
206	688309.7220	1690614.0760	4126.51	TU\US-C507-STATION2-	688110.2353	1690124.1004
207	688306.7130	1690619.4150	4126.45	TU\US-C507-STATION3-	688107.2272	1690129.4378
208	688313.7000	1690621.8280	4126.37	TU\US-C507-STATION4-	688114.2122	1690131.8501
209	688313.7950	1690607.6410	4126.36	TU\US-C507-STATION5-	688114.3071	1690117.6673
210	688304.0140	1690620.9730	4126.47	TU\US-C507-USTPIT-AS	688104.5290	1690130.9954
211	688304.3040	1690607.3010	4126.54	TU\US-C507-USTPIT-AS	688104.8189	1690117.3274
212	688317.4320	1690607.1780	4126.54	TU\US-C507-USTPIT-AS	688117.9431	1690117.2044
213	688317.6000	1690622.2860	4126.57	TU\US-C507-USTPIT-AS	688118.1110	1690132.3080
214	688320.7590	1690623.9670	4127.18	TU\US-C507-BLDGCOR	688121.2691	1690133.9885
215	688330.7630	1690627.7570	4125.65	TU\US-C507-BLDGCOR	688131.2702	1690137.7774
216	688318.5520	1690598.7120	4126.71	TU\US-C507-BLDGCOR	688119.0628	1690108.7408
217	688306.5580	1690598.9520	4126.69	TU\US-C507-BLDGCOR	688107.0722	1690108.9808
218	688287.5740	1690592.3200	4126.83	TU\US-C507-EXMW1	688088.0937	1690102.3507
219	688287.4600	1690625.9270	4126.36	TU\US-C507-EXMW2	688087.9798	1690135.9480
220	689216.8690	1680453.8850	4087.76	TU\US-C501-STATION4-	689017.1194	1679966.8540
221	689203.4000	1680450.4300	4087.80	TU\US-C501-STATION1-	689003.6543	1679963.4000
222	689227.9170	1680449.2880	4087.78	TU\US-C501-STATION2-	689028.1642	1679962.2584

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
223	689201.2820	1680437.6020	4087.96	TU\US-C501-STATION3-	689001.5369	1679950.5757
224	689204.0090	1680426.7550	4087.80	TU\US-C501-STATION5-	689004.2631	1679939.7319
225	689200.5240	1680440.6650	4087.95	TU\US-C501-BLDGCOR-N	689000.7792	1679953.6379
226	689191.1430	1680432.8740	4088.07	TU\US-C501-BLDGCOR-N	688991.4009	1679945.8491
227	689202.0960	1680449.8730	4087.79	TU\US-C501-TANKPIT-N	689002.3507	1679962.8432
228	689201.5860	1680440.8210	4087.99	TU\US-C501-TANKPIT-N	689001.8408	1679953.7938
229	689191.7450	1680432.9310	4088.07	TU\US-C501-TANKPIT-N	688992.0027	1679945.9061
230	689195.4710	1680423.1750	4087.88	TU\US-C501-TANKPIT-N	688995.7276	1679936.1529
231	689207.1960	1680422.4490	4087.92	TU\US-C501-TANKPIT-N	689007.4492	1679935.4271
232	689229.2900	1680431.3210	4087.77	TU\US-C501-TANKPIT-N	689029.5368	1679944.2966
233	689231.6150	1680444.1310	4087.67	TU\US-C501-TANKPIT-N	689031.8611	1679957.1029
234	689227.5450	1680454.7320	4087.83	TU\US-C501-TANKPIT-N	689027.7923	1679967.7008
235	689218.0540	1680463.3780	4088.03	TU\US-C501-TANKPIT-N	689018.3041	1679976.3443
236	689209.0460	1680458.6260	4087.92	TU\US-C501-TANKPIT-N	689009.2987	1679971.5937
237	689237.1630	1680445.1670	4087.64	TU\US-C501-COMMLINE-	689037.4075	1679958.1386
238	689219.6050	1680436.9770	4088.00	TU\US-C501-COMMLINE-	689019.8546	1679949.9509
239	689199.7540	1680431.6770	4088.06	TU\US-C501-COMMLINE-	689000.0094	1679944.6525
240	689181.3550	1680425.0490	4088.20	TU\US-C501-COMMLINE-	688981.6157	1679938.0264
241	689162.6180	1680417.3900	4088.35	TU\US-C501-COMMLINE-	688962.8841	1679930.3696
242	689161.5970	1680417.5650	4088.56	TU\US-C501-COMMVAULT	688961.8634	1679930.5446
243	689157.8580	1680421.3400	4088.11	TU\US-C501-COMMVAULT	688958.1255	1679934.3185
244	689150.8680	1680414.5760	4088.10	TU\US-C501-COMMVAULT	688951.1375	1679927.5564
245	689154.6050	1680410.8830	4088.46	TU\US-C501-COMMVAULT	688954.8735	1679923.8645
246	687246.6430	1686873.0010	4105.82	OT-C535-STATION1-NG	687047.4644	1686384.1096
247	687270.5400	1686861.6690	4105.63	OT-C535-STATION2-NG	687071.3545	1686372.7809
248	687282.8340	1686866.7860	4105.85	OT-C535-STATION3-NG	687083.6449	1686377.8964
249	687303.5940	1686788.5490	4105.12	OT-C535-STATION4-NG	687104.3989	1686299.6821
250	687291.9640	1686793.7970	4105.27	OT-C535-LEACH-NG	687092.7723	1686304.9286
251	687304.7930	1686782.8770	4105.17	OT-C535-LEACH-NG	687105.5976	1686294.0117
252	687323.6740	1686798.1880	4105.34	OT-C535-LEACH-NG	687124.4731	1686309.3183
253	687319.7080	1686817.5380	4105.82	OT-C535-LEACH-NG	687120.5083	1686328.6627
254	687307.4400	1686838.9610	4105.76	OT-C535-LEACH-NG	687108.2438	1686350.0795
255	687297.0830	1686856.5380	4106.04	OT-C535-LEACH-NG	687097.8898	1686367.6514
256	687290.0540	1686837.9200	4105.59	OT-C535-LEACH-NG	687090.8628	1686349.0388
257	687291.3760	1686806.0200	4105.33	OT-C535-LEACH-NG	687092.1845	1686317.1480
258	687284.5890	1686864.5150	4106.11	OT-C535-FFLUEN-NG	687085.3994	1686375.6261
259	687276.8290	1686868.4490	4106.19	OT-C535-FFLUEN-NG	687077.6417	1686379.5589
260	687276.0820	1686870.8490	4106.28	OT-C535-SEPTIC-NG	687076.8949	1686381.9583
261	687263.3720	1686869.7190	4105.87	OT-C535-SEPTIC-NG	687064.1886	1686380.8286
262	687263.7200	1686863.5770	4105.95	OT-C535-SEPTIC-NG	687064.5365	1686374.6884
263	687276.4840	1686862.8870	4106.07	OT-C535-SEPTIC-NG	687077.2968	1686373.9986
264	687263.5270	1686868.1150	4105.92	OT-C535-EFLUEN-NG	687064.3435	1686379.2250
265	687228.9570	1686874.1570	4105.71	OT-C535-EFLUEN-NG	687029.7836	1686385.2653
266	687235.2230	1686881.4610	4106.05	OT-C535-BLDGCOR-NG	687036.0477	1686392.5672
267	687225.9150	1686892.3360	4105.90	OT-C535-BLDGCOR-NG	687026.7424	1686403.4390
268	687232.0250	1686844.5370	4105.92	OT-C535-BLDGCOR-NG	687032.8507	1686355.6539
269	687221.4890	1686835.3400	4105.63	OT-C535-BLDGCOR-NG	687022.3177	1686346.4595
270	677637.2460	1692755.6660	4110.24	TU/US-C505-MW1-CASIN	677440.8524	1692265.0697
271	677636.9990	1692755.6590	4109.84	TU/US-C505-MW1-PVC	677440.6055	1692265.0627
272	677634.4160	1692722.3930	4110.42	TU/US-C505-WELLATEMP	677438.0233	1692231.8064
273	677659.4620	1692742.2400	4110.34	TU/US-C505-WELLATEMP	677463.0620	1692251.6476
274	677701.9500	1692799.3200	4110.17	TU/US-C505-USTPIT-NG	677505.5377	1692308.7111
275	677701.3830	1692789.3010	4110.35	TU/US-C505-USTPIT-NG	677504.9708	1692298.6950
276	677711.5570	1692789.5280	4110.64	TU/US-C505-USTPIT-NG	677515.1419	1692298.9219
277	677710.8940	1692799.1130	4110.24	TU/US-C505-USTPIT-NG	677514.4791	1692308.5041
278	677707.4060	1692790.0820	4110.35	TU/US-C505-STATION1-	677510.9921	1692299.4757
279	677702.3100	1692795.0710	4110.20	TU/US-C505-STATION2-	677505.8976	1692304.4633
280	677705.6610	1692797.9500	4110.13	TU/US-C505-STATION3-	677509.2476	1692307.3415
281	677710.4770	1692793.8740	4110.09	TU/US-C505-STATION4-	677514.0622	1692303.2666
282	677706.4200	1692793.8350	4110.12	TU/US-C505-STATION5-	677510.0064	1692303.2276
283	677694.5060	1692779.7220	4110.88	TU/US-C505-BLDGCOR-N	677498.0958	1692289.1187
284	677704.1940	1692790.4680	4110.28	TU/US-C505-BLDGCOR-N	677507.7810	1692299.8616
285	677754.5670	1692783.0890	4110.79	TU/US-C505-BLDGCOR-N	677558.1394	1692292.4848
286	677743.8570	1692795.1680	4110.70	TU/US-C505-BLDGCOR-N	677547.4325	1692304.5603
287	686300.2320	1672933.0350	4060.98	OT-C542-MW-CASING-	686101.3277	1672448.1837
288	686300.2350	1672933.0550	4060.98	OT-C542-MW-PVC	686101.3307	1672448.2037
289	686274.4020	1672914.6520	4061.01	OT-C542-LEACH-NG	686075.5052	1672429.8061
290	686289.6710	1672938.5250	4060.76	OT-C542-LEACH-NG	686090.7698	1672453.6721
291	686294.6900	1672941.1720	4060.83	OT-C542-LEACH-NG	686095.7873	1672456.3184
292	686301.6970	1672938.9490	4060.85	OT-C542-LEACH-NG	686102.7923	1672454.0960
293	686305.7170	1672936.2850	4060.87	OT-C542-LEACH-NG	686106.8111	1672451.4328

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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
294	686308.0670	1672931.0550	4060.89	OT-C542-LEACH-NG	686109.1604	1672446.2043
295	686304.8000	1672917.9090	4060.82	OT-C542-LEACH-NG	686105.8944	1672433.0621
296	686292.3740	1672901.2590	4060.90	OT-C542-LEACH-NG	686093.4720	1672416.4169
297	686283.4190	1672906.7050	4060.97	OT-C542-FFLUEN-NG	686084.5196	1672421.8614
298	686280.3770	1672902.6520	4060.94	OT-C542-FFLUEN-NG	686081.4785	1672417.8095
299	686276.9070	1672904.6420	4060.95	OT-C542-SEPTIC-NG	686078.0095	1672419.7990
300	686271.2980	1672896.9550	4060.80	OT-C542-SEPTIC-NG	686072.4021	1672412.1142
301	686281.9530	1672889.9350	4060.83	OT-C542-SEPTIC-NG	686083.0540	1672405.0962
302	686287.0950	1672896.6800	4060.88	OT-C542-SEPTIC-NG	686088.1945	1672411.8393
303	686285.7900	1672894.7150	4060.83	OT-C542-EFLUEN-NG	686086.8899	1672409.8748
304	686299.2270	1672887.1560	4060.87	OT-C542-EFLUEN-NG	686100.3230	1672402.3180
305	686310.9860	1672881.5880	4061.18	OT-C542-EFLUEN-NG	686112.0786	1672396.7516
306	686294.2970	1672858.0380	4060.90	OT-C542-BLDGCOR-NG	686095.3944	1672373.2085
307	686295.8820	1672844.1310	4061.28	OT-C542-BLDGCOR-NG	686096.9790	1672359.3055
308	686345.1390	1672922.4560	4060.89	OT-C542-BLDGCOR-NG	686146.2217	1672437.6078
309	686358.9780	1672924.0940	4061.42	OT-C542-BLDGCOR-NG	686160.0567	1672439.2453
310	686291.8860	1672885.1500	4060.65	OT-C542-STATION1-NG	686092.9841	1672400.3126
311	686275.2730	1672891.5340	4060.63	OT-C542-STATION2-NG	686076.3760	1672406.6948
312	686281.5390	1672904.6340	4060.73	OT-C542-STATION2-NG	686082.6401	1672419.7910
313	685750.1690	1671530.2910	4055.60	OT-C543-STATION2-NG	685551.4241	1671045.8463
314	685734.0730	1671548.8090	4055.84	OT-C543-STATION2	685535.3328	1671064.3589
315	685727.7350	1671514.3350	4055.33	OT-C543-STATION3	685528.9966	1671029.8949
316	685749.4390	1671546.6740	4055.91	OT-C543-EXSEPTIC	685550.6944	1671062.2245
317	685732.6430	1671545.5190	4055.74	OT-C543-EXSEPTIC	685533.9032	1671061.0699
318	685741.2600	1671557.0720	4056.32	OT-C543-EXSEPTIC	685542.5177	1671072.6195
319	685738.1510	1671537.7290	4055.62	OT-C543-EXSEPTIC	685539.4096	1671053.2821
320	685734.3520	1671541.2760	4055.65	OT-C543-FFLUEN	685535.6117	1671056.8281
321	685716.0920	1671515.5090	4055.04	OT-C543-FFLUEN	685517.3570	1671031.0686
322	685708.2650	1671520.5800	4055.23	OT-C543-LEACH	685509.5323	1671036.1381
323	685688.3040	1671512.0560	4055.52	OT-C543-LEACH	685489.5771	1671027.6166
324	685669.5610	1671502.3840	4055.36	OT-C543-LEACH	685470.8395	1671017.9474
325	685659.9210	1671495.2130	4055.04	OT-C543-LEACH	685461.2023	1671010.7784
326	685670.4020	1671495.5660	4055.43	OT-C543-MW-CASING	685471.6803	1671011.1313
327	685670.1370	1671495.6580	4055.13	OT-C543-MW-PVC	685471.4153	1671011.2233
328	685682.2550	1671485.7460	4055.16	OT-C543-LEACH	685483.5298	1671001.3142
329	685699.8070	1671491.2750	4054.76	OT-C543-LEACH	685501.0767	1671006.8416
330	685710.4840	1671499.0550	4055.06	OT-C543-LEACH	685511.7506	1671014.6193
331	685721.5030	1671508.4730	4055.40	OT-C543-LEACH	685522.7664	1671024.0346
332	685794.8190	1671498.3320	4056.84	OT-C543-EFLUEN	685596.0612	1671013.8965
333	685809.3600	1671495.0820	4059.27	OT-C543-BLDGCOR	685610.5980	1671010.6475
334	685776.9050	1671465.9090	4060.02	OT-C543-BLDGCOR	685578.1524	1670981.4829
335	685785.4230	1671455.8900	4060.26	OT-C543-BLDGCOR	685586.6679	1670971.4668
336	685744.8400	1671542.1950	4055.76	OT-C543-EFLUEN	685546.0967	1671057.7468
337	685303.6520	1671072.3550	4048.79	OT-C544-MW-CASING	685105.0365	1670588.0430
338	685303.3550	1671072.2840	4048.52	OT-C544-MW-PVC	685104.7396	1670587.9720
339	685349.4970	1671083.9730	4052.43	OT-C544-STATION1	685150.8683	1670599.6576
340	685342.4960	1671086.5980	4051.55	OT-C544-STATION1	685143.8693	1670602.2819
341	685336.0530	1671085.0120	4050.99	OT-C544-STATION1	685137.4282	1670600.6963
342	685336.7000	1671089.5480	4051.15	OT-C544-SEPTIC	685138.0750	1670605.2310
343	685338.4520	1671075.7050	4051.30	OT-C544-SEPTIC	685139.8265	1670591.3920
344	685347.8050	1671077.3720	4052.23	OT-C544-SEPTIC	685149.1768	1670593.0585
345	685345.6600	1671089.9410	4052.38	OT-C544-SEPTIC	685147.0324	1670605.6239
346	685356.1020	1671079.9660	4041.22	OT-C544-EFLUEN	685157.4713	1670595.6518
347	685347.2700	1671081.8770	4052.36	OT-C544-EFLUEN	685148.6419	1670597.5622
348	685337.4940	1671082.4320	4051.31	OT-C544-FFLUEN	685138.8687	1670598.1171
349	685335.1290	1671082.2690	4051.14	OT-C544-FFLUEN	685136.5044	1670597.9541
350	685336.2280	1671075.8560	4050.85	OT-C544-LEACH	685137.6031	1670591.5430
351	685323.3310	1671071.0830	4049.91	OT-C544-LEACH	685124.7098	1670586.7714
352	685297.8990	1671068.1360	4048.16	OT-C544-LEACH	685099.2852	1670583.8252
353	685296.9990	1671078.2660	4047.94	OT-C544-LEACH	685098.3855	1670593.9523
354	685317.0900	1671090.9580	4049.62	OT-C544-LEACH	685118.4707	1670606.6406
355	685334.6940	1671090.0750	4050.81	OT-C544-LEACH	685136.0696	1670605.7579
356	685360.4020	1671127.4140	4053.89	OT-C544-BLDGCOR	685161.7701	1670643.0860
357	685349.8450	1671114.5020	4052.32	OT-C544-BLDGCOR	685151.2162	1670630.1778
358	685360.3480	1671033.1240	4052.96	OT-C544-BLDGCOR	685161.7161	1670548.8234
359	685371.1230	1671022.2010	4053.70	OT-C544-BLDGCOR	685172.4880	1670537.9035
360	669828.5970	1693339.1960	4077.44	TU/US-C503-STATION1	669634.4665	1692848.4306
361	669823.8520	1693340.4930	4077.30	TU/US-C503-STATION2	669629.7229	1692849.7272
362	669816.1660	1693331.0930	4077.32	TU/US-C503-STATION3	669622.0391	1692840.3299
363	669804.9830	1693324.1990	4077.14	TU/US-C503-STATION5	669610.8594	1692833.4379
364	669830.2120	1693344.6950	4077.63	TU/US-C503-STATION4	669636.0811	1692853.9280

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
365	669820.3680	1693343.5050	4078.10	TU/US-C503-USTTANK	669626.2399	1692852.7383
366	669826.9160	1693337.2450	4077.78	TU/US-C503-USTTANK	669632.7860	1692846.4802
367	669831.7020	1693342.9300	4077.73	TU/US-C503-USTTANK	669637.5706	1692852.1635
368	669817.5060	1693300.2710	4077.28	TU/US-C503-BLDGCOR	669623.3788	1692809.5169
369	669817.0280	1693314.4610	4077.69	TU/US-C503-BLDGCOR	669622.9009	1692823.7028
370	669870.4630	1693326.6030	4077.24	TU/US-C503-BLDGCOR	669676.3204	1692835.8412
371	669857.6770	1693326.9550	4077.12	TU/US-C503-BLDGCOR	669663.5381	1692836.1931
372	669799.9830	1693280.8270	4076.53	TU/US-C503-BLDGCOR	669605.8608	1692790.0785
373	669786.0040	1693280.0690	4077.00	TU/US-C503-BLDGCOR	669591.8859	1692789.3207
374	669753.1970	1693299.5360	4076.55	TU/US-C503-MW1-CASIN	669559.0884	1692808.7821
375	669753.0160	1693299.6510	4076.22	TU/US-C503-MW1-PVC	669558.9075	1692808.8971
376	669717.9520	1693348.6000	4074.92	TU/US-C503-MW3-PVC	669523.8536	1692857.8319
377	669718.0930	1693348.2730	4075.65	TU/US-C503-MW3-CASIN	669523.9946	1692857.5050
378	669746.8950	1693329.2100	4076.92	TU/US-C503-BLDGCOR	669552.7882	1692838.4475
379	669747.5820	1693308.1150	4076.21	TU/US-C503-BLDGCOR	669553.4750	1692817.3586
380	669906.5180	1693361.1640	4077.43	TU/US-C503-MW2-CASIN	669712.3650	1692870.3922
381	669906.2520	1693361.2650	4077.07	TU/US-C503-MW2-PVC	669712.0990	1692870.4932
382	669887.0390	1693344.8910	4077.53	TU/US-C503-BLDGCOR	669692.8916	1692854.1239
383	669886.0230	1693359.0930	4077.99	TU/US-C503-BLDGCOR	669691.8759	1692868.3218
384	670862.3470	1691695.2520	4072.78	TU/US-C500-MW1-CASIN	670667.9169	1691204.9630
385	670862.1340	1691695.4850	4072.39	TU/US-C500-MW1-PVC	670667.7040	1691205.1960
386	670897.1420	1691671.0590	4072.25	TU/US-C500-MW2-PVC	670702.7019	1691180.7771
387	670897.3420	1691670.8340	4072.66	TU/US-C500-MW2-CASIN	670702.9018	1691180.5521
388	670997.2710	1691721.0890	4072.90	TU/US-C500-MW3-CASIN	670802.8018	1691230.7926
389	670996.9840	1691721.2540	4072.41	TU/US-C500-MW3-PVC	670802.5149	1691230.9575
390	670952.1640	1691699.4910	4072.04	TU/US-C500-STATION1	670757.7079	1691209.2008
391	670948.0960	1691682.1740	4072.36	TU/US-C500-STATION4	670753.6411	1691191.8888
392	670936.4590	1691683.8290	4072.05	TU/US-C500-STATION5	670742.0075	1691193.5434
393	670929.6330	1691690.0950	4072.11	TU/US-C500-STATION2	670735.1834	1691199.8075
394	670923.0530	1691673.0510	4072.18	TU/US-C500-STATION3	670728.6054	1691182.7685
395	670946.5050	1691708.7370	4072.40	TU/US-C500-USTPIT	670752.0506	1691218.4441
396	670961.7540	1691693.8260	4072.62	TU/US-C500-USTPIT	670767.2951	1691203.5375
397	670931.1680	1691662.3970	4072.93	TU/US-C500-USTPIT	670736.7180	1691172.1176
398	670915.4940	1691676.4560	4072.43	TU/US-C500-USTPIT	670721.0485	1691186.1725
399	670921.7940	1691667.6910	4072.61	TU/US-C500-BLDGCOR	670727.3467	1691177.4100
400	670938.3020	1691685.3670	4072.19	TU/US-C500-BLDGCOR	670743.8499	1691195.0809
401	670954.8550	1691686.5260	4072.52	TU/US-C500-BLDGCOR	670760.3981	1691196.2396
402	670964.2580	1691691.8600	4072.50	TU/US-C500-BLDGCOR	670769.7984	1691201.5720
403	670981.1410	1691692.8760	4072.84	TU/US-C500-BLDGCOR	670786.6765	1691202.5877
404	681138.2190	1690535.4430	4109.80	OT-C538-MW1-CASING	680940.8108	1690045.4902
405	681137.9660	1690535.5040	4109.43	OT-C538-MW1-PVC	680940.5579	1690045.5512
406	681154.3000	1690506.8540	4109.64	OT-C538-STATION3	680956.8871	1690016.9095
407	681170.7650	1690504.3700	4110.30	OT-C538-STATION2	680973.3473	1690014.4262
408	681207.7160	1690542.9160	4110.07	OT-C538-STATION1	681010.2876	1690052.9610
409	681171.2020	1690513.1430	4110.35	OT-C538-SEPTIC	680973.7842	1690023.1966
410	681160.8350	1690514.8700	4110.22	OT-C538-SEPTIC	680963.4202	1690024.9231
411	681157.5830	1690502.2430	4109.87	OT-C538-SEPTIC	680960.1692	1690012.2998
412	681168.6240	1690500.8410	4110.30	OT-C538-SEPTIC	680971.2070	1690010.8982
413	681157.7430	1690507.8780	4109.92	OT-C538-FFLUEN	680960.3291	1690017.9332
414	681149.7900	1690513.8560	4109.82	OT-C538-FFLUEN	680952.3784	1690023.9094
415	681146.2870	1690511.1610	4109.76	OT-C538-LEACH	680948.8764	1690021.2152
416	681140.0690	1690516.2140	4109.76	OT-C538-LEACH	680942.6602	1690026.2667
417	681131.8360	1690535.6580	4109.59	OT-C538-LEACH	680934.4296	1690045.7051
418	681142.3480	1690541.6090	4109.45	OT-C538-LEACH	680944.9386	1690051.6544
419	681148.4850	1690524.6340	4109.80	OT-C538-LEACH	680951.0738	1690034.6843
420	681152.9240	1690518.6140	4110.01	OT-C538-LEACH	680955.5115	1690028.6661
421	681171.0630	1690513.0040	4110.32	OT-C538-EFLUEN	680973.6453	1690023.0577
422	681199.3120	1690534.6340	4109.92	OT-C538-EFLUEN	681001.8861	1690044.6814
423	681311.9210	1690619.8910	4111.94	OT-C538-EFLUEN	681114.4624	1690129.9137
424	681378.0600	1690614.8720	4112.52	OT-C538-EFLUEN	681180.5823	1690124.8962
425	681511.9950	1690621.0250	4112.35	OT-C538-EFLUEN-C/O	681314.4785	1690131.0474
426	681543.8210	1690614.3290	4112.13	OT-C538-EFLUEN-C/O	681346.2952	1690124.3533
427	681545.1500	1690624.0320	4110.59	OT-C538-EFLUEN	681347.6238	1690134.0535
428	681526.9290	1690617.7410	4112.19	OT-C538-BLDGCOR	681329.4081	1690127.7643
429	681516.5600	1690627.6780	4112.22	OT-C538-BLDGCOR	681319.0421	1690137.6984
430	681517.0030	1690674.6590	4112.55	OT-C538-BLDGCOR	681319.4850	1690184.6658
431	681526.9640	1690685.0850	4112.68	OT-C538-BLDGCOR	681329.4431	1690195.0888
432	681610.3380	1690617.1910	4112.15	OT-C538-BLDGCOR	681412.7929	1690127.2145
433	681620.0290	1690626.9090	4112.29	OT-C538-BLDGCOR	681422.4811	1690136.9297
434	681248.7970	1690511.7190	4110.11	OT-C537-STATION1	681051.3567	1690021.7731
435	681230.2540	1690505.9940	4109.96	OT-C537-STATION2	681032.8191	1690016.0497

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
436	681220.0430	1690509.7920	4110.12	OT-C537-STATION3	681022.6111	1690019.8466
437	681224.9030	1690501.6020	4109.95	OT-C537-SEPTICDRY	681027.4697	1690011.6590
438	681224.2220	1690518.0560	4110.28	OT-C537-SEPTICDRY	681026.7889	1690028.1082
439	681236.7540	1690518.9910	4110.31	OT-C537-SEPTICDRY	681039.3172	1690029.0429
440	681236.4080	1690501.8520	4110.13	OT-C537-SEPTICDRY	681038.9713	1690011.9089
441	681237.2180	1690508.8330	4110.12	OT-C537-INLINE	681039.7811	1690018.8879
442	681311.7430	1690515.4440	4111.03	OT-C537-INLINE	681114.2845	1690025.4970
443	670561.7210	1680587.5740	4050.10	TU/US-C506-MW2-CASIN	670367.3781	1680100.5043
444	670561.4170	1680587.6760	4049.68	TU/US-C506-MW2-PVC	670367.0742	1680100.6062
445	670504.3430	1680580.0920	4050.14	TU/US-C506-MW1-PVC	670310.0167	1680093.0244
446	670504.5340	1680580.0020	4050.56	TU/US-C506-MW1-CASIN	670310.2076	1680092.9345
447	670508.2600	1680580.6030	4050.26	TU/US-C506-USTTANK	670313.9326	1680093.5353
448	670507.1490	1680575.9500	4050.27	TU/US-C506-USTTANK	670312.8219	1680088.8836
449	670517.9280	1680578.9030	4050.27	TU/US-C506-USTTANK	670323.5978	1680091.8358
450	670517.4300	1680574.2280	4050.28	TU/US-C506-USTTANK	670323.0999	1680087.1621
451	670507.9350	1680578.1630	4050.18	TU/US-C506-STATION1	670313.6077	1680091.0960
452	670513.3690	1680579.8330	4050.20	TU/US-C506-STATION2	670319.0401	1680092.7655
453	670517.9640	1680576.4150	4050.25	TU/US-C506-STATION3	670323.6338	1680089.3485
454	670511.2330	1680575.3810	4050.12	TU/US-C506-STATION4	670316.9047	1680088.3148
455	670512.5770	1680577.6370	4050.16	TU/US-C506-STATION5	670318.2483	1680090.5702
456	670485.1820	1680557.6150	4050.53	TU/US-C506-EXMW1-CAS	670290.8613	1680070.5540
457	670484.8980	1680557.6790	4050.38	TU/US-C506-EXMW1-PVC	670290.5773	1680070.6179
458	670494.8180	1680553.5430	4050.36	TU/US-C506-BLDGCOR	670300.4945	1680066.4831
459	670506.7310	1680561.7710	4050.38	TU/US-C506-BLDGCOR	670312.4040	1680074.7088
460	670510.1770	1680607.5970	4050.36	TU/US-C506-BLDGCOR	670315.8490	1680120.5215
461	670507.2460	1680618.1900	4050.39	TU/US-C506-BLDGCOR	670312.9189	1680131.1114
462	672564.5350	1692766.5990	4084.67	OT-C530-STATION1	672369.6116	1692275.9995
463	672567.1650	1692774.7240	4084.79	OT-C530-STATION2	672372.2409	1692284.1222
464	672567.5210	1692771.2850	4084.93	OT-C530-ACTSEPTIC	672372.5967	1692280.6842
465	672572.0780	1692767.3740	4084.89	OT-C530-ACTSEPTIC	672377.1524	1692276.7743
466	672575.8660	1692771.9070	4084.91	OT-C530-ACTSEPTIC	672380.9393	1692281.3060
467	672571.4280	1692775.8290	4084.95	OT-C530-ACTSEPTIC	672376.5026	1692285.2269
468	672569.6900	1692769.3550	4084.91	OT-C530-INLINE	672374.7651	1692278.7547
469	672563.6000	1692772.1360	4084.83	OT-C530-MW-CASING	672368.6769	1692281.5349
470	672563.2920	1692772.2960	4084.49	OT-C530-MW-PVC	672368.3690	1692281.6949
471	672509.9810	1692700.4750	4085.41	OT-C530-INLINE	672315.0734	1692209.8947
472	672538.3940	1692677.7240	4085.37	OT-C530-BLDGCOR	672343.4782	1692187.1503
473	672538.9710	1692663.8680	4085.27	OT-C530-BLDGCOR	672344.0550	1692173.2983
474	672478.3960	1692731.8290	4085.45	OT-C530-BLDGCOR	672283.4976	1692241.2396
475	672485.2490	1692739.1720	4085.12	OT-C530-BLDGCOR	672290.3486	1692248.5805
476	685978.3640	1686617.0530	4101.95	OT-C534-STATION1	685779.5530	1686128.2358
477	685949.9370	1686623.2970	4101.80	OT-C534-STATION2	685751.1342	1686134.4780
478	686041.6810	1686591.0650	4102.58	OT-C534-BLDGCOR	685842.8517	1686102.2553
479	686050.4200	1686580.6970	4102.78	OT-C534-BLDGCOR	685851.5881	1686091.8903
480	686053.7100	1686616.8100	4102.90	OT-C534-BLDGCOR	685854.8772	1686127.9929
481	686043.1140	1686607.6280	4102.82	OT-C534-BLDGCOR	685844.2842	1686118.8135
482	670482.5190	1680558.2400	4050.60	TU/US-C506-MW3-CASIN	670288.1990	1680071.1788
483	670482.3210	1680558.1750	4050.11	TU/US-C506-MW3-PVC	670288.0011	1680071.1138
484	669451.6250	1685381.2210	4054.88	TU/US-C515-STATION1	669257.6038	1684892.7620
485	669456.5920	1685373.9060	4054.66	TU/US-C515-STATION2	669262.5694	1684885.4491
486	669447.7270	1685364.3830	4054.13	TU/US-C515-STATION3	669253.7069	1684875.9289
487	669442.7430	1685375.3260	4054.34	TU/US-C515-STATION4	669248.7244	1684886.8687
488	669450.0780	1685373.9310	4054.62	TU/US-C515-STATION5	669256.0572	1684885.4741
489	669529.8630	1685390.3120	4053.57	TU/US-C515-MW3-PVC	669335.8191	1684901.8503
490	669530.0710	1685390.1630	4053.84	TU/US-C515-MW3-CASIN	669336.0271	1684901.7014
491	669347.3380	1685357.3580	4053.37	TU/US-C515-MW2-CASIN	669153.3470	1684868.9059
492	669347.0390	1685357.4240	4052.93	TU/US-C515-MW2-PVC	669153.0481	1684868.9719
493	669367.7310	1685396.1250	4053.43	TU/US-C515-MW1-PVC	669173.7341	1684907.6617
494	669368.0180	1685396.0880	4053.86	TU/US-C515-MW1-CASIN	669174.0210	1684907.6247
495	669413.7390	1685386.4140	4054.97	TU/US-C515-BLDGCOR	669219.7288	1684897.9535
496	669405.0760	1685397.5400	4056.39	TU/US-C515-BLDGCOR	669211.0683	1684909.0762
497	669442.6490	1685383.8010	4054.90	TU/US-C515-TANKPIT	669248.6304	1684895.3412
498	669458.4310	1685381.6630	4055.08	TU/US-C515-TANKPIT	669264.4078	1684893.2039
499	669454.7400	1685363.6010	4054.47	TU/US-C515-TANKPIT	669260.7179	1684875.1471
500	669440.8050	1685364.3540	4054.07	TU/US-C515-TANKPIT	669246.7869	1684875.8999
501	669474.3460	1685377.9770	4054.82	TU/US-C515-BLDGCOR	669280.3182	1684889.5189
502	669485.4880	1685386.3880	4055.07	TU/US-C515-BLDGCOR	669291.4570	1684897.9275
503	669257.8420	1685415.0700	4053.20	TU/US-C513-STATION3	669063.8770	1684926.6012
504	669241.6200	1685431.8260	4053.43	TU/US-C513-STATION2	669047.6597	1684943.3523
505	669234.6840	1685421.2410	4053.75	TU/US-C513-STATION5	669040.7257	1684932.7704
506	669232.2550	1685409.8190	4053.42	TU/US-C513-STATION4	669038.2974	1684921.3517

RAW DATA

HOLLOMAN AIR FORCE BASE
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Corrections

Point #515
TU/US-515-MW3 PVC

Point #518
TU/US-515-MW2

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
507	669220.1400	1685422.8010	4053.52	TU/US-C513-STATION1	669026.1859	1684934.3299
508	669222.4590	1685431.2530	4053.64	TU/US-C513-TANKPIT	669028.5042	1684942.7795
509	669219.3990	1685411.0450	4054.92	TU/US-C513-TANKPIT	669025.4451	1684922.5773
510	669260.7320	1685426.0370	4053.70	TU/US-C513-TANKPIT	669066.7661	1684937.5650
511	669277.6950	1685433.5720	4053.31	TU/US-C513-MW2-CASIN	669083.7242	1684945.0978
512	669243.5650	1685418.8110	4054.36	TU/US-C513-TRANSPAD	669049.6041	1684930.3411
513	669236.4970	1685419.8090	4054.30	TU/US-C513-TRANSPAD	669042.5381	1684931.3388
514	669235.5680	1685411.9050	4054.57	TU/US-C513-TRANSPAD	669041.6094	1684923.4371
515	669277.6850	1685433.6210	4053.26	TU/US-C513-MW2-C[illegible] PVC	669083.7142	1684945.1468 → MW3
516	669188.9570	1685441.5400	4053.76	TU/US-C513-MW1-CASIN	668995.0119	1684953.0635
517	669188.7180	1685441.6230	4053.31	TU/US-C513-MW1-PVC	668994.7730	1684953.1465
518	669175.0530	1685411.5360	4053.78	TU/US-C513-MW3-PVC	668981.1120	1684923.0682 → MW2
519	669175.2900	1685411.4450	4054.15	TU/US-C513-MW3-CASIN	668981.3489	1684922.9772
520	669194.6820	1685411.4540	4054.72	TU/US-C513-BLDGCOR	669000.7353	1684922.9862
521	669205.8290	1685420.1440	4054.47	TU/US-C513-BLDGCOR	669011.8790	1684931.6737
522	669292.6520	1685418.3920	4053.83	TU/US-C513-BLDGCOR	669098.6769	1684929.9222
523	669293.9380	1685428.2990	4053.77	TU/US-C513-BLDGCOR	669099.9625	1684939.8263
524	685879.9040	1686627.7590	4102.02	OTC-534-CASING	685681.1215	1686138.9387
525	685879.6290	1686627.7910	4101.61	OTC-534-PVC	685680.8466	1686138.9707
526	685894.0510	1686651.2940	4102.15	OTC-534-MW6-CASING	685695.2644	1686162.4669
527	685893.7240	1686651.3020	4101.74	OTC-534-MW6-PVC	685694.9375	1686162.4749
528	685866.3710	1686655.8860	4101.59	OTC-534-MW8-PVC	685667.5925	1686167.0576
529	685866.6060	1686655.6520	4102.06	OTC-534-MW8-CASING	685667.8274	1686166.8236
530	685876.1160	1686687.3140	4102.11	OTC-534-MW5-CASING	685677.3346	1686198.4764
531	685875.8760	1686687.4250	4101.81	OTC-534-MW5-PVC	685677.0947	1686198.5874
532	685834.9910	1686704.4610	4101.83	OTC-534-MW9-PVC	685636.2216	1686215.6185
533	685835.2820	1686704.5300	4102.15	OTC-534-MW9-CASING	685636.5125	1686215.6875
534	685772.4780	1686595.2240	4101.45	OTC-534-MW10-NG	685573.7267	1686106.4131
535	669081.1480	1678793.1860	4046.72	OTC-531B-SEPTANK	668887.2342	1678306.6363
536	669082.4390	1678801.3130	4046.63	OTC-531B-SEPTANK	668888.5248	1678314.7610
537	669072.3810	1678802.9790	4046.81	OTC-531B-SEPTANK	668878.4697	1678316.4265
538	669070.8860	1678795.3530	4046.82	OTC-531B-SEPTANK	668876.9751	1678308.8027
539	669104.1410	1678787.7690	4045.69	OTC-531B-STATION-1	668910.2205	1678301.2209
540	669070.9690	1678801.9800	4046.52	OTC-531B-STATION-2	668877.0581	1678315.4278
541	669061.4820	1678787.2510	4046.24	OTC-531B-STATION-3	668867.5739	1678300.7031
542	669022.2810	1678760.4940	4045.98	OTC-531B-MW-1-PVC	668828.3842	1678273.9538
543	669022.4740	1678760.4670	4046.35	OTC-531B-MW-1-CASING	668828.5772	1678273.9268
544	669029.7060	1678750.8610	4046.12	OTC-531B-LEACH	668835.8071	1678264.3236
545	669044.0770	1678753.3070	4046.04	OTC-531B-LEACH	668850.1739	1678266.7689
546	669048.2090	1678762.3910	4046.19	OTC-531B-LEACH	668854.3047	1678275.8503
547	669052.8600	1678773.5200	4046.17	OTC-531B-LEACH	668858.9544	1678286.9760
548	669051.8580	1678782.0380	4046.19	OTC-531B-LEACH	668857.9527	1678295.4916
549	669045.9680	1678791.0410	4045.97	OTC-531B-LEACH	668852.0644	1678304.4920
550	669037.6080	1678787.3270	4046.05	OTC-531B-LEACH	668843.7068	1678300.7790
551	669030.8940	1678787.9690	4046.07	OTC-531B-LEACH	668836.9947	1678301.4208
552	669024.6850	1678794.4050	4045.99	OTC-531B-LEACH	668830.7875	1678307.8550
553	669012.0060	1678808.0140	4045.98	OTC-531B-LEACH	668818.1122	1678321.4600
554	669005.0390	1678788.3970	4045.95	OTC-531B-LEACH	668811.1472	1678301.8487
555	669008.1540	1678771.5710	4046.05	OTC-531B-LEACH	668814.2613	1678285.0276
556	669012.3090	1678761.0960	4046.10	OTC-531B-LEACH	668818.4151	1678274.5556
557	669052.5660	1678784.6580	4046.08	OTC-531B-FLINE	668858.6605	1678298.1108
558	669071.4380	1678798.9230	4046.55	OTC-531B-FLINE	668877.5270	1678312.3717
559	669082.2160	1678797.7200	4046.58	OTC-531B-ELINE	668888.3019	1678311.1690
560	669109.7160	1678792.3340	4045.64	OTC-531B-ELINE	668915.7939	1678305.7846
561	669130.6340	1678787.5660	4047.05	OTC-531B-ELINE	668936.7058	1678301.0180
562	669132.6960	1678800.0880	4046.87	OTC-531B-BLDGCOR	668938.7672	1678313.5363
563	669139.6540	1678804.9540	4046.97	OTC-531B-BLDGCOR	668945.7232	1678318.4009
564	669127.3740	1678771.5760	4046.72	OTC-531B-BLDGCOR	668933.4468	1678285.0326
565	669131.8520	1678764.6150	4047.25	OTC-531B-BLDGCOR	668937.9235	1678278.0736
566	668593.1300	1678901.9680	4046.19	OTC-531C-BLDGCOR	668399.3576	1678415.3868
567	668588.1250	1678902.8360	4046.21	OTC-531C-BLDGCOR	668394.3541	1678416.2546
568	668585.3350	1678865.5840	4046.55	OTC-531C-BLDGCOR	668391.5649	1678379.0133
569	668590.1110	1678858.6070	4046.53	OTC-531C-BLDGCOR	668396.3395	1678372.0384
570	668590.3090	1678889.4560	4045.95	OTC-531C-ELINE	668396.5374	1678402.8784
571	668578.4210	1678891.4650	4046.03	OTC-531C-ELINE	668384.6529	1678404.8868
572	668560.7680	1678894.7530	4045.47	OTC-531C-ELINE	668367.0050	1678408.1739
573	668535.6480	1678899.2930	4046.35	OTC-531C-ELINE	668341.8923	1678412.7126
574	668535.0660	1678896.4960	4046.68	OTC-531C-SEPTIC	668341.3104	1678409.9164
575	668535.3940	1678905.9700	4046.47	OTC-531C-SEPTIC	668341.6383	1678419.3876
576	668522.2510	1678906.9450	4046.51	OTC-531C-SEPTIC	668328.4992	1678420.3624
577	668522.3100	1678897.4040	4046.39	OTC-531C-SEPTIC	668328.5581	1678410.8241

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
578	668561.9930	1678890.5660	4045.66	OTC-531C-STATION-1	668368.2296	1678403.9881
579	668531.2500	1678902.0810	4046.55	OTC-531C-STATION-2	668337.4955	1678415.4998
580	668522.9580	1678893.5110	4045.84	OTC-531C-STATION-3	668329.2059	1678406.9323
581	668521.6100	1678902.7660	4046.16	OTC-531C-FLINE	668327.8583	1678416.1846
582	668515.2610	1678901.5740	4045.66	OTC-531C-FLINE	668321.5112	1678414.9929
583	668515.8520	1678907.4010	4045.67	OTC-531C-LEACH	668322.1020	1678420.8182
584	668498.6960	1678906.8280	4045.81	OTC-531C-LEACH	668304.9510	1678420.2454
585	668489.9270	1678907.6430	4045.74	OTC-531C-LEACH	668296.1845	1678421.0602
586	668481.5760	1678902.8790	4045.69	OTC-531C-LEACH	668287.8359	1678416.2975
587	668476.1180	1678891.3230	4045.84	OTC-531C-LEACH	668282.3795	1678404.7449
588	668473.4290	1678883.0340	4045.68	OTC-531C-LEACH	668279.6913	1678396.4583
589	668473.7340	1678874.2510	4045.53	OTC-531C-LEACH	668279.9962	1678387.6778
590	668476.2360	1678867.2340	4045.54	OTC-531C-LEACH	668282.4975	1678380.6629
591	668482.1720	1678868.3950	4045.45	OTC-531C-MW-1-PVC	668288.4318	1678381.8235
592	668482.4510	1678868.3680	4045.85	OTC-531C-MW-1-CASING	668288.7107	1678381.7965
593	668490.9400	1678863.0190	4045.60	OTC-531C-LEACH	668297.1972	1678376.4491
594	668503.3450	1678866.8310	4045.87	OTC-531C-LEACH	668309.5986	1678380.2600
595	668508.4050	1678874.1920	4045.93	OTC-531C-LEACH	668314.6572	1678387.6189
596	668515.8970	1678879.7420	4045.82	OTC-531C-LEACH	668322.1470	1678393.1672
597	668524.3970	1678890.3500	4045.70	OTC-531C-LEACH	668330.6445	1678403.7722
598	667495.6300	1679128.7300	4042.53	OTC-532-BLDGCOR	667302.1757	1678642.0831
599	667488.6400	1679123.9580	4042.71	OTC-532-BLDGCOR	667295.1877	1678637.3125
600	667462.6660	1679059.4970	4041.10	OTC-532-BLDGCOR	667269.2212	1678572.8701
601	667481.1840	1679050.1710	4042.61	OTC-532-BLDGCOR	667287.7339	1678563.5469
602	667486.0130	1679106.7520	4042.73	OTC-532-ELINE	667292.5615	1678620.1115
603	667462.4800	1679111.5030	4040.38	OTC-532-ELINE	667269.0353	1678624.8611
604	667462.2250	1679114.4150	4040.62	OTC-532-STATION-1	667268.7804	1678627.7722
605	667442.0090	1679119.1410	4041.24	OTC-532-STATION-2	667248.5702	1678632.4969
606	667419.1640	1679115.1840	4040.86	OTC-532-STATION-3	667225.7319	1678628.5410
607	667385.6930	1679101.6040	4040.50	OTC-532-STATION-4	667192.2706	1678614.9649
608	667381.8850	1679101.5680	4040.62	OTC-532-LEACH	667188.4637	1678614.9290
609	667383.6400	1679091.6130	4040.63	OTC-532-LEACH	667190.2181	1678604.9768
610	667385.4250	1679087.0370	4040.57	OTC-532-LEACH	667192.0026	1678600.4022
611	667388.9960	1679084.4040	4040.65	OTC-532-LEACH	667195.5726	1678597.7699
612	667394.2390	1679084.6140	4040.73	OTC-532-LEACH	667200.8141	1678597.9799
613	667396.1210	1679092.7430	4040.70	OTC-532-LEACH	667202.6955	1678606.1065
614	667398.1240	1679100.9150	4040.70	OTC-532-LEACH	667204.6979	1678614.2761
615	667402.2360	1679106.9240	4040.75	OTC-532-LEACH	667208.8088	1678620.2834
616	667410.1270	1679109.8530	4040.82	OTC-532-LEACH	667216.6975	1678623.2116
617	667419.4540	1679110.1630	4040.85	OTC-532-LEACH	667226.0218	1678623.5215
618	667420.7270	1679120.1400	4041.02	OTC-532-FLINE	667227.2944	1678633.4956
619	667423.8510	1679141.7780	4040.59	OTC-532-LEACH	667230.4175	1678655.1273
620	667412.2990	1679143.4760	4040.74	OTC-532-LEACH	667218.8688	1678656.8248
621	667403.7350	1679143.1670	4040.80	OTC-532-LEACH	667210.3073	1678656.5159
622	667397.0900	1679139.6510	4040.75	OTC-532-LEACH	667203.6642	1678653.0009
623	667384.3300	1679127.9250	4040.44	OTC-532-LEACH	667190.9079	1678641.2783
624	667382.6070	1679116.1130	4040.44	OTC-532-LEACH	667189.1854	1678629.4697
625	667430.4810	1679118.6630	4041.32	OTC-532-FLINE	667237.0456	1678632.0190
626	667430.2210	1679114.2980	4041.25	OTC-532-SEPTIC	667236.7856	1678627.6553
627	667440.5880	1679113.0200	4041.26	OTC-532-SEPTIC	667247.1496	1678626.3776
628	667442.9470	1679123.3120	4041.21	OTC-532-SEPTIC	667249.5080	1678636.6667
629	667430.1210	1679125.8580	4041.28	OTC-532-SEPTIC	667236.6857	1678639.2119
630	667441.8110	1679116.2010	4041.27	OTC-532-ELINE	667248.3723	1678629.5577
631	669659.5140	1678688.1920	4048.05	OTC-531A-ELINE	669465.4326	1678201.6728
632	669645.1200	1678691.4170	4047.42	OTC-531A-ELINE	669451.0427	1678204.8968
633	669626.5240	1678694.6570	4048.54	OTC-531A-ELINE	669432.4521	1678208.1359
634	669625.4550	1678690.5680	4048.58	OTC-531A-SEPTIC	669431.3834	1678204.0481
635	669627.0130	1678697.2200	4048.59	OTC-531A-SEPTIC	669432.9410	1678210.6981
636	669614.1180	1678700.1730	4048.60	OTC-531A-SEPTIC	669420.0497	1678213.6503
637	669613.0940	1678693.8150	4048.72	OTC-531A-SEPTIC	669419.0260	1678207.2941
638	669648.5430	1678685.0250	4047.24	OTC-531A-STATION-1	669454.4647	1678198.5067
639	669615.3510	1678691.9600	4048.59	OTC-531A-STATION-2	669421.2823	1678205.4397
640	669607.0140	1678691.1700	4048.42	OTC-531A-STATION-3	669412.9478	1678204.6499
641	669606.7200	1678688.2040	4048.56	OTC-531A-LEACH	669412.6539	1678201.6848
642	669608.9270	1678706.1330	4048.28	OTC-531A-LEACH	669414.8602	1678219.6086
643	669601.3790	1678707.8980	4048.13	OTC-531A-LEACH	669407.3144	1678221.3730
644	669593.2420	1678708.2220	4047.49	OTC-531A-LEACH	669399.1798	1678221.6970
645	669578.1380	1678708.5010	4047.22	OTC-531A-LEACH	669384.0801	1678221.9759
646	669565.0490	1678706.1840	4047.29	OTC-531A-LEACH	669370.9949	1678219.6595
647	669554.2260	1678694.3690	4047.37	OTC-531A-LEACH	669360.1751	1678207.8480
648	669553.4160	1678687.6760	4047.59	OTC-531A-LEACH	669359.3653	1678201.1569

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
649	669552.5940	1678678.4030	4047.76	OTC-531A-LEACH	669358.5435	1678191.8866
650	669550.0120	1678656.4050	4047.76	OTC-531A-LEACH	669355.9623	1678169.8950
651	669556.1880	1678652.3190	4047.86	OTC-531A-LEACH	669362.1365	1678165.8102
652	669559.2580	1678655.8340	4047.38	OTC-531A-MW-1-PVC	669365.2056	1678169.3241
653	669559.5100	1678655.7600	4047.78	OTC-531A-MW-1-CASING	669365.4575	1678169.2502
654	669561.9190	1678650.8880	4047.69	OTC-531A-LEACH	669367.8658	1678164.3796
655	669569.0970	1678659.8040	4048.02	OTC-531A-LEACH	669375.0418	1678173.2930
656	669574.5390	1678669.0420	4047.77	OTC-531A-LEACH	669380.4822	1678182.5283
657	669580.0480	1678677.6210	4047.77	OTC-531A-LEACH	669385.9896	1678191.1048
658	669581.1180	1678685.2190	4047.72	OTC-531A-LEACH	669387.0593	1678198.7006
659	669589.3790	1678690.0080	4047.91	OTC-531A-LEACH	669395.3179	1678203.4882
660	669598.7410	1678687.4540	4047.88	OTC-531A-LEACH	669404.6772	1678200.9350
661	669608.6000	1678697.8630	4048.38	OTC-531A-FLINE	669414.5333	1678211.3410
662	669613.4950	1678697.0050	4048.61	OTC-531A-FLINE	669419.4269	1678210.4832
663	669434.7190	1685385.1220	4055.15	US/TC-515-EXAVATION	669240.7027	1684896.6618
664	669433.7320	1685375.0770	4054.68	US/TC-515-EXAVATION	669239.7160	1684886.6198
665	669453.6100	1685372.2880	4054.89	US/TC-515-EXAVATION	669259.5882	1684883.8316
666	669455.2490	1685382.6100	4055.08	US/TC-515-EXAVATION	669261.2268	1684894.1506
667	669423.1290	1685379.3360	4054.73	US/TC-515-POTHOLE-1	669229.1161	1684890.8775
668	669443.7270	1685362.1260	4054.20	US/TC-515-POTHOLE-2	669249.7081	1684873.6725
669	669443.2340	1685352.4030	4053.69	US/TC-515-POTHOLE-3	669249.2152	1684863.9523
670	669388.8600	1685382.9350	4054.36	US/TC-515-POTHOLE-4	669194.8570	1684894.4755
671	666075.3380	1693454.3920	4059.75	US/TC-502-TANK/EX	665882.2953	1692963.5932
672	666064.5480	1693454.6090	4059.59	US/TC-502-TANK/EX	665871.5084	1692963.8101
673	666064.5890	1693463.2320	4059.66	US/TC-502-TANK/EX	665871.5494	1692972.4306
674	666075.7420	1693463.6580	4059.85	US/TC-502-TANK/EX	665882.6992	1692972.8565
675	666070.2430	1693458.8620	4059.56	US/TC-502-STATION-1	665877.2018	1692968.0619
676	666075.3470	1693459.1030	4059.61	US/TC-502-STATION-2	665882.3043	1692968.3028
677	666070.4890	1693455.0470	4059.46	US/TC-502-STATION-3	665877.4477	1692964.2480
678	666070.2650	1693463.1340	4059.49	US/TC-502-STATION-4	665877.2238	1692972.3327
679	666072.2440	1693503.2780	4060.12	US/TC-502-FIREHY	665879.2022	1693012.4650
680	669813.9600	1693315.1950	4077.70	US/TC-503-EXAVATION	669619.8338	1692824.4365
681	669826.0790	1693326.7460	4077.45	US/TC-503-EXAVATION	669631.9493	1692835.9842
682	669815.4720	1693337.1950	4077.67	US/TC-503-EXAVATION	669621.3454	1692846.4302
683	669803.8000	1693324.4750	4077.59	US/TC-503-EXAVATION	669609.6767	1692833.7139
684	669818.2990	1693319.1730	4077.48	US/TC-503-BEGTRENCH	669624.1715	1692828.4134
685	669837.0790	1693303.2490	4076.88	US/TC-503-ENDTRENCH	669642.9461	1692812.4940
686	681138.0180	1690539.4590	4109.33	OTC-538-STATION-5	680940.6098	1690049.5050
687	673758.3950	1683356.5480	4060.55	US/TC-514-STATION-1	673563.1256	1682868.6758
688	673765.5540	1683358.1250	4060.47	US/TC-514-STATION-2	673570.2825	1682870.2523
689	673770.0890	1683350.4240	4060.48	US/TC-514-STATION-3	673574.8162	1682862.5535
690	673768.2490	1683354.2670	4060.48	US/TC-514-STATION-4	673572.9768	1682866.3954
691	673777.4280	1683353.4050	4060.71	US/TC-514-STATION-5	673582.1531	1682865.5337
692	673776.8350	1683359.0390	4060.94	US/TC-514-BLDGCOR	673581.5603	1682871.1661
693	673769.7480	1683353.9100	4060.70	US/TC-514-BLDGCOR	673574.4753	1682866.0385
694	673778.8570	1683370.4750	4060.92	US/TC-514-BLDGCOR	673583.5817	1682882.5987
695	673773.9440	1683377.3380	4060.70	US/TC-514-BLDGCOR	673578.6701	1682889.4597
696	673723.3370	1683411.0030	4060.56	US/TC-514-MW-1-PVC	673528.0778	1682923.1150
697	673723.6160	1683410.9000	4061.02	US/TC-514-MW-1-CASIN	673528.3567	1682923.0120
698	673699.2890	1683380.7720	4061.09	US/TC-514-MW-2-CASIN	673504.0367	1682892.8928
699	673698.9660	1683380.8260	4060.66	US/TC-514-MW-2-PVC	673503.7138	1682892.9467
700	673812.5550	1683317.4880	4060.43	US/TC-514-MW-3-PVC	673617.2699	1682829.6271
701	673812.8820	1683317.4350	4060.76	US/TC-514-MW-3-CASIN	673617.5968	1682829.5741
702	673776.7270	1683350.1350	4060.82	US/TC-514-FORM/TANK	673581.4523	1682862.2646
703	673777.3420	1683356.4370	4060.94	US/TC-514-FORM/TANK	673582.0671	1682868.5648
704	673759.1130	1683359.4810	4061.06	US/TC-514-FORM/TANK	673563.8434	1682871.6079
705	673757.7990	1683353.3170	4061.32	US/TC-514-FORM/TANK	673562.5298	1682865.4457
706	678061.9490	1684350.2580	4078.63	US/TC-516-FORMTANK	677865.4323	1683862.0978
707	678072.0100	1684348.4740	4078.61	US/TC-516-FORMTANK	677875.4904	1683860.3143
708	678074.0860	1684360.1530	4078.25	US/TC-516-FORMTANK	677877.5658	1683871.9899
709	678065.1290	1684362.4260	4078.47	US/TC-516-FORMTANK	677868.6114	1683874.2622
710	678069.6040	1684359.8850	4078.30	US/TC-516-STATION-1	677873.0851	1683871.7220
711	678064.5960	1684356.9350	4078.34	US/TC-516-STATION-2	677868.0786	1683868.7728
712	678066.1670	1684350.4200	4078.54	US/TC-516-STATION-3	677869.6491	1683862.2597
713	678072.9250	1684354.8490	4078.09	US/TC-516-STATION-4	677876.4052	1683866.6874
714	678101.7280	1684311.2380	4077.72	US/TC-516-MW-2	677905.1998	1683823.0891
715	678116.9250	1684291.3650	4077.78	US/TC-516-MW-2	677920.3924	1683803.2218
716	678061.7680	1684335.2520	4080.38	US/TC-516-BLDGCOR	677865.2514	1683847.0961
717	678064.6310	1684348.2080	4081.07	US/TC-516-BLDGCOR	677868.1136	1683860.0484
718	678026.7560	1684390.7900	4078.49	US/TC-516-MW-1	677830.2495	1683902.6180
719	678014.0050	1684363.8290	4077.81	US/TC-516-MW-3	677817.5022	1683875.6648

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
720	671269.9880	1692357.3370	4075.08	US/TC-508-FORM/TANK	671075.4398	1691866.8562
721	671299.4450	1692330.8640	4075.18	US/TC-508-FORM/TANK	671104.8883	1691840.3908
722	671324.3300	1692358.5130	4075.17	US/TC-508-FORM/TANK	671129.7661	1691868.0318
723	671294.8560	1692384.8580	4075.02	US/TC-508-FORM/TANK	671100.3006	1691894.3692
724	671311.5950	1692346.0080	4075.12	US/TC-508-STATION-2	671117.0347	1691855.5304
725	671302.2680	1692357.1830	4075.07	US/TC-508-STATION-1	671107.7104	1691866.7022
726	671312.4640	1692368.2800	4074.98	US/TC-508-STATION-4	671117.9035	1691877.7960
727	671282.5110	1692369.9060	4075.01	US/TC-508-STATION-3	671087.9592	1691879.4215
728	671289.2400	1692342.4620	4075.15	US/TC-508-STATION-5	671094.6862	1691851.9855
729	671373.3210	1692386.6060	4075.00	US/TC-508-MW-3-PVC	671178.7429	1691896.1167
730	671373.6120	1692386.5000	4075.33	US/TC-508-MW-3-CASIN	671179.0338	1691896.0107
731	671216.9160	1692488.1670	4075.54	US/TC-508-SS18-MW08-CASIN	671022.3832	1691997.6482
732	671216.7110	1692488.4340	4075.26	US/TC-508-SS18-MW08-PVC	671022.1782	1691997.9152
733	671236.3110	1692301.9320	4075.19	US/TC-508-MW-2-CASIN	671041.7726	1691811.4672
734	671236.1240	1692302.1450	4074.80	US/TC-508-MW-2-PVC	671041.5856	1691811.6801
735	671211.3090	1692324.4610	4075.35	US/TC-508-MW-1-CASIN	671016.7778	1691833.9897
736	671211.0360	1692324.6620	4074.93	US/TC-508-MW-1-PVC	671016.5049	1691834.1906
737	671174.1880	1692241.9700	4074.81	US/TC-508-SS18-MW16-PVC	670979.6676	1691751.5226
738	671174.4770	1692241.7880	4075.34	US/TC-508-SS18-MW16-CASIN	670979.9565	1691751.3406
739	671035.8870	1692106.1030	4074.42	US/TC-508-SS18-MW18-CASIN	670841.4066	1691615.6950
740	671035.6230	1692106.3690	4073.74	US/TC-508-SS18-MW18-PVC	670841.1427	1691615.9609
741	671043.1730	1692355.2630	4075.73	US/TC-508-SS18-MW19-PVC	670848.6905	1691864.7828
742	670383.2120	1691278.5670	4072.57	US/TC-504-MW-2-CASIN	670188.9208	1690788.3988
743	670383.0220	1691278.7790	4072.19	US/TC-504-MW-2-PVC	670188.7309	1690788.6107
744	670343.7050	1691297.2270	4072.57	US/TC-504-MW-1-PVC	670149.4253	1690807.0534
745	670343.9460	1691296.8630	4072.80	US/TC-504-MW-1-CASIN	670149.6662	1690806.6895
746	669680.3630	1678704.0610	4048.54	OTC-531A-BLDGCOR	669486.2755	1678217.5372
747	669673.4280	1678699.1340	4048.44	OTC-531A-BLDGCOR	669479.3425	1678212.6116
748	669662.1160	1678671.3190	4048.32	OTC-531A-BLDGCOR	669468.0338	1678184.8047
749	669671.0810	1678657.6480	4048.29	OTC-531A-BLDGCOR	669476.9962	1678171.1376
750	669671.6690	1678686.6260	4048.54	OTC-531A-ELINE	669477.5840	1678200.1072
751	670995.2900	1691723.6540	4072.55	US/TC-500-STATION-6	670800.8214	1691233.3568
752	682707.7150	1693994.3080	4139.12	OTC-539-SEPTIC	682509.8519	1693503.3527
753	682707.1360	1693987.5070	4139.01	OTC-539-SEPTIC	682509.2731	1693496.5537
754	682713.9270	1693987.3840	4139.07	OTC-539-SEPTIC	682516.0621	1693496.4307
755	682714.4020	1693993.8490	4139.12	OTC-539-SEPTIC	682516.5370	1693502.8939
756	682710.5050	1693994.2530	4139.11	OTC-539-ELINE	682512.6411	1693503.2977
757	682711.7750	1694038.3560	4139.83	OTC-539-ELINE	682513.9107	1693547.3880
758	682709.6340	1694009.1330	4139.38	OTC-539-STATION-1	682511.7704	1693518.1734
759	682715.9010	1693990.7160	4139.12	OTC-539-STATION-2	682518.0355	1693499.7618
760	682707.9950	1693985.7400	4139.05	OTC-539-STATION-3	682510.1318	1693494.7872
761	682690.1540	1693966.7430	4138.58	OTC-539-STATION-4	682492.2960	1693475.7957
762	682700.5510	1693984.6270	4139.10	OTC-539-LEACH	682502.6900	1693493.6745
763	682694.7220	1693978.9800	4138.75	OTC-539-LEACH	682496.8627	1693488.0292
764	682685.8570	1693975.5370	4138.62	OTC-539-LEACH	682488.0002	1693484.5872
765	682686.8260	1693963.6500	4138.56	OTC-539-LEACH	682488.9690	1693472.7036
766	682690.9260	1693959.9730	4138.78	OTC-539-LEACH	682493.0678	1693469.0277
767	682696.9840	1693956.9410	4138.94	OTC-539-LEACH	682499.1240	1693465.9966
768	682705.4410	1693958.5980	4139.12	OTC-539-LEACH	682507.5786	1693467.6531
769	682714.7430	1693968.3290	4139.32	OTC-539-LEACH	682516.8779	1693477.3813
770	682721.4010	1693976.8710	4139.30	OTC-539-LEACH	682523.5339	1693485.9208
771	682717.7930	1693983.8070	4139.35	OTC-539-LEACH	682519.9270	1693492.8548
772	682710.1830	1693984.5790	4139.16	OTC-539-FLINE	682512.3192	1693493.6265
773	682710.2190	1693987.2160	4139.18	OTC-539-FLINE	682512.3552	1693496.2628
774	682690.6020	1694039.4720	4139.43	OTC-539-BLDGCOR	682492.7439	1693548.5036
775	682684.8200	1694045.5030	4139.27	OTC-539-BLDGCOR	682486.9635	1693554.5329
776	682741.4000	1694039.0240	4140.22	OTC-539-BLDGCOR	682543.5271	1693548.0558
777	682747.1830	1694045.0970	4140.68	OTC-539-BLDGCOR	682549.3085	1693554.1270

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7824
PROFESSIONAL SURVEYOR

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
778	686068.4560	1686694.7280	4103.68	OTC-534-MW-10-PVC	685869.6189	1686205.8883
779	686068.7800	1686694.7810	4104.06	OTC-534-MW-10-CASING	685869.9428	1686205.9413
780	685846.6180	1686522.2590	4102.52	OTC-534-MW-11-CASING	685647.8452	1686033.4693
781	685846.3620	1686522.2240	4102.15	OTC-534-MW-11-PVC	685647.5893	1686033.4343
782	685670.3280	1686561.9490	4102.29	OTC-534-MW-12-PVC	685471.6063	1686073.1478
783	685670.6410	1686561.9860	4102.69	OTC-534-MW-12-CASING	685471.9192	1686073.1848

RAW DATA

HOLLOMAN AIR FORCE BASE
WEST SITE

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	684793.2210	1611172.5300	3911.93	BASE	684598.9178	1610715.3759
2	682531.9480	1628747.6200	3965.57	EC-30	682338.2864	1628285.4792
3	682452.1330	1628714.0920	3957.20	EC-30-2	682258.4940	1628251.9607
4	698323.2620	1606321.3780	3915.08	CHAS	698125.1198	1605865.6004
5	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
60	616427.1730	1576921.6540	3941.67	LUCERO	616252.2680	1576474.2182
61	600657.7750	1576446.9260	4131.58	GERI	600487.3444	1575999.6249
62	614156.5210	1568701.1170	4227.09	SW 30	613982.2602	1568256.0137
63	575518.1130	1586543.7100	4038.20	BRYCE AZ MK	575354.8155	1586093.5441
64	576512.9440	1582067.6800	4357.70	BRYCE	576349.3642	1581618.7841
65	633185.2600	1566510.7280	4417.64	HORN	633005.6000	1566066.2462
66	580320.9040	1585783.2080	4128.59	NICK 2	580156.2437	1585333.2579
67	682452.1790	1628714.1810	3957.10	EC-30-2	682258.5400	1628252.0496
68	698323.2620	1606321.3780	3914.70	CHAS	698125.1198	1605865.6004
69	698212.0050	1609477.2870	3928.40	CHUCK	698013.8943	1609020.6139
70	682531.9020	1628747.5310	3965.57	EC-30	682338.2404	1628285.3902
71	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
100	684194.1900	1611160.8710	3912.56	USTC-518-NG	684000.0567	1610703.7202
101	684194.8810	1611165.7430	3912.33	USTC-518-NG	684000.7475	1610708.5908
102	684188.7970	1611168.5190	3912.27	USTC-518-NG	683994.6653	1610711.3660
103	684189.4230	1611176.5450	3912.53	USTC-518-NG	683995.2911	1610719.3898
104	684179.6480	1611178.5150	3912.57	USTC-518-NG	683985.5189	1610721.3592
105	684178.1630	1611171.1680	3912.37	USTC-518-NG	683984.0343	1610714.0143
106	684177.1790	1611163.0630	3913.00	USTC-518-NG	683983.0506	1610705.9116
107	684157.6940	1611173.6700	3912.42	USTC-518-STATION-5	683963.5711	1610716.5156
108	684176.2170	1611179.5100	3912.28	USTC-518-STATION-4	683982.0888	1610722.3539
109	684175.8730	1611172.3430	3912.51	USTC-518-STATION-2	683981.7449	1610715.1890
110	684173.8830	1611163.3430	3912.65	USTC-518-STATION-3	683979.7555	1610706.1915
111	684189.5770	1611170.0220	3912.30	USTC-518-STATION-1	683995.4450	1610712.8686
112	684160.3220	1611172.8640	3912.49	USTC-518-POTHOLE-1	683966.1984	1610715.7098
113	684125.1520	1611185.2360	3910.93	USTC-518-MW-1	683931.0383	1610728.0783
114	684130.9190	1611216.0540	3911.17	USTC-518-MW-2	683936.8037	1610758.8876
115	684158.8770	1611187.1610	3912.34	USTC-518-BLDGCORN-70	683964.7538	1610730.0028
116	684163.9700	1611180.4420	3912.46	USTC-518-BLDGCORN-70	683969.8453	1610723.2857
117	684211.6690	1611174.1790	3912.47	USTC-518-BLDGCORN-70	684017.5308	1610717.0244
118	684218.3800	1611179.3060	3912.45	USTC-518-BLDGCORN-70	684024.2399	1610722.1500
119	684236.0190	1611144.8000	3911.88	USTC-518-NAIL	684041.8739	1610687.6538
120	684242.7800	1611133.9130	3911.77	USTC-518-NAIL	684048.6330	1610676.7699
121	684203.7200	1611162.6570	3912.21	USTC-518-STATION-6	684009.5840	1610705.5057

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I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7924
PROFESSIONAL SURVEYOR

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-078

Appendix I
Laboratory Analytical Data and Data Validation Checklists

Note: The data validation checklists and laboratory analytical data reports are provided as separate files.

Appendix J
Waste Manifests

HAFB-001

Generator's Name	Generator's Address	Generator's Telephone No.
USAF	550 TABOSA AVE Holloman AFB NM 88330	575-491-8262

Origin of Special Waste (Project or Spill Location): ~~White Sands National Monument Park - Storage Lagoons~~ Holloman AFB NM Bldg # 55

Transporter #1 Company Name	Address	Telephone No.
Southwest Disposal	1350 LaVelle Road	575-434-1109
Transporter #2 Company Name	Address	Telephone No.
	Alamogordo, NM 88310	

Destination Facility Name/Site Address	Facility ID (Permit) Number	Telephone No.
Otero/Greentree Regional Landfill 24 Mls South of Alamogordo, Hwy 54	SWM-109102	575-439-4355

Type and Proper Name of Special Waste	Container(s) No.	Container(s) Type	Total Quantity	Unit Wt/Vol	
Non RCRA/Non Hazardous Substance ~~(Treatment Plant Lagoon Sludge)~~ (soil)		SD		6.95	Tons

Additional Descriptions for Special Waste Listed Above:

Site Contact: Todd Hiltunen 307-214-6080

Special Handling Instructions:

Southwest Disposal - Lined and Covered Roll-off

GENERATOR'S CERTIFICATION I hereby certify that the contents of this shipment are fully and accurately described above by type and proper name of the special waste, and that such waste has been managed, packaged, containerized and labeled in accordance with the requirements of 20.9.8 NMAC (Special Waste Requirements) in addition to any other applicable federal, state or local regulations.

Truck # 553 Bin #

Printed/Typed Name:	Signature:	Date:
Todd Hiltunen for Brent Hunt (CES)	for Brent Hunt (CES)	9/25/12

Transporter 1 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:
David Gurnbach		9/26/12

Transporter 2 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:

Discrepancy Indication Space:

Analytical supplied to landfill

no facility ID number

Facility Owner or Operator: ***I hereby acknowledge receipt of the special waste as indicated upon this manifest, except as noted above in the Discrepancy Indication Space.***

Printed/Typed Name:	Signature:	Date:
Darrell McGinnis / Attendant		9-26-12

~~Facility~~

OTERO/GREENTREE
REGIONAL LANDFILL

TRANSACTION: 28,080

CO. NAME:

ADDRESS: Environmental Waste Solutions
1348 B. Redtail Hawk Drive

CITY & STATE: Boardman, OH 44512

DATE: 9/26/12 TIME: 9:07 am

TRUCK NO.: 198

GROSS WEIGHT 47000

TARE WEIGHT: 33100

NET TONS: 13900 6.95

COST $: [redacted]

5% TAX $:

TOTAL DUE $:

WASTE: 5

WASTE DESC.: Construction Debris
H.A.F.B.

WASTE ORIGIN:

DRIVER

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-078

Appendix K
Risk Evaluation Calculations

Table K-1
Manganese

Site-specific
Resident Equation Inputs for Tap Water

Variable	Value
TR (target cancer risk) unitless	0.00001
ED_r (exposure duration - resident) year	30
ED_c (exposure duration - child) year	6
ED_a (exposure duration - adult) year	24
ED_{0-2} (mutagenic exposure duration first phase) year	2
ED_{2-6} (mutagenic exposure duration second phase) year	4
ED_{6-16} (mutagenic exposure duration third phase) year	10
ED_{16-30} (mutagenic exposure duration fourth phase) year	14
THQ (target hazard quotient) unitless	1
LT (lifetime - resident) year	70
EF_r (exposure frequency) day/year	350
EF_{0-2} (mutagenic exposure frequency first phase) day/year	350
EF_{2-6} (mutagenic exposure frequency second phase) day/year	350
EF_{6-16} (mutagenic exposure frequency third phase) day/year	350
EF_{16-30} (mutagenic exposure frequency fourth phase) day/year	350
ET_{rw-adj} (age-adjusted exposure time) hour/day	0.664
$ET_{rw-madj}$ (mutagenic age-adjusted exposure time) hour/day	0.664
ET_{rwa} (adult tapwater exposure time) hour/day	0.58
ET_{rwc} (child tapwater exposure time) hour/day	1
ET_r (exposure time - resident) hour/day	24
ET_{0-2} (mutagenic exposure time first phase) hour/event	1
ET_{2-6} (mutagenic exposure time second phase) hour/event	1
ET_{6-16} (mutagenic exposure time third phase) hour/event	0.58
ET_{16-30} (mutagenic exposure time fourth phase) hour/event	0.58
BW_a (body weight - adult) kg	70
BW_c (body weight - child) kg	15
IRW_a (water intake rate - adult) L/day	2
IRW_c (water intake rate - child) L/day	1
EV_{rwa} (adult events) per day	1
EV_{rwc} (child events) per day	1
EV_{0-2} (mutagenic events first phase) per day	1
EV_{2-6} (mutagenic events first phase) per day	1
EV_{6-16} (mutagenic events first phase) per day	1
EV_{16-30} (mutagenic events first phase) per day	1
K (volatilization factor of Andelman) L/m^3	0.5
IFW_{adj} (adjusted intake factor) L-year/kg-day	1.086
$IFWM_{adj}$ (mutagenic adjusted intake factor) L-year/kg-day	3.39
DFW_{adj} (age-adjusted dermal factor) cm^2-event/kg	8811.4
$DFWM_{adj}$ (mutagenic age-adjusted dermal factor) cm^2-event/kg	25394.29
SA_a (skin surface area - adult) cm^2	18000
SA_c (skin surface area - child) cm^2	6600
IRW_{0-2} (mutagenic water intake rate) L/hr	1
IRW_{2-6} (mutagenic water intake rate) L/hr	1
IRW_{6-16} (mutagenic water intake rate) L/hr	2
IRW_{16-30} (mutagenic water intake rate) L/hr	2
l_{sc} (apparent thickness of stratum corneum) cm	0.001

Output generated 04DEC2012:13:07:47

Table K-1
Manganese

Site-specific
Resident Risk-Based Screening Levels (RSL) for Tap Water
ca=Cancer, nc=Noncancer, ca* (Where nc SL < 100 x ca SL),
ca** (Where nc SL < 10 x ca SL),
max=SL exceeds ceiling limit (see User's Guide), sat=SL exceeds csat

Chemical	CAS Number	Chemical Type	Ingestion SF $(mg/kg\text{-}day)^{-1}$	SFO Ref	Inhalation Unit Risk $(ug/m^3)^{-1}$	IUR Ref	Chronic RfD (mg/kg-day)	RfD Ref	Chronic RfC (mg/m^3)	RfC Ref	VOC	GIABS	KP
Manganese (Non-diet)	7439-96-5	Inorganics	-		-		2.40E-02	S	5.00E-05	I	0	0.04	0.001

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Table K-1
Manganese

MW	pi	logds	dsclc	dsc	c	littleb	B	tstar	tau_event	FA	In EPD?	DAeventc	DAeventn	MCL ug/L
54.94	3.1415927	-3.107664	0.0007804	7.8043E-7	0.3352366	0.3050181	0.0028508	0.5125355	0.2135565	1	Yes	-	0.0022753	-

Table K-1
Manganese

Ingestion SL TR=1.0E-5 (ug/L)	Dermal SL TR=1.0E-5 (ug/L)	Inhalation SL TR=1.0E-5 (ug/L)	Carcinogenic SL TR=1.0E-5 (ug/L)	Ingestion SL HQ=1 (ug/L)	Dermal SL HQ=1 (ug/L)	Inhalation SL HQ=1 (ug/L)	Noncarcinogenic SL HI=1 (ug/L)	Screening Level (ug/L)
-	-	-	-	3.75E+02	2.28E+03	-	3.22E+02	3.22E+02 nc

Table K-2
Thallium

Site-specific
Resident Equation Inputs for Tap Water

Variable	Value
TR (target cancer risk) unitless	0.00001
ED_r (exposure duration - resident) year	30
ED_c (exposure duration - child) year	6
ED_a (exposure duration - adult) year	24
ED_{0-2} (mutagenic exposure duration first phase) year	2
ED_{2-6} (mutagenic exposure duration second phase) year	4
ED_{6-16} (mutagenic exposure duration third phase) year	10
ED_{16-30} (mutagenic exposure duration fourth phase) year	14
THQ (target hazard quotient) unitless	1
LT (lifetime - resident) year	70
EF_r (exposure frequency) day/year	350
EF_{0-2} (mutagenic exposure frequency first phase) day/year	350
EF_{2-6} (mutagenic exposure frequency second phase) day/year	350
EF_{6-16} (mutagenic exposure frequency third phase) day/year	350
EF_{16-30} (mutagenic exposure frequency fourth phase) day/year	350
ET_{rw-adj} (age-adjusted exposure time) hour/day	0.664
$ET_{rw-madj}$ (mutagenic age-adjusted exposure time) hour/day	0.664
ET_{rwa} (adult tapwater exposure time) hour/day	0.58
ET_{rwc} (child tapwater exposure time) hour/day	1
ET_{rw} (exposure time - resident) hour/day	24
ET_{0-2} (mutagenic exposure time first phase) hour/event	1
ET_{2-6} (mutagenic exposure time second phase) hour/event	1
ET_{6-16} (mutagenic exposure time third phase) hour/event	0.58
ET_{16-30} (mutagenic exposure time fourth phase) hour/event	0.58
BW_a (body weight - adult) kg	70
BW_c (body weight - child) kg	15
IRW_a (water intake rate - adult) L/day	2
IRW_c (water intake rate - child) L/day	1
EV_{rwa} (adult events) per day	1
EV_{rwc} (child events) per day	1
EV_{0-2} (mutagenic events first phase) per day	1
EV_{2-6} (mutagenic events first phase) per day	1
EV_{6-16} (mutagenic events first phase) per day	1
EV_{16-30} (mutagenic events first phase) per day	1
K (volatilization factor of Andelman) L/m^3	0.5
IFW_{adj} (adjusted intake factor) L-year/kg-day	1.086
$IFWM_{adj}$ (mutagenic adjusted intake factor) L-year/kg-day	3.39
DFW_{adj} (age-adjusted dermal factor) cm^2-event/kg	8811.4
$DFWM_{adj}$ (mutagenic age-adjusted dermal factor) cm^2-event/kg	25394.29
SA_a (skin surface area - adult) cm^2	18000
SA_c (skin surface area - child) cm^2	6600
IRW_{0-2} (mutagenic water intake rate) L/hr	1
IRW_{2-6} (mutagenic water intake rate) L/hr	1
IRW_{6-16} (mutagenic water intake rate) L/hr	2
IRW_{16-30} (mutagenic water intake rate) L/hr	2
l_{sc} (apparent thickness of stratum corneum) cm	0.001

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Table K-2
Thallium

Site-specific
Resident Screening Levels (RSL) for Tap Water
ca=Cancer, nc=Noncancer, ca* (Where nc SL < 100 x ca SL),
ca** (Where nc SL < 10 x ca SL), max=SL exceeds ceiling limit (see User's Guide), sat=SL exceeds csat,
Smax=Soil SL exceeds ceiling limit and has been substituted with the max value (see User's Guide),
Ssat=Soil inhalation SL exceeds csat and has been substituted with the csat

Chemical	CAS Number	Mutagen?	VOC ?	Chemical Type	Ingestion SF $(mg/kg\text{-}day)^{-1}$	SFO Ref	Inhalation Unit Risk $(ug/m^3)^{-1}$	IUR Ref	Chronic RfD (mg/kg-day)	RfD Ref	Chronic RfC (mg/m^3)	RfC Ref	VOC	GIABS
Thallium (Soluble Salts)	7440-28-0	No	No	Inorganics	-		-		1.00E-05	X	-		0	1

Output generated 20JUN2013:13:56:57

Table K-2
Thallium

KP	MW	pi	logds	dsclc	dsc	Concentration (mg/kg)	littleb	B	tstar	tau_event	FA	In EPD?	DAeventc	DAeventn
0.001	204.38	3.1415927	-3.944528	0.0001136	1.1362E-7	0.337009	0.3066309	0.0054985	3.5203674	1.4668198	1	Yes	-	0.0000237

Table K-2
Thallium

MCL ug/L	Ingestion SL TR=1.0E-5 (ug/L)	Dermal SL TR=1.0E-5 (ug/L)	Inhalation SL TR=1.0E-5 (ug/L)	Carcinogenic SL TR=1.0E-5 (ug/L)	Ingestion SL HQ=1 (ug/L)	Dermal SL HQ=1 (ug/L)	Inhalation SL HQ=1 (ug/L)	Noncarcinogenic SL HI=1 (ug/L)	Screening Level (ug/L)
2.00E+00	-	-	-	-	1.56E-01	2.37E+01	-	1.55E-01	1.55E-01 nc

Risk Additivity
Soil Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531A-IS-0001-071012		OTC531A-IS-0002-071012		OTC531A-IS-0003-071012		OTC531A-IS-0004-071012-FD		OTC531A-IS-0005-071012-		OTC531A-IS-0006-071012		OTC531A-IS-0007-071012		OTC531A-IS-0008-071012		OTC531A-IS-0009-071012		OTC531A-IS-0010-071012		OTC531A-IS-0011-071012	
			Sample Date	7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012	
			Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		11.5 - 13.5	
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE	**87.9**		**78.1**		**86.5**		**85.7**		**71.9**		**85.9**		**84.1**		**86.5**		**81.8**		**85.7**		**78.3**	
VOLATILES (mg/kg)																									
1,1,1-TRICHLOROETHANE	NE	8700	15600	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0013	U	0.0018	U	0.0016	U	0.0013	U	0.0021	U	0.0015	U	0.0012	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02	0.0015	U	0.0016	U	0.0017	U	0.0019	U	0.0014	U	0.0019	U	0.0017	U	0.0014	U	0.0023	U	0.0017	U	0.0013	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100	0.0022	U	0.0022	U	0.0024	U	0.0027	U	0.002	U	0.0027	U	0.0024	U	0.0019	U	0.0033	U	0.0024	U	0.0019	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0013	U	0.0018	U	0.0016	U	0.0013	U	0.0021	U	0.0015	U	0.0012	U
1,1-DICHLOROETHANE	NE	3.3	64.5	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0013	U	0.0018	U	0.0016	U	0.0013	U	0.0021	U	0.0015	U	0.0012	U
1,1-DICHLOROETHENE	NE	240	449	0.0018	U	0.0018	U	0.002	U	0.0022	U	0.0016	U	0.0023	U	0.002	U	0.0016	U	0.0027	U	0.002	U	0.0015	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0	0.0015	U	0.0016	U	0.0017	U	0.0019	U	0.0014	U	0.0019	U	0.0017	U	0.0014	U	0.0023	U	0.0017	U	0.0013	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86	0.0029	U	0.003	U	0.0033	U	0.0037	U	0.0027	U	0.0037	U	0.0033	U	0.0026	U	0.0045	U	0.0032	U	0.0025	U
1,2-DIBROMOETHANE	NE	0.034	0.588	0.0013	U	0.0013	U	0.0014	U	0.0016	U	0.0012	U	0.0016	U	0.0014	U	0.0011	U	0.0019	U	0.0014	U	0.0011	U
1,2-DICHLOROBENZENE	NE	1900	2310	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0013	U	0.0018	U	0.0016	U	0.0013	U	0.0021	U	0.0015	U	0.0012	U
1,2-DICHLOROETHANE	NE	0.43	7.89	0.0013	U	0.0013	U	0.0014	U	0.0016	U	0.0012	U	0.0016	U	0.0014	U	0.0011	U	0.0019	U	0.0014	U	0.0011	U
1,2-DICHLOROPROPANE	NE	0.94	15.2	0.0015	U	0.0016	U	0.0017	U	0.0019	U	0.0014	U	0.0019	U	0.0017	U	0.0014	U	0.0023	U	0.0017	U	0.0013	U
1,3-DICHLOROBENZENE	NE	NE	NE	0.0015	U	0.0016	U	0.0017	U	0.0019	U	0.0014	U	0.0019	U	0.0017	U	0.0014	U	0.0023	U	0.0017	U	0.0013	U
1,4-DICHLOROBENZENE	NE	2.4	31.7	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0013	U	0.0018	U	0.0016	U	0.0013	U	0.0021	U	0.0015	U	0.0012	U
2-HEXANONE	NE	210	NE	0.0069	U	0.007	U	0.0077	U	0.0086	U	0.0063	U	0.0087	U	0.0077	U	0.0062	U	0.011	U	0.0075	U	0.0059	U
ACETONE	NE	61000	66600	0.025	U	0.026	U	0.029	U	0.032	U	0.023	U	0.032	U	0.029	U	0.023	U	0.039	U	0.028	U	0.022	U
BENZENE	NE	1.1	15.4	0.0019	U	0.0019	U	0.0021	U	0.0024	U	0.0018	U	0.0024	U	0.0021	U	0.0017	U	0.0029	U	0.0021	U	0.0016	U
BROMODICHLOROMETHANE	NE	0.27	5.41	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0013	U	0.0018	U	0.0016	U	0.0013	U	0.0021	U	0.0015	U	0.0012	U
BROMOFORM	NE	62	616	0.0019	U	0.0019	U	0.0021	U	0.0024	U	0.0018	U	0.0024	U	0.0021	U	0.0017	U	0.0029	U	0.0021	U	0.0016	U
BROMOMETHANE	NE	7.3	16.5	0.0025	U	0.0026	U	0.0029	U	0.0032	U	0.0023	U	0.0032	U	0.0029	U	0.0023	U	0.0039	U	0.0028	U	0.0022	U
CARBON DISULFIDE	NE	820	1530	0.0025	U	0.0026	U	0.0029	U	0.0032	U	0.0023	U	0.0032	U	0.0029	U	0.0023	U	0.0039	U	0.0028	U	0.0022	U
CARBON TETRACHLORIDE	NE	0.61	10.8	0.0023	U	0.0023	U	0.0026	U	0.0029	U	0.0021	U	0.0029	U	0.0026	U	0.0021	U	0.0035	U	0.0025	U	0.002	U
CHLOROBENZENE	NE	290	376	0.0013	U	0.0013	U	0.0014	U	0.0016	U	0.0012	U	0.0016	U	0.0014	U	0.0011	U	0.0019	U	0.0014	U	0.0011	U
CHLOROETHANE	NE	15000	29800	0.0025	U	0.0026	U	0.0029	U	0.0032	U	0.0023	U	0.0032	U	0.0029	U	0.0023	U	0.0039	U	0.0028	U	0.0022	U
CHLOROFORM	NE	0.29	5.86	0.0015	U	0.0016	U	0.0017	U	0.0019	U	0.0014	U	0.0019	U	0.0017	U	0.0014	U	0.0023	U	0.0017	U	0.0013	U
CHLOROMETHANE	NE	120	275	0.0025	U	0.0026	U	0.0029	U	0.0032	U	0.0023	U	0.0032	U	0.0029	U	0.0023	U	0.0039	U	0.0028	U	0.0022	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156	0.0019	U	0.0019	U	0.0021	U	0.0024	U	0.0018	U	0.0024	U	0.0021	U	0.0017	U	0.0029	U	0.0021	U	0.0016	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	0.0013	U	0.0013	U	0.0014	U	0.0016	U	0.0012	U	0.0016	U	0.0014	U	0.0011	U	0.0019	U	0.0014	U	0.0011	U
CYCLOHEXANE	NE	7000	NE	0.0018	U	0.0018	U	0.002	U	0.0022	U	0.0016	U	0.0023	U	0.002	U	0.0016	U	0.0027	U	0.002	U	0.0015	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1	0.0013	U	0.0013	U	0.0014	U	0.0016	U	0.0012	U	0.0016	U	0.0014	U	0.0011	U	0.0019	U	0.0014	U	0.0011	U
DICHLORODIFLUOROMETHANE	NE	94	168	0.0019	U	0.0019	U	0.0021	U	0.0024	U	0.0018	U	0.0024	U	0.0021	U	0.0017	U	0.0029	U	0.0021	U	0.0016	U
ETHYLBENZENE	NE	5.4	68.4	0.0013	U	0.0013	U	0.0014	U	0.0016	U	0.0012	U	0.0016	U	0.0014	U	0.0011	U	0.0019	U	0.0014	U	0.0011	U
ISOPROPYLBENZENE	NE	2100	2430	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0013	U	0.0018	U	0.0016	U	0.0013	U	0.0021	U	0.0015	U	0.0012	U
METHYL ACETATE	NE	78000	78200	0.016	U	0.016	U	0.018	U	0.02	U	0.015	U	0.02	U	0.018	U	0.014	U	0.024	U	0.017	U	0.014	U
METHYL ETHYL KETONE	NE	28000	37100	0.0077	U	0.0079	U	0.0087	U	0.0098	U	0.0071	U	0.0098	U	0.0087	U	0.007	U	0.012	U	0.0085	U	0.0067	U
METHYL ISOBUTYL KETONE	NE	5300	5820	0.007	U	0.0071	U	0.0079	U	0.0088	U	0.0064	U	0.0088	U	0.0079	U	0.0063	U	0.011	U	0.0077	U	0.006	U
METHYLCYCLOHEXANE	NE	5630	5630	0.0017	U	0.0017	U	0.0019	U	0.0021	U	0.0015	U	0.0021	U	0.0019	U	0.0015	U	0.0025	U	0.0018	U	0.0014	U
METHYLENE CHLORIDE	NE	56	409	0.0058	U	0.0059	U	0.0066	U	0.0074	U	0.0054	U	0.0074	U	0.0066	U	0.0053	U	0.009	U	0.0064	U	0.005	U

Risk Additivity
Soil Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531A-IS-0001-071012		OTC531A-IS-0002-071012		OTC531A-IS-0003-071012		OTC531A-IS-0004-071012-FD		OTC531A-IS-0005-071012-		OTC531A-IS-0006-071012		OTC531A-IS-0007-071012		OTC531A-IS-0008-071012		OTC531A-IS-0009-071012		OTC531A-IS-0010-071012		OTC531A-IS-0011-071012	
			Sample Date	7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012	
			Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		11.5 - 13.5	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																									
STYRENE	NE	6300	7280	0.0033	U	0.0034	U	0.0037	U	0.0042	U	0.003	U	0.0042	U	0.0037	U	0.003	U	0.0051	U	0.0036	U	0.0028	U
TERT-BUTYL METHYL ETHER	NE	43	901	0.0025	U	0.0026	U	0.0029	U	0.0032	U	0.0023	U	0.0032	U	0.0029	U	0.0023	U	0.0039	U	0.0028	U	0.0022	U
TETRACHLOROETHYLENE	NE	22	7.02	0.0013	U	0.0013	U	0.0014	U	0.0016	U	0.0012	U	0.0016	U	0.0014	U	0.0011	U	0.0019	U	0.0014	U	0.0011	U
TOLUENE	NE	5000	5270	0.0015	U	0.0016	U	0.0017	U	0.0019	U	0.0014	U	0.0019	U	0.0017	U	0.0014	U	0.0023	U	0.0017	U	0.0013	U
TRANS-1,2-DICHLOROETHENE	NE	150	270	0.0019	U	0.0019	U	0.0021	U	0.0024	U	0.0018	U	0.0024	U	0.0021	U	0.0017	U	0.0029	U	0.0021	U	0.0016	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0013	U	0.0018	U	0.0016	U	0.0013	U	0.0021	U	0.0015	U	0.0012	U
TRICHLOROETHYLENE	NE	0.91	8.77	0.0015	U	0.0016	U	0.0017	U	0.0019	U	0.0014	U	0.0019	U	0.0017	U	0.0014	U	0.0023	U	0.0017	U	0.0013	U
TRICHLOROFLUOROMETHANE	NE	790	1410	0.0025	U	0.0026	U	0.0029	U	0.0032	U	0.0023	U	0.0032	U	0.0029	U	0.0023	U	0.0039	U	0.0028	U	0.0022	U
VINYL CHLORIDE	NE	0.06	0.728	0.0019	U	0.0019	U	0.0021	U	0.0024	U	0.0018	U	0.0024	U	0.0021	U	0.0017	U	0.0029	U	0.0021	U	0.0016	U
XYLENES, TOTAL	NE	630	814	0.0041	U	0.0041	U	0.0046	U	0.0051	U	0.0037	U	0.0051	U	0.0046	U	0.0037	U	0.0062	U	0.0045	U	0.0035	U
SEMIVOLATILES (mg/kg)																									
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	0.019	UJ	0.021	UJ	0.019	UJ	0.02	UJ	0.023	UJ	0.02	UJ	0.02	UJ	0.019	UJ	0.02	UJ	0.02	UJ	0.021	UJ
2,4,5-TRICHLOROPHENOL	NE	6100	6110	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
2,4-DICHLOROPHENOL	NE	180	183	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
2,4-DIMETHYLPHENOL	NE	1200	1220	0.024	U	0.027	U	0.024	U	0.025	U	0.03	U	0.025	U	0.025	U	0.024	U	0.026	U	0.025	U	0.026	U
2,4-DINITROPHENOL	NE	120	122	0.38	U	0.43	U	0.39	U	0.4	U	0.47	U	0.39	U	0.4	U	0.39	U	0.41	U	0.39	U	0.42	U
2,4-DINITROTOLUENE	NE	1.6	15.7	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
2,6-DINITROTOLUENE	NE	61	61.1	0.022	U	0.025	U	0.023	U	0.023	U	0.028	U	0.023	U	0.024	U	0.023	U	0.024	U	0.023	U	0.025	U
2-CHLORONAPHTHALENE	NE	6300	6260	0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
2-CHLOROPHENOL	NE	390	391	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
2-METHYLNAPHTHALENE	NE	230	NE	0.019	U	0.021	U	**0.0814**	J	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
2-METHYLPHENOL	NE	3100	NE	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
2-NITROANILINE	NE	610	NE	0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
2-NITROPHENOL	NE	NE	NE	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
3-NITROANILINE	NE	NE	NE	0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	0.076	U	0.086	U	0.077	U	0.079	U	0.094	U	0.079	U	0.08	U	0.078	U	0.081	U	0.079	U	0.084	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
4-CHLOROANILINE	NE	2.4	NE	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
4-NITROANILINE	NE	24	NE	0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
4-NITROPHENOL	NE	NE	NE	0.15	U	0.17	U	0.15	U	0.16	U	0.19	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.17	U
ACENAPHTHENE	NE	3400	3440	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
ACENAPHTHYLENE	NE	NE	NE	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
ACETOPHENONE	NE	7800	7820	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
ANTHRACENE	NE	17000	17200	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
ATRAZINE	NE	2.1	NE	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U

Risk Additivity
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Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531A-IS-0001-071012		OTC531A-IS-0002-071012		OTC531A-IS-0003-071012		OTC531A-IS-0004-071012-FD		OTC531A-IS-0005-071012-		OTC531A-IS-0006-071012		OTC531A-IS-0007-071012		OTC531A-IS-0008-071012		OTC531A-IS-0009-071012		OTC531A-IS-0010-071012		OTC531A-IS-0011-071012	
			Sample Date	7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012	
			Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		11.5 - 13.5	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																									
BENZALDEHYDE	NE	7800	NE	0.19	U	0.21	U	0.19	U	0.2	U	0.23	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.21	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
BENZO(A)PYRENE	NE	0.015	0.148	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
BIPHENYL	NE	51	57.1	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.076	U	0.086	U	0.077	U	0.079	U	0.094	U	0.079	U	0.08	U	0.078	U	0.081	U	0.079	U	0.084	U
CAPROLACTAM	NE	31000	NE	0.061	U	0.069	U	**0.0687**	J	0.063	U	0.075	U	0.063	U	0.064	U	0.062	U	0.065	U	0.063	U	0.067	U
CARBAZOLE	NE	NE	NE	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
CHRYSENE	NE	15	148	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
DIBENZOFURAN	NE	78	NE	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
DIETHYL PHTHALATE	NE	49000	48900	0.076	U	0.086	U	0.077	U	0.079	U	0.094	U	0.079	U	0.08	U	0.078	U	0.081	U	0.079	U	0.084	U
DIMETHYL PHTHALATE	NE	611000	611000	0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.076	U	0.086	U	0.077	U	0.079	U	0.094	U	0.079	U	0.08	U	0.078	U	0.081	U	0.079	U	0.084	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
FLUORANTHENE	NE	2300	2290	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
FLUORENE	NE	2300	2290	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.084	UJ	0.094	UJ	0.085	UJ	0.087	UJ	0.1	UJ	0.087	UJ	0.088	UJ	0.085	UJ	0.089	UJ	0.086	UJ	0.092	UJ
HEXACHLOROETHANE	NE	12	42.8	0.038	U	0.043	U	0.039	U	0.04	U	0.047	U	0.039	U	0.04	U	0.039	U	0.041	U	0.039	U	0.042	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
ISOPHORONE	NE	510	5120	0.019	UJ	0.021	UJ	0.019	UJ	0.02	UJ	0.023	UJ	0.02	UJ	0.02	UJ	0.019	UJ	0.02	UJ	0.02	UJ	0.021	UJ
M,P-CRESOL	NE	NE	NE	0.027	U	0.031	U	0.028	U	0.028	U	0.034	U	0.028	U	0.029	U	0.028	U	0.029	U	0.028	U	0.03	U
NAPHTHALENE	NE	3.6	43.0	0.03	U	0.034	U	**0.0318**	J	0.032	U	0.038	U	0.032	U	0.032	U	0.031	U	0.032	U	0.031	U	0.034	U
NITROBENZENE	NE	4.8	53.5	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.23	U	0.26	U	0.23	U	0.24	U	0.28	U	0.24	U	0.24	U	0.23	U	0.24	U	0.24	U	0.25	U
PHENANTHRENE	NE	1830	1830	0.019	U	0.021	U	0.0274	J	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
PHENOL	NE	18000	18300	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U
PYRENE	NE	1700	1720	0.019	U	0.021	U	0.019	U	0.02	U	0.023	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.021	U

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Analyte			Sample Number	OTC531A-IS-0001-071012		OTC531A-IS-0002-071012		OTC531A-IS-0003-071012		OTC531A-IS-0004-071012-FD		OTC531A-IS-0005-071012-		OTC531A-IS-0006-071012		OTC531A-IS-0007-071012		OTC531A-IS-0008-071012		OTC531A-IS-0009-071012		OTC531A-IS-0010-071012		OTC531A-IS-0011-071012	
			Sample Date	7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012	
			Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		11.5 - 13.5	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																									
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
1,3-DINITROBENZENE	NE	6.10	NE	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
2,4-DINITROTOLUENE	NE	1.60	15.7	0.085	U	0.085	U	0.091	U	0.094	U	0.083	U	0.093	U	0.096	U	0.09	U	0.083	U	0.095	U	0.092	U
2,6-DINITROTOLUENE	NE	61.0	61.1	0.077	U	0.077	U	0.082	U	0.084	U	0.074	U	0.083	U	0.086	U	0.081	U	0.074	U	0.085	U	0.082	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
2-NITROTOLUENE	NE	2.90	29.1	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
3-NITROTOLUENE	NE	6.10	7.82	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
4-NITROTOLUENE	NE	30.0	244.4	0.089	U	0.089	U	0.095	U	0.098	U	0.086	U	0.097	U	0.1	U	0.094	U	0.086	U	0.099	U	0.095	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
NITROBENZENE	NE	4.80	53.5	0.082	U	0.082	U	0.087	U	0.09	U	0.079	U	0.089	U	0.092	U	0.087	U	0.079	U	0.091	U	0.088	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
TETRYL	NE	240.0	244.0	0.07	U	0.07	U	0.075	U	0.077	U	0.068	U	0.077	U	0.079	U	0.074	U	0.068	U	0.078	U	0.075	U
METALS (mg/kg)																									
ALUMINUM	13722	77000	78000	**5260**		**1890**		**2250**		**2880**		**1850**		**1090**		**1860**		**1280**		**1330**		**5740**		**1160**	
ANTIMONY	1.6	31	31.3	0.99	U	0.96	U	0.97	U	1.1	U	1.1	U	1	U	0.92	U	1.1	UJ	1.2	U	1	U	1.1	U
ARSENIC	3.7	0.39	3.90	**1.5**	J	0.96	U	0.97	U	1.1	U	1.1	U	1	U	0.92	U	1.1	U	1.2	U	**1.3**	J	1.1	U
BARIUM	169	15000	15600	**66.2**	J	**16.9**	J	**24.6**	J	**33.4**	J	**18.6**	J	**27.8**	J	**20.3**	J	**12.7**	J	**12.1**	J	**37.2**	J	**13.5**	J
BERYLLIUM	1.6	160	156	0.49	U	0.48	U	0.49	U	0.57	U	0.57	U	0.52	U	0.46	U	0.57	U	0.58	U	0.51	U	0.56	U
CADMIUM	0.3	70	70.3	0.49	U	0.48	U	0.49	U	0.57	U	0.57	U	0.52	U	0.46	U	0.57	UJ	0.58	U	0.51	U	0.56	U
CALCIUM	317332	NE	NE	**141000**		**250000**		**219000**		**222000**		**228000**		**209000**		**246000**		**224000**		**176000**		**160000**		**205000**	
CHROMIUM[d]	25	117000	117000	**4.6**	J	**1.7**	J	**1.7**	J	**2.6**	J	**1.7**	J	**0.69**	J	**1.6**	J	**1.7**	J	**1.1**	J	**5.1**		**1**	J
COBALT	7.7	23	NE	**1.7**	J	**0.61**	J	**0.88**	J	**1**	J	0.57	U	0.52	U	**0.61**	J	0.57	U	0.58	U	**2**	J	0.56	U
COPPER	13	3100	3130	**2.8**	J	**1.1**	J	**2.2**	J	**2.6**	J	**1.4**	J	**2.1**	J	**1.5**	J	**1.1**	J	**1.8**	J	**4.7**	J	**1.4**	J
IRON	23049	55000	54800	**4830**		**1770**		**1980**		**2440**		**1750**		**836**		**1620**		**1150**		**1210**		**4590**		**1030**	
LEAD	10.9	400	400	**2.3**	J	**0.48**	J	**1.1**	J	**0.67**	J	0.57	U	0.52	U	0.46	U	0.57	U	0.58	U	**2**	J	0.56	U
MAGNESIUM	16991	NE	NE	**1870**	J	**962**	J	**2150**	J	**2380**	J	**1410**	J	**970**	J	**1090**	J	**971**	J	**920**	J	**6810**		**972**	J
MANGANESE	393	1800	1860	**76**		**25.2**		**36.4**		**46.7**		**22.3**		**15.3**		**27.5**		**19.8**		**17.9**		**121**		**22.5**	
MERCURY	0.0108	10	15.6	0.009	U	0.0098	U	0.009	U	0.0094	U	0.011	U	0.0094	U	0.0094	U	0.0092	U	0.0093	U	0.0088	U	0.01	U
NICKEL	17.4	1500	1560	**3.7**	J	**1.2**	J	**1.7**	J	**2.2**	J	**0.98**	J	**0.8**	J	**1.3**	J	0.01	U	**0.72**	J	**4.1**	J	**0.85**	J
POTASSIUM	5077	NE	NE	**1700**	J	**577**	J	**657**	J	**1270**	J	**605**	J	**534**	J	**631**	J	0.01	U	**486**	J	**1820**	J	**314**	J
SELENIUM	1.4	390	391	2	U	1.9	U	1.9	U	2.3	U	2.3	U	2.1	U	1.8	U	0.01	U	2.3	U	2	U	2.2	U
SILVER	1.1	390	391	0.49	U	0.48	U	0.49	U	0.57	U	0.57	U	0.52	U	0.46	U	0.01	U	0.58	U	0.51	U	0.56	U
SODIUM	5196	NE	NE	**920**	J	530	U	**837**	J	**1290**	J	**2070**	J	**1480**	J	**697**	J	0.01	U	**1020**	J	**3530**	J	**1440**	J
THALLIUM	1.3	0.78	0.782	1.3	U	1.2	U	1.3	U	1.5	U	1.5	U	1.4	U	1.2	U	1.5	U	1.5	U	1.3	U	1.5	U
VANADIUM	42.6	390	391	**12.1**	J	**3.6**	J	**5.6**	J	**6.2**	J	**3.7**	J	**2.3**	J	**3.2**	J	**2.4**	J	**2.5**	J	**9.6**	J	**1.9**	J
ZINC	54.6	23000	23500	**12.3**		**3.8**	J	**8.9**	J	**6.6**	J	**4.1**	J	2.6	U	**3.7**	J	2.9	U	**3.8**	J	**14.2**		2.8	U

Risk Additivity
Soil Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531A-IS-0001-071012		OTC531A-IS-0002-071012		OTC531A-IS-0003-071012		OTC531A-IS-0004-071012-FD		OTC531A-IS-0005-071012-		OTC531A-IS-0006-071012		OTC531A-IS-0007-071012		OTC531A-IS-0008-071012		OTC531A-IS-0009-071012		OTC531A-IS-0010-071012		OTC531A-IS-0011-071012	
			Sample Date	7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012	
			Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		11.5 - 13.5	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																									
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0075	U	0.0085	U	0.0077	U	0.0077	U	0.0092	U	0.0076	U	0.0078	U	0.0077	U	0.0081	U	0.0078	U	0.0084	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.0093	U	0.011	U	0.0096	U	0.0096	U	0.012	U	0.0095	U	0.0098	U	0.0096	U	0.01	U	0.0097	U	0.011	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.0093	U	0.011	U	0.0096	U	0.0096	U	0.012	U	0.0095	U	0.0098	U	0.0096	U	0.01	U	0.0097	U	0.011	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0075	U	0.0085	U	0.0077	U	0.0077	U	0.0092	U	0.0076	U	0.0078	U	0.0077	U	0.0081	U	0.0078	U	0.0084	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0075	U	0.0085	U	0.0077	U	0.0077	U	0.0092	U	0.0076	U	**0.0526**		0.0077	U	0.0081	U	0.0078	U	0.0084	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0075	U	0.0085	U	0.0077	U	0.0077	U	0.0092	U	0.0076	U	0.0078	U	0.0077	U	0.0081	U	0.0078	U	0.0084	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0075	U	0.0085	U	0.0077	U	0.0077	U	0.0092	U	0.0076	U	0.0078	U	0.0077	U	0.0081	U	0.0078	U	0.0084	U
PETROLEUM HYDROCARBONS (mg/kg)																									
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	4	U	5.5	U	3.9	U	4.3	U	3.7	U	3.7	U	4.3	U	3.9	U	3.6	U	5.1	U	3	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	3.8	U	4.3	U	3.8	U	3.8	U	4.6	U	3.9	U	**4.13**	J	3.9	U	4.1	U	3.8	U	4.2	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000	3.8	U	4.3	U	3.8	U	3.8	U	4.6	U	3.9	U	3.9	U	3.9	U	4.1	U	3.8	U	4.2	U
CYANIDE (mg/kg)																									
CYANIDE	NE	22.0	46.9	0.068	U	0.075	U	0.068	U	0.07	U	0.08	U	0.07	U	0.071	U	0.067	U	0.072	U	0.069	U	0.074	U
TRITIUM (pCi/g)																									
TRITIUM	NE	NE	NE	5.4	U	5.37	U	5.42	U	5.42	U	5.04	U	5.2	U	4.75	U	4.79	U	5.52	U	4.85	U	5.43	U

Risk Additivity
Soil Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number
			Sample Date
			Location
			Depth (ft bgs)
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**
PERCENT SOLIDS	NE	NE	NE
VOLATILES (mg/kg)			
1,1,1-TRICHLOROETHANE	NE	8700	15600
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100
1,1,2-TRICHLOROETHANE	NE	1.1	2.81
1,1-DICHLOROETHANE	NE	3.3	64.5
1,1-DICHLOROETHENE	NE	240	449
1,2,4-TRICHLOROBENZENE	NE	22	73.0
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86
1,2-DIBROMOETHANE	NE	0.034	0.588
1,2-DICHLOROBENZENE	NE	1900	2310
1,2-DICHLOROETHANE	NE	0.43	7.89
1,2-DICHLOROPROPANE	NE	0.94	15.2
1,3-DICHLOROBENZENE	NE	NE	NE
1,4-DICHLOROBENZENE	NE	2.4	31.7
2-HEXANONE	NE	210	NE
ACETONE	NE	61000	66600
BENZENE	NE	1.1	15.4
BROMODICHLOROMETHANE	NE	0.27	5.41
BROMOFORM	NE	62	616
BROMOMETHANE	NE	7.3	16.5
CARBON DISULFIDE	NE	820	1530
CARBON TETRACHLORIDE	NE	0.61	10.8
CHLOROBENZENE	NE	290	376
CHLOROETHANE	NE	15000	29800
CHLOROFORM	NE	0.29	5.86
CHLOROMETHANE	NE	120	275
CIS-1,2-DICHLOROETHYLENE	NE	160	156
CIS-1,3-DICHLOROPROPENE	NE	NE	NE
CYCLOHEXANE	NE	7000	NE
DIBROMOCHLOROMETHANE	NE	0.68	12.1
DICHLORODIFLUOROMETHANE	NE	94	168
ETHYLBENZENE	NE	5.4	68.4
ISOPROPYLBENZENE	NE	2100	2430
METHYL ACETATE	NE	78000	78200
METHYL ETHYL KETONE	NE	28000	37100
METHYL ISOBUTYL KETONE	NE	5300	5820
METHYLCYCLOHEXANE	NE	5630	5630
METHYLENE CHLORIDE	NE	56	409

Risk Additivity Evaluation at Building 920, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
PERCENT SOLIDS				
VOLATILES (mg/kg)				
1,1,1-TRICHLOROETHANE		ND		
1,1,2,2-TETRACHLOROETHANE		ND		
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND		
1,1,2-TRICHLOROETHANE		ND		
1,1-DICHLOROETHANE		ND		
1,1-DICHLOROETHENE		ND		
1,2,4-TRICHLOROBENZENE		ND		
1,2-DIBROMO-3-CHLOROPROPANE		ND		
1,2-DIBROMOETHANE		ND		
1,2-DICHLOROBENZENE		ND		
1,2-DICHLOROETHANE		ND		
1,2-DICHLOROPROPANE		ND		
1,3-DICHLOROBENZENE		ND		
1,4-DICHLOROBENZENE		ND		
2-HEXANONE		ND		
ACETONE		ND		
BENZENE		ND		
BROMODICHLOROMETHANE		ND		
BROMOFORM		ND		
BROMOMETHANE		ND		
CARBON DISULFIDE		ND		
CARBON TETRACHLORIDE		ND		
CHLOROBENZENE		ND		
CHLOROETHANE		ND		
CHLOROFORM		ND		
CHLOROMETHANE		ND		
CIS-1,2-DICHLOROETHYLENE		ND		
CIS-1,3-DICHLOROPROPENE		ND		
CYCLOHEXANE		ND		
DIBROMOCHLOROMETHANE		ND		
DICHLORODIFLUOROMETHANE		ND		
ETHYLBENZENE		ND		
ISOPROPYLBENZENE		ND		
METHYL ACETATE		ND		
METHYL ETHYL KETONE		ND		
METHYL ISOBUTYL KETONE		ND		
METHYLCYCLOHEXANE		ND		
METHYLENE CHLORIDE		ND		

Risk Additivity
Soil Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	Sample Date	Location	Depth (ft bgs)
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]			
VOLATILES - continued (mg/kg)						
STYRENE	NE	6300	7280			
TERT-BUTYL METHYL ETHER	NE	43	901			
TETRACHLOROETHYLENE	NE	22	7.02			
TOLUENE	NE	5000	5270			
TRANS-1,2-DICHLOROETHENE	NE	150	270			
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE			
TRICHLOROETHYLENE	NE	0.91	8.77			
TRICHLOROFLUOROMETHANE	NE	790	1410			
VINYL CHLORIDE	NE	0.06	0.728			
XYLENES, TOTAL	NE	630	814			
SEMIVOLATILES (mg/kg)						
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE			
2,4,5-TRICHLOROPHENOL	NE	6100	6110			
2,4,6-TRICHLOROPHENOL	NE	44	61.1			
2,4-DICHLOROPHENOL	NE	180	183			
2,4-DIMETHYLPHENOL	NE	1200	1220			
2,4-DINITROPHENOL	NE	120	122			
2,4-DINITROTOLUENE	NE	1.6	15.7			
2,6-DINITROTOLUENE	NE	61	61.1			
2-CHLORONAPHTHALENE	NE	6300	6260			
2-CHLOROPHENOL	NE	390	391			
2-METHYLNAPHTHALENE	NE	230	NE			
2-METHYLPHENOL	NE	3100	NE			
2-NITROANILINE	NE	610	NE			
2-NITROPHENOL	NE	NE	NE			
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8			
3-NITROANILINE	NE	NE	NE			
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89			
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE			
4-CHLORO-3-METHYLPHENOL	NE	6100	NE			
4-CHLOROANILINE	NE	2.4	NE			
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE			
4-NITROANILINE	NE	24	NE			
4-NITROPHENOL	NE	NE	NE			
ACENAPHTHENE	NE	3400	3440			
ACENAPHTHYLENE	NE	NE	NE			
ACETOPHENONE	NE	7800	7820			
ANTHRACENE	NE	17000	17200			
ATRAZINE	NE	2.1	NE			

Risk Additivity Evaluation at Building 920, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio	
VOLATILES - continued (mg/kg)					
STYRENE		ND			
TERT-BUTYL METHYL ETHER		ND			
TETRACHLOROETHYLENE		ND			
TOLUENE		ND			
TRANS-1,2-DICHLOROETHENE		ND			
TRANS-1,3-DICHLOROPROPENE		ND			
TRICHLOROETHYLENE		ND			
TRICHLOROFLUOROMETHANE		ND			
VINYL CHLORIDE		ND			
XYLENES, TOTAL		ND			
SEMIVOLATILES (mg/kg)					
2,2'-OXYBIS(1-CHLORO)PROPANE		ND			
2,4,5-TRICHLOROPHENOL		ND			
2,4,6-TRICHLOROPHENOL		ND			
2,4-DICHLOROPHENOL		ND			
2,4-DIMETHYLPHENOL		ND			
2,4-DINITROPHENOL		ND			
2,4-DINITROTOLUENE		ND			
2,6-DINITROTOLUENE		ND			
2-CHLORONAPHTHALENE		ND			
2-CHLOROPHENOL		ND			
2-METHYLNAPHTHALENE	N	0.0814	0.00035	RSL	
2-METHYLPHENOL		ND			
2-NITROANILINE		ND			
2-NITROPHENOL		ND			
3,3'-DICHLOROBENZIDINE		ND			
3-NITROANILINE		ND			
4,6-DINITRO-2-METHYLPHENOL		ND			
4-BROMOPHENYL PHENYL ETHER		ND			
4-CHLORO-3-METHYLPHENOL		ND			
4-CHLOROANILINE		ND			
4-CHLOROPHENYL PHENYL ETHER		ND			
4-NITROANILINE		ND			
4-NITROPHENOL		ND			
ACENAPHTHENE		ND			
ACENAPHTHYLENE		ND			
ACETOPHENONE		ND			
ANTHRACENE		ND			
ATRAZINE		ND			

Risk Additivity
Soil Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	Sample Date	Location	Depth (ft bgs)
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]			
SEMIVOLATILES - continued (mg/kg)						
BENZALDEHYDE	NE	7800	NE			
BENZO(A)ANTHRACENE	NE	0.15	1.48			
BENZO(A)PYRENE	NE	0.015	0.148			
BENZO(B)FLUORANTHENE	NE	0.15	1.48			
BENZO(G,H,I)PERYLENE	NE	NE	NE			
BENZO(K)FLUORANTHENE	NE	1.5	14.8			
BENZYL BUTYL PHTHALATE	NE	260	NE			
BIPHENYL	NE	51	57.1			
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE			
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68			
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347			
CAPROLACTAM	NE	31000	NE			
CARBAZOLE	NE	NE	NE			
CHRYSENE	NE	15	148			
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148			
DIBENZOFURAN	NE	78	NE			
DIETHYL PHTHALATE	NE	49000	48900			
DIMETHYL PHTHALATE	NE	611000	611000			
DI-N-BUTYL PHTHALATE	NE	6100	6110			
DI-N-OCTYLPHTHALATE	NE	730	NE			
FLUORANTHENE	NE	2300	2290			
FLUORENE	NE	2300	2290			
HEXACHLOROBENZENE	NE	0.3	3.04			
HEXACHLOROBUTADIENE	NE	6.2	61.1			
HEXACHLOROCYCLOPENTADIENE	NE	370	367			
HEXACHLOROETHANE	NE	12	42.8			
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48			
ISOPHORONE	NE	510	5120			
M,P-CRESOL	NE	NE	NE			
NAPHTHALENE	NE	3.6	43.0			
NITROBENZENE	NE	4.8	53.5			
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE			
N-NITROSODIPHENYLAMINE	NE	99	993			
PENTACHLOROPHENOL	NE	0.89	8.94			
PHENANTHRENE	NE	1830	1830			
PHENOL	NE	18000	18300			
PYRENE	NE	1700	1720			

Risk Additivity Evaluation at Building 920, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio	
SEMIVOLATILES - continued (mg/kg)					
BENZALDEHYDE		ND			
BENZO(A)ANTHRACENE		ND			
BENZO(A)PYRENE		ND			
BENZO(B)FLUORANTHENE		ND			
BENZO(G,H,I)PERYLENE		ND			
BENZO(K)FLUORANTHENE		ND			
BENZYL BUTYL PHTHALATE		ND			
BIPHENYL		ND			
BIS(2-CHLOROETHOXY) METHANE		ND			
BIS(2-CHLOROETHYL) ETHER		ND			
BIS(2-ETHYLHEXYL) PHTHALATE		ND			
CAPROLACTAM	N	0.0687		0.0000022	RSL
CARBAZOLE		ND			
CHRYSENE		ND			
DIBENZ(A,H)ANTHRACENE		ND			
DIBENZOFURAN		ND			
DIETHYL PHTHALATE		ND			
DIMETHYL PHTHALATE		ND			
DI-N-BUTYL PHTHALATE		ND			
DI-N-OCTYLPHTHALATE		ND			
FLUORANTHENE		ND			
FLUORENE		ND			
HEXACHLOROBENZENE		ND			
HEXACHLOROBUTADIENE		ND			
HEXACHLOROCYCLOPENTADIENE		ND			
HEXACHLOROETHANE		ND			
INDENO(1,2,3-C,D)PYRENE		ND			
ISOPHORONE		ND			
M,P-CRESOL		ND			
NAPHTHALENE	C	0.0318	7.40E-09		
NITROBENZENE		ND			
N-NITROSODI-N-PROPYLAMINE		ND			
N-NITROSODIPHENYLAMINE		ND			
PENTACHLOROPHENOL		ND			
PHENANTHRENE		ND			
PHENOL		ND			
PYRENE		ND			

Risk Additivity
Soil Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	Sample Date	Location	Depth (ft bgs)
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]			
EXPLOSIVES (mg/kg)						
1,3,5-TRINITROBENZENE	NE	2200.0	NE			
1,3-DINITROBENZENE	NE	6.10	NE			
2,4,6-TRINITROTOLUENE	NE	19.0	39.1			
2,4-DINITROTOLUENE	NE	1.60	15.7			
2,6-DINITROTOLUENE	NE	61.0	61.1			
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE			
2-NITROTOLUENE	NE	2.90	29.1			
3-NITROTOLUENE	NE	6.10	7.82			
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE			
4-NITROTOLUENE	NE	30.0	244.4			
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2			
NITROBENZENE	NE	4.80	53.5			
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7			
TETRYL	NE	240.0	244.0			
METALS (mg/kg)						
ALUMINUM	13722	77000	78000			
ANTIMONY	1.6	31	31.3			
ARSENIC	3.7	0.39	3.90			
BARIUM	169	15000	15600			
BERYLLIUM	1.6	160	156			
CADMIUM	0.3	70	70.3			
CALCIUM	317332	NE	NE			
CHROMIUM[d]	25	117000	117000			
COBALT	7.7	23	NE			
COPPER	13	3100	3130			
IRON	23049	55000	54800			
LEAD	10.9	400	400			
MAGNESIUM	16991	NE	NE			
MANGANESE	393	1800	1860			
MERCURY	0.0108	10	15.6			
NICKEL	17.4	1500	1560			
POTASSIUM	5077	NE	NE			
SELENIUM	1.4	390	391			
SILVER	1.1	390	391			
SODIUM	5196	NE	NE			
THALLIUM	1.3	0.78	0.782			
VANADIUM	42.6	390	391			
ZINC	54.6	23000	23500			

Risk Additivity Evaluation at Building 920, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio	
EXPLOSIVES (mg/kg)					
1,3,5-TRINITROBENZENE		ND			
1,3-DINITROBENZENE		ND			
2,4,6-TRINITROTOLUENE		ND			
2,4-DINITROTOLUENE		ND			
2,6-DINITROTOLUENE		ND			
2-AMINO-4,6-DINITROTOLUENE		ND			
2-NITROTOLUENE		ND			
3-NITROTOLUENE		ND			
4-AMINO-2,6-DINITROTOLUENE		ND			
4-NITROTOLUENE		ND			
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE		ND			
NITROBENZENE		ND			
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE		ND			
TETRYL		ND			
METALS (mg/kg)					
ALUMINUM	N	5740		0.074	
ANTIMONY		ND			
ARSENIC	C	1.5	3.85E-06		
BARIUM	N	66.2		0.0042	
BERYLLIUM	N	ND			
CADMIUM		ND			
CALCIUM		224000		nutrient	
CHROMIUMd	N	5.1		0.000044	
COBALT	N	2		0.087	RSL
COPPER	N	4.7		0.0015	
IRON	N	4830		0.088	
LEAD	N	2.3		0.0058	
MAGNESIUM		6810		nutrient	
MANGANESE	N	121		0.065	
MERCURY	N	ND			
NICKEL	N	4.1		0.0026	
POTASSIUM		1820		nutrient	
SELENIUM		ND			
SILVER		ND			
SODIUM		3530		nutrient	
THALLIUM		ND			
VANADIUM	N	12.1		0.031	
ZINC	N	14.2		0.00060	

Risk Additivity
Soil Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	
			Sample Date	
			Location	
			Depth (ft bgs)	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	
PCBs (mg/kg)				
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	
PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	
OIL RANGE ORGANICS C28-C40	NE	NE	1000	
CYANIDE (mg/kg)				
CYANIDE	NE	22.0	46.9	
TRITIUM (pCi/g)				
TRITIUM	NE	NE	NE	

Risk Additivity Evaluation at Building 920, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
PCBs (mg/kg)				
PCB-1016 (AROCLOR 1016)		ND		
PCB-1221 (AROCLOR 1221)		ND		
PCB-1232 (AROCLOR 1232)		ND		
PCB-1242 (AROCLOR 1242)		ND		
PCB-1248 (AROCLOR 1248)		ND		
PCB-1254 (AROCLOR 1254)		ND		
PCB-1260 (AROCLOR 1260)		ND		
PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10		ND		
DIESEL RANGE ORGANICS C10-C28		ND		
OIL RANGE ORGANICS C28-C40		ND		
CYANIDE (mg/kg)				
CYANIDE		ND		
TRITIUM (pCi/g)				
TRITIUM		ND		
		SUM =	***3.9E-06***	***0.36***

Risk Additivity
Soil Analytical Data
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, February, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
EPA = U.S. Environmental Protection Agency
FD = field duplicate
ft bgs = feet below ground surface
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Risk Additivity
Soil Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531B-IS-0001-071112		OTC531B-IS-0002-071112		OTC531B-IS-0003-071112		OTC531B-IS-0004-071112-FD		OTC531B-IS-0005-071112		OTC531B-IS-0006-071112		OTC531B-IS-0007-071112		OTC531B-IS-0008-071112		OTC531B-IS-0009-071112		OTC531B-IS-0010-071112		OTC531B-IS-0011-071112	
			Sample Date	7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012	
			Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE	**77.1**		**71.6**		**82.6**				**75.3**		**85.2**		**72.7**		**87.2**		**74.7**		**88.1**		**72.9**	
VOLATILES (mg/kg)																									
1,1,1-TRICHLOROETHANE	NE	8700	15600	0.0013	U	0.0011	U	0.0011	U	0.0011	U	0.001	U	0.0013	U	0.001	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02	0.0014	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0014	U	0.0011	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100	0.002	U	0.0017	U	0.0017	U	0.0017	U	0.0016	U	0.002	U	0.0016	U	0.0019	U	0.0016	U	0.0017	U	0.0016	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81	0.0013	U	0.0011	U	0.0011	U	0.0011	U	0.001	U	0.0013	U	0.001	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
1,1-DICHLOROETHANE	NE	3.3	64.5	0.0013	U	0.0011	U	0.0011	U	0.0011	U	0.001	U	0.0013	U	0.001	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
1,1-DICHLOROETHENE	NE	240	449	0.0016	U	0.0014	U	0.0014	U	0.0014	U	0.0013	U	0.0017	U	0.0013	U	0.0015	U	0.0013	U	0.0014	U	0.0014	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0	0.0014	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0014	U	0.0011	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86	0.0027	U	0.0023	U	0.0023	U	0.0023	U	0.0022	U	0.0027	U	0.0022	U	0.0025	U	0.0021	U	0.0023	U	0.0022	U
1,2-DIBROMOETHANE	NE	0.034	0.588	0.0012	U	0.001	U	0.00099	U	0.001	U	0.00094	U	0.0012	U	0.00095	U	0.0011	U	0.00092	U	0.001	U	0.00096	U
1,2-DICHLOROBENZENE	NE	1900	2310	0.0013	U	0.0011	U	0.0011	U	0.0011	U	0.001	U	0.0013	U	0.001	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
1,2-DICHLOROETHANE	NE	0.43	7.89	0.0012	U	0.001	U	0.00099	U	0.001	U	0.00094	U	0.0012	U	0.00095	U	0.0011	U	0.00092	U	0.001	U	0.00096	U
1,2-DICHLOROPROPANE	NE	0.94	15.2	0.0014	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0014	U	0.0011	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U
1,3-DICHLOROBENZENE	NE	NE	NE	0.0014	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0014	U	0.0011	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U
1,4-DICHLOROBENZENE	NE	2.4	31.7	0.0013	U	0.0011	U	0.0011	U	0.0011	U	0.001	U	0.0013	U	0.001	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
2-HEXANONE	NE	210	NE	0.0063	U	0.0054	U	0.0054	U	0.0055	U	0.0051	U	0.0064	U	0.0051	U	0.0059	U	0.005	U	0.0055	U	0.0052	U
ACETONE	NE	61000	66600	0.023	U	0.02	U	0.02	U	0.02	U	0.019	U	0.024	U	0.019	U	0.022	U	0.018	U	0.02	U	0.019	U
BENZENE	NE	1.1	15.4	0.0018	U	0.0015	U	0.0015	U	0.0015	U	0.0014	U	0.0018	U	0.0014	U	0.0016	U	0.0014	U	0.0015	U	0.0014	U
BROMODICHLOROMETHANE	NE	0.27	5.41	0.0013	U	0.0011	U	0.0011	U	0.0011	U	0.001	U	0.0013	U	0.001	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
BROMOFORM	NE	62	616	0.0018	U	0.0015	U	0.0015	U	0.0015	U	0.0014	U	0.0018	U	0.0014	U	0.0016	U	0.0014	U	0.0015	U	0.0014	U
BROMOMETHANE	NE	7.3	16.5	0.0023	U	0.002	U	0.002	U	0.002	U	0.0019	U	0.0024	U	0.0019	U	0.0022	U	0.0018	U	0.002	U	0.0019	U
CARBON DISULFIDE	NE	820	1530	0.0023	U	0.002	U	0.002	U	0.002	U	0.0019	U	0.0024	U	0.0019	U	0.0022	U	0.0018	U	0.002	U	0.0019	U
CARBON TETRACHLORIDE	NE	0.61	10.8	0.0021	U	0.0018	U	0.0018	U	0.0018	U	0.0017	U	0.0021	U	0.0017	U	0.002	U	0.0017	U	0.0018	U	0.0017	U
CHLOROBENZENE	NE	290	376	0.0012	U	0.001	U	0.00099	U	0.001	U	0.00094	U	0.0012	U	0.00095	U	0.0011	U	0.00092	U	0.001	U	0.00096	U
CHLOROETHANE	NE	15000	29800	0.0023	U	0.002	U	0.002	U	0.002	U	0.0019	U	0.0024	U	0.0019	U	0.0022	U	0.0018	U	0.002	U	0.0019	U
CHLOROFORM	NE	0.29	5.86	0.0014	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0014	U	0.0011	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U
CHLOROMETHANE	NE	120	275	0.0023	UJ	0.002	UJ	0.002	UJ	0.002	UJ	0.0019	UJ	0.0024	UJ	0.0019	UJ	0.0022	UJ	0.0018	UJ	0.002	UJ	0.0019	UJ
CIS-1,2-DICHLOROETHYLENE	NE	160	156	0.0018	U	0.0015	U	0.0015	U	0.0015	U	0.0014	U	0.0018	U	0.0014	U	0.0016	U	0.0014	U	0.0015	U	0.0014	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	0.0012	U	0.001	U	0.00099	U	0.001	U	0.00094	U	0.0012	U	0.00095	U	0.0011	U	0.00092	U	0.001	U	0.00096	U
CYCLOHEXANE	NE	7000	NE	0.0018	UJ	0.0019	UJ	0.0017	UJ	0.0016	UJ	0.0018	UJ	0.0016	UJ	0.0018	UJ	0.0015	UJ	0.0018	UJ	0.0016	UJ	0.0019	UJ
DIBROMOCHLOROMETHANE	NE	0.68	12.1	0.0012	U	0.001	U	0.00099	U	0.001	U	0.00094	U	0.0012	U	0.00095	U	0.0011	U	0.00092	U	0.001	U	0.00096	U
DICHLORODIFLUOROMETHANE	NE	94	168	0.0018	UJ	0.0015	UJ	0.0015	UJ	0.0015	UJ	0.0014	UJ	0.0018	UJ	0.0014	UJ	0.0016	UJ	0.0014	UJ	0.0015	UJ	0.0014	UJ
ETHYLBENZENE	NE	5.4	68.4	0.0012	U	0.001	U	0.00099	U	0.001	U	0.00094	U	0.0012	U	0.00095	U	0.0011	U	0.00092	U	0.001	U	0.00096	U
ISOPROPYLBENZENE	NE	2100	2430	0.0013	U	0.0011	U	0.0011	U	0.0011	U	0.001	U	0.0013	U	0.001	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
METHYL ACETATE	NE	78000	78200	0.015	U	0.013	U	0.012	U	0.013	U	0.012	U	0.015	U	0.012	U	0.014	U	0.011	U	0.013	U	0.012	U
METHYL ETHYL KETONE	NE	28000	37100	0.0071	U	0.0061	U	0.0061	U	0.0062	U	0.0057	U	0.0072	U	0.0058	U	0.0067	U	0.0056	U	0.0062	U	0.0059	U
METHYL ISOBUTYL KETONE	NE	5300	5820	0.0064	U	0.0055	U	**0.0058**	J	0.0056	U	0.0052	U	0.0065	U	0.0052	U	0.006	U	**0.0062**	J	0.0056	U	**0.0063**	J
METHYLCYCLOHEXANE	NE	5630	5630	0.0016	UJ	0.0018	UJ	0.0016	UJ	0.0015	UJ	0.0017	UJ	0.0015	UJ	0.0017	UJ	0.0014	UJ	**0.0018**		**0.0017**		0.0013	U
METHYLENE CHLORIDE	NE	56	409	0.0054	U	0.0046	U	0.0046	U	0.0047	U	0.0043	U	0.0055	U	0.0044	U	0.005	U	0.0042	U	0.0047	U	0.0044	U

Risk Additivity
Soil Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC531B-IS-0001-071112		OTC531B-IS-0002-071112		OTC531B-IS-0003-071112		OTC531B-IS-0004-071112-FD		OTC531B-IS-0005-071112		OTC531B-IS-0006-071112		OTC531B-IS-0007-071112		OTC531B-IS-0008-071112		OTC531B-IS-0009-071112		OTC531B-IS-0010-071112		OTC531B-IS-0011-071112	
				Sample Date	7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																										
STYRENE	NE	6300	7280	0.003	U	0.0026	U	0.0026	U	0.0026	U	0.0024	U	0.0031	U	0.0025	U	0.0028	U	0.0024	U	0.0027	U	0.0025	U
TERT-BUTYL METHYL ETHER	NE	43	901	0.0023	U	0.002	U	0.002	U	0.002	U	0.0019	U	0.0024	U	0.0019	U	0.0022	U	0.0018	U	0.002	U	0.0019	U
TETRACHLOROETHYLENE	NE	22	7.02	0.0012	U	0.001	U	0.00099	U	0.001	U	0.00094	U	0.0012	U	0.00095	U	0.0011	U	0.00092	U	0.001	U	0.00096	U
TOLUENE	NE	5000	5270	0.0014	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0014	U	0.0011	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U
TRANS-1,2-DICHLOROETHENE	NE	150	270	0.0018	U	0.0015	U	0.0015	U	0.0015	U	0.0014	U	0.0018	U	0.0014	U	0.0016	U	0.0014	U	0.0015	U	0.0014	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.0013	U	0.0011	U	0.0011	U	0.0011	U	0.001	U	0.0013	U	0.001	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
TRICHLOROETHYLENE	NE	0.91	8.77	0.0014	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0014	U	0.0011	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U
TRICHLOROFLUOROMETHANE	NE	790	1410	0.0023	U	0.002	U	0.002	U	0.002	U	0.0019	U	0.0024	U	0.0019	U	0.0022	U	0.0018	U	0.002	U	0.0019	U
VINYL CHLORIDE	NE	0.06	0.728	0.0018	U	0.0015	U	0.0015	U	0.0015	U	0.0014	U	0.0018	U	0.0014	U	0.0016	U	0.0014	U	0.0015	U	0.0014	U
XYLENES, TOTAL	NE	630	814	0.0037	U	0.0032	U	0.0032	U	0.0032	U	0.003	U	0.0038	U	0.003	U	0.0035	U	0.0029	U	0.0033	U	0.0031	U
SEMIVOLATILES (mg/kg)																										
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	0.21	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.22	U	0.019	U	0.023	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
2,4-DICHLOROPHENOL	NE	180	183	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
2,4-DIMETHYLPHENOL	NE	1200	1220	0.027	U	0.03	U	0.025	U	0.025	U	0.028	U	0.024	U	0.029	U	0.024	U	0.028	U	0.024	U	0.028	U
2,4-DINITROPHENOL	NE	120	122	0.42	U	0.47	U	0.4	U	0.39	U	0.44	U	0.38	U	0.46	U	0.38	U	0.44	UJ	0.38	U	0.45	U
2,4-DINITROTOLUENE	NE	1.6	15.7	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
2,6-DINITROTOLUENE	NE	61	61.1	0.025	U	0.028	U	0.023	U	0.023	U	0.026	U	0.023	U	0.027	U	0.023	U	0.026	U	0.022	U	0.027	U
2-CHLORONAPHTHALENE	NE	6300	6260	0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
2-CHLOROPHENOL	NE	390	391	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
2-METHYLNAPHTHALENE	NE	230	NE	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
2-METHYLPHENOL	NE	3100	NE	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
2-NITROANILINE	NE	610	NE	0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
2-NITROPHENOL	NE	NE	NE	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
3-NITROANILINE	NE	NE	NE	0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	0.085	U	0.094	U	0.08	U	0.078	U	0.088	U	0.077	U	0.092	U	0.077	U	0.088	U	0.075	U	0.09	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
4-CHLOROANILINE	NE	2.4	NE	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
4-NITROANILINE	NE	24	NE	0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
4-NITROPHENOL	NE	NE	NE	0.17	U	0.19	U	0.16	U	0.16	U	0.18	U	0.15	U	0.18	U	0.15	U	0.18	U	0.15	U	0.18	U
ACENAPHTHENE	NE	3400	3440	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
ACENAPHTHYLENE	NE	NE	NE	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
ACETOPHENONE	NE	7800	7820	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
ANTHRACENE	NE	17000	17200	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
ATRAZINE	NE	2.1	NE	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U

Risk Additivity
Soil Analytical Data
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Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531B-IS-0001-071112		OTC531B-IS-0002-071112		OTC531B-IS-0003-071112		OTC531B-IS-0004-071112-FD		OTC531B-IS-0005-071112		OTC531B-IS-0006-071112		OTC531B-IS-0007-071112		OTC531B-IS-0008-071112		OTC531B-IS-0009-071112		OTC531B-IS-0010-071112		OTC531B-IS-0011-071112	
			Sample Date	7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012	
			Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																									
BENZALDEHYDE	NE	7800	NE	0.21	U	0.24	U	0.2	U	0.2	U	0.22	U	0.19	U	0.23	U	0.19	U	0.22	U	0.19	U	0.23	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
BENZO(A)PYRENE	NE	0.015	0.148	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
BIPHENYL	NE	51	57.1	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.085	U	0.094	U	0.08	U	0.078	U	0.088	U	0.077	U	0.092	U	0.077	U	0.088	U	0.075	U	0.09	U
CAPROLACTAM	NE	31000	NE	0.068	U	0.075	U	0.064	U	0.063	U	0.071	U	0.062	U	0.073	U	0.062	U	0.071	UJ	0.06	U	0.072	U
CARBAZOLE	NE	NE	NE	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
CHRYSENE	NE	15	148	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
DIBENZOFURAN	NE	78	NE	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
DIETHYL PHTHALATE	NE	49000	48900	0.085	U	0.094	U	0.08	U	0.078	U	0.088	U	0.077	U	0.092	U	0.077	U	0.088	U	0.075	U	0.09	U
DIMETHYL PHTHALATE	NE	611000	611000	0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.085	U	0.094	U	0.08	U	0.078	U	0.088	U	0.077	U	0.092	U	0.077	U	0.088	U	0.075	U	0.09	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
FLUORANTHENE	NE	2300	2290	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
FLUORENE	NE	2300	2290	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.093	U	0.1	U	0.088	U	0.086	U	0.097	U	0.085	U	0.1	U	0.085	U	0.097	U	0.083	U	0.099	U
HEXACHLOROETHANE	NE	12	42.8	0.042	U	0.047	U	0.04	U	0.039	U	0.044	U	0.038	U	0.046	U	0.038	U	0.044	U	0.038	U	0.045	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
ISOPHORONE	NE	510	5120	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	UJ	0.019	U	0.023	U
M,P-CRESOL	NE	NE	NE	0.031	U	0.034	U	0.029	U	0.028	U	0.032	U	0.028	U	0.033	U	0.028	U	0.032	U	0.027	U	0.032	U
NAPHTHALENE	NE	3.6	43.0	0.034	U	0.038	U	0.032	U	0.031	U	0.035	U	0.031	U	0.037	U	0.031	U	0.035	U	0.03	U	0.036	U
NITROBENZENE	NE	4.8	53.5	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.25	U	0.28	U	0.24	U	0.23	U	0.26	U	0.23	U	0.28	U	0.23	U	0.27	U	0.23	U	0.27	U
PHENANTHRENE	NE	1830	1830	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
PHENOL	NE	18000	18300	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U
PYRENE	NE	1700	1720	0.021	U	0.024	U	0.02	U	0.02	U	0.022	U	0.019	U	0.023	U	0.019	U	0.022	U	0.019	U	0.023	U

Risk Additivity
Soil Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC531B-IS-0001-071112		OTC531B-IS-0002-071112		OTC531B-IS-0003-071112		OTC531B-IS-0004-071112-FD		OTC531B-IS-0005-071112		OTC531B-IS-0006-071112		OTC531B-IS-0007-071112		OTC531B-IS-0008-071112		OTC531B-IS-0009-071112		OTC531B-IS-0010-071112		OTC531B-IS-0011-071112	
				Sample Date		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012	
				Location		Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
				Depth (ft bgs)		3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																											
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
1,3-DINITROBENZENE	NE	6.10	NE	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
2,4-DINITROTOLUENE	NE	1.60	15.7	0.078	U	0.09	U	0.084	U	0.079	U	0.089	U	0.087	U	0.088	U	0.08	U	0.089	U	0.089	U	0.078	U
2,6-DINITROTOLUENE	NE	61.0	61.1	0.07	U	0.081	U	0.076	U	0.071	U	0.079	U	0.078	U	0.079	U	0.072	U	0.079	U	0.079	U	0.07	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
2-NITROTOLUENE	NE	2.90	29.1	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
3-NITROTOLUENE	NE	6.10	7.82	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
4-NITROTOLUENE	NE	30.0	244.4	0.081	U	0.094	U	0.088	U	0.082	U	0.092	U	0.091	U	0.092	U	0.083	U	0.092	U	0.092	U	0.081	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
NITROBENZENE	NE	4.80	53.5	0.074	U	0.087	U	0.081	U	0.076	U	0.085	U	0.084	U	0.085	U	0.077	U	0.085	U	0.085	U	0.074	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
TETRYL	NE	240.0	244.0	0.064	U	0.074	U	0.07	U	0.065	U	0.073	U	0.072	U	0.073	U	0.066	U	0.073	U	0.073	U	0.064	U
METALS (mg/kg)																											
ALUMINUM	13722	77000	78000	**2070**		**1830**		**5210**		**3500**		**2290**		**18000**		**5280**		**13800**		**1670**		**16900**		**1720**			
ANTIMONY	1.6	31	31.3	1.1	U	1.2	U	0.95	U	1.2	U	1	U	1	U	1.1	U	0.79	U	1.2	U	0.88	U	1.4	UJ
ARSENIC	3.7	0.39	3.90	1.1	U	1.2	U	**1.8**	J	1.2	U	1	U	**3.6**	J	**1.4**	J	**3.2**	J	1.2	U	**3.1**	J	1.4	U
BARIUM	169	15000	15600	**29.1**	J	**14.7**	J	**57.6**	J	**38.4**	J	**19.6**	J	**118**		**53.8**	J	**67.8**	J	**19.3**	J	**103**		**16.9**	J
BERYLLIUM	1.6	160	156	0.54	U	0.62	U	0.47	U	0.58	U	0.52	U	**0.74**	J	0.53	U	**0.6**	J	0.6	U	**0.73**	J	0.68	U
CADMIUM	0.3	70	70.3	0.54	U	0.62	U	0.47	U	0.58	U	0.52	U	0.51	U	0.53	U	0.39	U	0.6	U	0.44	U	0.68	U
CALCIUM	317332	NE	NE	**241000**		**225000**		**132000**		**167000**		**197000**		**87800**		**163000**		**73000**		**180000**		**78900**		**228000**			
CHROMIUM[d]	25	117000	117000	**1.7**	J	**2**	J	**4.7**		**3.3**	J	**2.6**	J	**15.9**		**5.6**		**12.4**		**1.5**	J	**14.6**		**1.7**	J
COBALT	7.7	23	NE	**0.9**	J	0.62	U	**2.1**	J	**1.1**	J	**0.63**	J	**5.5**	J	**1.8**	J	**4.6**	J	**0.78**	J	**5.4**	J	0.68	U
COPPER	13	3100	3130	**2.3**	J	**2.3**	J	**3.4**	J	**2.2**	J	**1.5**	J	**13.6**		**3.8**	J	**10.2**		1.2	U	**13.1**		1.4	U
IRON	23049	55000	54800	**1620**		**1740**		**4810**		**3200**		**2170**		**15500**		**4870**		**12600**		**1560**		**14700**		**1570**			
LEAD	10.9	400	400	**1.4**	J	**1.2**	J	**2.9**	J	**1.7**	J	**0.76**	J	**9**	J	**2.8**	J	**7.5**	J	**0.81**	J	**9.1**		0.68	U
MAGNESIUM	16991	NE	NE	**3270**		**1680**	J	**2580**		**1870**	J	**1950**	J	**9510**		**3210**		**5250**		**1030**	J	**12200**		**1280**	J
MANGANESE	393	1800	1860	**34.7**		**26.7**		**82**		**59.7**		**37.2**		**387**		**98.5**		**292**		**15**		**400**		**39.6**	J
MERCURY	0.0108	10	15.6	0.01	U	0.011	U	0.0092	U	0.0094	U	0.011	U	0.0093	U	**0.012**	J	**0.014**	J	0.01	U	**0.01**	J	0.01	U
NICKEL	17.4	1500	1560	**1.4**	J	**1.1**	J	**4.5**	J	**2.7**	J	**1.3**	J	**12.3**	J	**3.6**	J	**9.9**	J	**0.83**	J	**12.4**	J	**1.3**	J
POTASSIUM	5077	NE	NE	**684**	J	**587**	J	**1310**	J	**944**	J	**691**	J	**5320**		**1530**	J	**3920**		**501**	J	**5550**		**460**	J
SELENIUM	1.4	390	391	2.2	U	2.5	U	1.9	U	2.3	U	2.1	U	2.1	U	2.1	U	1.6	U	2.4	U	1.8	U	2.7	U
SILVER	1.1	390	391	0.54	U	0.62	U	0.47	U	0.58	U	0.52	U	0.51	U	0.53	U	0.39	U	0.6	U	0.44	U	0.68	U
SODIUM	5196	NE	NE	**941**	J	**1890**	J	**1110**	J	**850**	J	**2230**	J	**2610**	J	**1680**	J	**1440**	J	**832**	J	**2600**	J	**1210**	J
THALLIUM	1.3	0.78	0.782	1.4	U	1.6	U	1.2	U	1.5	U	1.3	U	1.3	U	1.4	U	1	U	1.6	U	1.1	U	1.8	U
VANADIUM	42.6	390	391	**4.1**	J	**3.3**	J	**11**	J	**7.1**	J	**5**	J	**24.9**	J	**9.3**	J	**20.6**		**2.8**	J	**22.7**		**3**	J
ZINC	54.6	23000	23500	**4.7**	J	**4.6**	J	**14**		**8.6**	J	**5.4**	J	**51.3**		**14**		**38.6**		**3.1**	J	**50**		**3.9**	J

Risk Additivity
Soil Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC531B-IS-0001-071112		OTC531B-IS-0002-071112		OTC531B-IS-0003-071112		OTC531B-IS-0004-071112-FD		OTC531B-IS-0005-071112		OTC531B-IS-0006-071112		OTC531B-IS-0007-071112		OTC531B-IS-0008-071112		OTC531B-IS-0009-071112		OTC531B-IS-0010-071112		OTC531B-IS-0011-071112	
				Sample Date	7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																										
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93		0.0087	U	0.0092	U	0.0079	U	0.0078	U	0.0088	U	0.0078	U	0.0091	U	0.0075	U	0.0088	U	0.0076	U	0.0091	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49		0.011	U	0.012	U	0.0099	U	0.0097	U	0.011	U	0.0097	U	0.011	U	0.0094	U	0.011	U	0.0095	U	0.011	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49		0.011	U	0.012	U	0.0099	U	0.0097	U	0.011	U	0.0097	U	0.011	U	0.0094	U	0.011	U	0.0095	U	0.011	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22		0.0087	U	0.0092	U	0.0079	U	0.0078	U	0.0088	U	0.0078	U	0.0091	U	0.0075	U	0.0088	U	0.0076	U	0.0091	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22		0.0087	U	0.0092	U	0.0079	U	0.0078	U	0.0088	U	0.0078	U	0.0091	U	0.0075	U	0.0088	U	0.0076	U	0.0091	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12		0.0087	U	0.0092	U	0.0079	U	0.0078	U	0.0088	U	0.0078	U	0.0091	U	0.0075	U	0.0088	U	0.0076	U	0.0091	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22		0.0087	U	0.0092	U	0.0079	U	0.0078	U	0.0088	U	0.0078	U	0.0091	U	0.0075	U	0.0088	U	0.0076	U	0.0091	U
PETROLEUM HYDROCARBONS (mg/kg)																										
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000		4	U	4.4	U	3.6	U	3	U	3.1	U	3.3	U	3.4	U	2.6	U	3.4	U	3.1	U	3.1	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000		4.3	U	4.6	U	4	U	3.9	U	4.4	U	3.9	U	4.5	U	3.8	U	4.4	U	3.7	U	4.6	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000		4.3	U	4.6	U	4	U	3.9	U	4.4	U	3.9	U	4.5	U	3.8	U	4.4	U	3.7	U	4.6	U
CYANIDE (mg/kg)																										
CYANIDE	NE	22.0	46.9		0.075	U	0.082	U	0.07	U	0.068	U	0.08	U	0.07	U	0.081	U	0.066	U	0.08	U	0.067	U	0.081	U
TRITIUM (pCi/g)																										
TRITIUM	NE	NE	NE		5.36	U	5.41	U	5.31	U	5.5	U	5.51	U	5.42	U	5.53	U	5.37	U	5.49	U	5.37	U	5.43	U

Risk Additivity
Soil Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	Risk Additivity Evaluation at Building 921, Holloman AFB					
			Sample Date						
			Location						
			Depth (ft bgs)						
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio	HQ Contribution
PERCENT SOLIDS	NE	NE	NE	PERCENT SOLIDS					
VOLATILES (mg/kg)				VOLATILES (mg/kg)					
1,1,1-TRICHLOROETHANE	NE	8700	15600	1,1,1-TRICHLOROETHANE		ND			
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02	1,1,2,2-TETRACHLOROETHANE		ND			
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND			
1,1,2-TRICHLOROETHANE	NE	1.1	2.81	1,1,2-TRICHLOROETHANE		ND			
1,1-DICHLOROETHANE	NE	3.3	64.5	1,1-DICHLOROETHANE		ND			
1,1-DICHLOROETHENE	NE	240	449	1,1-DICHLOROETHENE		ND			
1,2,4-TRICHLOROBENZENE	NE	22	73.0	1,2,4-TRICHLOROBENZENE		ND			
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86	1,2-DIBROMO-3-CHLOROPROPANE		ND			
1,2-DIBROMOETHANE	NE	0.034	0.588	1,2-DIBROMOETHANE		ND			
1,2-DICHLOROBENZENE	NE	1900	2310	1,2-DICHLOROBENZENE		ND			
1,2-DICHLOROETHANE	NE	0.43	7.89	1,2-DICHLOROETHANE		ND			
1,2-DICHLOROPROPANE	NE	0.94	15.2	1,2-DICHLOROPROPANE		ND			
1,3-DICHLOROBENZENE	NE	NE	NE	1,3-DICHLOROBENZENE		ND			
1,4-DICHLOROBENZENE	NE	2.4	31.7	1,4-DICHLOROBENZENE		ND			
2-HEXANONE	NE	210	NE	2-HEXANONE		ND			
ACETONE	NE	61000	66600	ACETONE		ND			
BENZENE	NE	1.1	15.4	BENZENE		ND			
BROMODICHLOROMETHANE	NE	0.27	5.41	BROMODICHLOROMETHANE		ND			
BROMOFORM	NE	62	616	BROMOFORM		ND			
BROMOMETHANE	NE	7.3	16.5	BROMOMETHANE		ND			
CARBON DISULFIDE	NE	820	1530	CARBON DISULFIDE		ND			
CARBON TETRACHLORIDE	NE	0.61	10.8	CARBON TETRACHLORIDE		ND			
CHLOROBENZENE	NE	290	376	CHLOROBENZENE		ND			
CHLOROETHANE	NE	15000	29800	CHLOROETHANE		ND			
CHLOROFORM	NE	0.29	5.86	CHLOROFORM		ND			
CHLOROMETHANE	NE	120	275	CHLOROMETHANE		ND			
CIS-1,2-DICHLOROETHYLENE	NE	160	156	CIS-1,2-DICHLOROETHYLENE		ND			
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	CIS-1,3-DICHLOROPROPENE		ND			
CYCLOHEXANE	NE	7000	NE	CYCLOHEXANE		ND			
DIBROMOCHLOROMETHANE	NE	0.68	12.1	DIBROMOCHLOROMETHANE		ND			
DICHLORODIFLUOROMETHANE	NE	94	168	DICHLORODIFLUOROMETHANE		ND			
ETHYLBENZENE	NE	5.4	68.4	ETHYLBENZENE		ND			
ISOPROPYLBENZENE	NE	2100	2430	ISOPROPYLBENZENE		ND			
METHYL ACETATE	NE	78000	78200	METHYL ACETATE		ND			
METHYL ETHYL KETONE	NE	28000	37100	METHYL ETHYL KETONE		ND			
METHYL ISOBUTYL KETONE	NE	5300	5820	METHYL ISOBUTYL KETONE	N	0.0058	0.0000011		0.0001%
METHYLCYCLOHEXANE	NE	5630	5630	METHYLCYCLOHEXANE	N	0.0017	0.00000030		0.00003%
METHYLENE CHLORIDE	NE	56	409	METHYLENE CHLORIDE		ND			

Risk Additivity
Soil Analytical Data
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Holloman Air Force Base, New Mexico

Analyte			Sample Number	Risk Additivity Evaluation at Building 921, Holloman AFB					
			Sample Date						
			Location						
			Depth (ft bgs)						
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio	HQ Contribution
VOLATILES - continued (mg/kg)				VOLATILES - continued (mg/kg)					
STYRENE	NE	6300	7280	STYRENE		ND			
TERT-BUTYL METHYL ETHER	NE	43	901	TERT-BUTYL METHYL ETHER		ND			
TETRACHLOROETHYLENE	NE	22	7.02	TETRACHLOROETHYLENE		ND			
TOLUENE	NE	5000	5270	TOLUENE		ND			
TRANS-1,2-DICHLOROETHENE	NE	150	270	TRANS-1,2-DICHLOROETHENE		ND			
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	TRANS-1,3-DICHLOROPROPENE		ND			
TRICHLOROETHYLENE	NE	0.91	8.77	TRICHLOROETHYLENE		ND			
TRICHLOROFLUOROMETHANE	NE	790	1410	TRICHLOROFLUOROMETHANE		ND			
VINYL CHLORIDE	NE	0.06	0.728	VINYL CHLORIDE		ND			
XYLENES, TOTAL	NE	630	814	XYLENES, TOTAL		ND			
SEMIVOLATILES (mg/kg)				SEMIVOLATILES (mg/kg)					
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	2,2'-OXYBIS(1-CHLORO)PROPANE		ND			
2,4,5-TRICHLOROPHENOL	NE	6100	6110	2,4,5-TRICHLOROPHENOL		ND			
2,4,6-TRICHLOROPHENOL	NE	44	61.1	2,4,6-TRICHLOROPHENOL		ND			
2,4-DICHLOROPHENOL	NE	180	183	2,4-DICHLOROPHENOL		ND			
2,4-DIMETHYLPHENOL	NE	1200	1220	2,4-DIMETHYLPHENOL		ND			
2,4-DINITROPHENOL	NE	120	122	2,4-DINITROPHENOL		ND			
2,4-DINITROTOLUENE	NE	1.6	15.7	2,4-DINITROTOLUENE		ND			
2,6-DINITROTOLUENE	NE	61	61.1	2,6-DINITROTOLUENE		ND			
2-CHLORONAPHTHALENE	NE	6300	6260	2-CHLORONAPHTHALENE		ND			
2-CHLOROPHENOL	NE	390	391	2-CHLOROPHENOL		ND			
2-METHYLNAPHTHALENE	NE	230	NE	2-METHYLNAPHTHALENE		ND			
2-METHYLPHENOL	NE	3100	NE	2-METHYLPHENOL		ND			
2-NITROANILINE	NE	610	NE	2-NITROANILINE		ND			
2-NITROPHENOL	NE	NE	NE	2-NITROPHENOL		ND			
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	3,3'-DICHLOROBENZIDINE		ND			
3-NITROANILINE	NE	NE	NE	3-NITROANILINE		ND			
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	4,6-DINITRO-2-METHYLPHENOL		ND			
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	4-BROMOPHENYL PHENYL ETHER		ND			
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	4-CHLORO-3-METHYLPHENOL		ND			
4-CHLOROANILINE	NE	2.4	NE	4-CHLOROANILINE		ND			
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	4-CHLOROPHENYL PHENYL ETHER		ND			
4-NITROANILINE	NE	24	NE	4-NITROANILINE		ND			
4-NITROPHENOL	NE	NE	NE	4-NITROPHENOL		ND			
ACENAPHTHENE	NE	3400	3440	ACENAPHTHENE		ND			
ACENAPHTHYLENE	NE	NE	NE	ACENAPHTHYLENE		ND			
ACETOPHENONE	NE	7800	7820	ACETOPHENONE		ND			
ANTHRACENE	NE	17000	17200	ANTHRACENE		ND			
ATRAZINE	NE	2.1	NE	ATRAZINE		ND			

Risk Additivity
Soil Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	Risk Additivity Evaluation at Building 921, Holloman AFB					
			Sample Date						
			Location						
			Depth (ft bgs)						
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio	HQ Contribution
SEMIVOLATILES - continued (mg/kg)				SEMIVOLATILES - continued (mg/kg)					
BENZALDEHYDE	NE	7800	NE	BENZALDEHYDE		ND			
BENZO(A)ANTHRACENE	NE	0.15	1.48	BENZO(A)ANTHRACENE		ND			
BENZO(A)PYRENE	NE	0.015	0.148	BENZO(A)PYRENE		ND			
BENZO(B)FLUORANTHENE	NE	0.15	1.48	BENZO(B)FLUORANTHENE		ND			
BENZO(G,H,I)PERYLENE	NE	NE	NE	BENZO(G,H,I)PERYLENE		ND			
BENZO(K)FLUORANTHENE	NE	1.5	14.8	BENZO(K)FLUORANTHENE		ND			
BENZYL BUTYL PHTHALATE	NE	260	NE	BENZYL BUTYL PHTHALATE		ND			
BIPHENYL	NE	51	57.1	BIPHENYL		ND			
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	BIS(2-CHLOROETHOXY) METHANE		ND			
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	BIS(2-CHLOROETHYL) ETHER		ND			
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	BIS(2-ETHYLHEXYL) PHTHALATE		ND			
CAPROLACTAM	NE	31000	NE	CAPROLACTAM	N	ND			
CARBAZOLE	NE	NE	NE	CARBAZOLE		ND			
CHRYSENE	NE	15	148	CHRYSENE		ND			
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	DIBENZ(A,H)ANTHRACENE		ND			
DIBENZOFURAN	NE	78	NE	DIBENZOFURAN		ND			
DIETHYL PHTHALATE	NE	49000	48900	DIETHYL PHTHALATE		ND			
DIMETHYL PHTHALATE	NE	611000	611000	DIMETHYL PHTHALATE		ND			
DI-N-BUTYL PHTHALATE	NE	6100	6110	DI-N-BUTYL PHTHALATE		ND			
DI-N-OCTYLPHTHALATE	NE	730	NE	DI-N-OCTYLPHTHALATE		ND			
FLUORANTHENE	NE	2300	2290	FLUORANTHENE		ND			
FLUORENE	NE	2300	2290	FLUORENE		ND			
HEXACHLOROBENZENE	NE	0.3	3.04	HEXACHLOROBENZENE		ND			
HEXACHLOROBUTADIENE	NE	6.2	61.1	HEXACHLOROBUTADIENE		ND			
HEXACHLOROCYCLOPENTADIENE	NE	370	367	HEXACHLOROCYCLOPENTADIENE		ND			
HEXACHLOROETHANE	NE	12	42.8	HEXACHLOROETHANE		ND			
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	INDENO(1,2,3-C,D)PYRENE		ND			
ISOPHORONE	NE	510	5120	ISOPHORONE		ND			
M,P-CRESOL	NE	NE	NE	M,P-CRESOL		ND			
NAPHTHALENE	NE	3.6	43.0	NAPHTHALENE		ND			
NITROBENZENE	NE	4.8	53.5	NITROBENZENE		ND			
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	N-NITROSODI-N-PROPYLAMINE		ND			
N-NITROSODIPHENYLAMINE	NE	99	993	N-NITROSODIPHENYLAMINE		ND			
PENTACHLOROPHENOL	NE	0.89	8.94	PENTACHLOROPHENOL		ND			
PHENANTHRENE	NE	1830	1830	PHENANTHRENE		ND			
PHENOL	NE	18000	18300	PHENOL		ND			
PYRENE	NE	1700	1720	PYRENE		ND			

Risk Additivity
Soil Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number							
			Sample Date							
			Location	**Risk Additivity Evaluation at Building 921, Holloman AFB**						
			Depth (ft bgs)							
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	**Analyte**	**C / N**	**Max Hit (mg/kg)**	**Cancer Risk**	**NC ratio**		**HQ Contribution**
EXPLOSIVES (mg/kg)				EXPLOSIVES (mg/kg)						
1,3,5-TRINITROBENZENE	NE	2200.0	NE	1,3,5-TRINITROBENZENE		ND				
1,3-DINITROBENZENE	NE	6.10	NE	1,3-DINITROBENZENE		ND				
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	2,4,6-TRINITROTOLUENE		ND				
2,4-DINITROTOLUENE	NE	1.60	15.7	2,4-DINITROTOLUENE		ND				
2,6-DINITROTOLUENE	NE	61.0	61.1	2,6-DINITROTOLUENE		ND				
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	2-AMINO-4,6-DINITROTOLUENE		ND				
2-NITROTOLUENE	NE	2.90	29.1	2-NITROTOLUENE		ND				
3-NITROTOLUENE	NE	6.10	7.82	3-NITROTOLUENE		ND				
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	4-AMINO-2,6-DINITROTOLUENE		ND				
4-NITROTOLUENE	NE	30.0	244.4	4-NITROTOLUENE		ND				
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE		ND				
NITROBENZENE	NE	4.80	53.5	NITROBENZENE		ND				
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZ		ND				
TETRYL	NE	240.0	244.0	TETRYL		ND				
METALS (mg/kg)				METALS (mg/kg)						
ALUMINUM	13722	77000	78000	ALUMINUM	N	18000		0.23		21%
ANTIMONY	1.6	31	31.3	ANTIMONY		ND				
ARSENIC	3.7	0.39	3.90	ARSENIC	C	3.6	9.24E-06			
BARIUM	169	15000	15600	BARIUM	N	118		0.0076		1%
BERYLLIUM	1.6	160	156	BERYLLIUM	N	0.74		0.0047		0.4%
CADMIUM	0.3	70	70.3	CADMIUM		ND				
CALCIUM	317332	NE	NE	CALCIUM		241000		nutrient		
CHROMIUM[d]	25	117000	117000	CHROMIUMd	N	15.9		0.00014		0.01%
COBALT	7.7	23	NE	COBALT	N	5.5		0.24	RSL	22%
COPPER	13	3100	3130	COPPER	N	13.6		0.0043		0.4%
IRON	23049	55000	54800	IRON	N	15500		0.28		26%
LEAD	10.9	400	400	LEAD	N	9.1		0.023		2%
MAGNESIUM	16991	NE	NE	MAGNESIUM		12200		nutrient		
MANGANESE	393	1800	1860	MANGANESE	N	400		0.22		20%
MERCURY	0.0108	10	15.6	MERCURY	N	0.014		0.0009		0.1%
NICKEL	17.4	1500	1560	NICKEL	N	12.4		0.0079		1%
POTASSIUM	5077	NE	NE	POTASSIUM		5550		nutrient		
SELENIUM	1.4	390	391	SELENIUM		ND				
SILVER	1.1	390	391	SILVER		ND				
SODIUM	5196	NE	NE	SODIUM		2610		nutrient		
THALLIUM	1.3	0.78	0.782	THALLIUM		ND				
VANADIUM	42.6	390	391	VANADIUM	N	24.9		0.064		6%
ZINC	54.6	23000	23500	ZINC	N	51.3		0.0022		0.2%

Risk Additivity
Soil Analytical Data
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	Risk Additivity Evaluation at Building 921, Holloman AFB					
			Sample Date						
			Location						
			Depth (ft bgs)						
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio	HQ Contribution
PCBs (mg/kg)				PCBs (mg/kg)					
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	PCB-1016 (AROCLOR 1016)		ND			
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	PCB-1221 (AROCLOR 1221)		ND			
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	PCB-1232 (AROCLOR 1232)		ND			
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	PCB-1242 (AROCLOR 1242)		ND			
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	PCB-1248 (AROCLOR 1248)		ND			
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	PCB-1254 (AROCLOR 1254)		ND			
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	PCB-1260 (AROCLOR 1260)		ND			
PETROLEUM HYDROCARBONS (mg/kg)				PETROLEUM HYDROCARBONS (mg/kg)					
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	GASOLINE RANGE ORGANICS C6-C10		ND			
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	DIESEL RANGE ORGANICS C10-C28		ND			
OIL RANGE ORGANICS C28-C40	NE	NE	1000	OIL RANGE ORGANICS C28-C40		ND			
CYANIDE (mg/kg)				CYANIDE (mg/kg)					
CYANIDE	NE	22.0	46.9	CYANIDE		ND			
TRITIUM (pCi/g)				TRITIUM (pCi/g)					
TRITIUM	NE	NE	NE	TRITIUM		ND			
				SUM =			***9.2E-06***	***1.1***	

Risk Additivity
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Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, February, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
EPA = U.S. Environmental Protection Agency
FD = field duplicate
ft bgs = feet below ground surface
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Risk Additivity
Soil Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531C-IS-0001-071312		OTC531C-IS-0002-071312		OTC531C-IS-0003-071312		OTC531C-IS-0004-071312-FD		OTC531C-IS-0005-071312		OTC531C-IS-0006-071312		OTC531C-IS-0007-071312		OTC531C-IS-0008-071312		OTC531C-IS-0009-071312		OTC531C-IS-0010-071312		OTC531C-IS-0011-071312	
			Sample Date	7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012	
			Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE	**79.5**		**69.4**		**81.6**		**80.5**		**74**		**75.2**		**72.4**		**81.2**		**71.3**		**84.9**		**69.8**	
VOLATILES (mg/kg)																									
1,1,1-TRICHLOROETHANE	NE	8700	15600	0.0015	U	0.0014	U	0.0011	U	0.0010	U	0.0011	U	0.0015	U	0.0012	U	0.0014	U	0.0013	U	0.0012	U	0.0014	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02	0.0016	U	0.0015	U	0.0012	U	0.0011	U	0.0012	U	0.0016	U	0.0013	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100	0.0023	U	0.0022	U	0.0016	U	0.0015	U	0.0017	U	0.0023	U	0.0018	U	0.0021	U	0.002	U	0.0019	U	0.0022	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81	0.0015	U	0.0014	U	0.0011	U	0.0010	U	0.0011	U	0.0015	U	0.0012	U	0.0014	U	0.0013	U	0.0012	U	0.0014	U
1,1-DICHLOROETHANE	NE	3.3	64.5	0.0015	U	0.0014	U	0.0011	U	0.0010	U	0.0011	U	0.0015	U	0.0012	U	0.0014	U	0.0013	U	0.0012	U	0.0014	U
1,1-DICHLOROETHENE	NE	240	449	0.0019	U	0.0018	U	0.0013	U	0.0012	U	0.0014	U	0.0019	U	0.0015	U	0.0017	U	0.0017	U	0.0016	U	0.0018	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0	0.0016	U	0.0015	U	0.0012	U	0.0011	U	0.0012	U	0.0016	U	0.0013	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86	0.0031	U	0.0029	U	0.0022	U	0.002	U	0.0023	U	0.0031	U	0.0025	U	0.0029	U	0.0027	U	0.0026	U	0.0029	U
1,2-DIBROMOETHANE	NE	0.034	0.588	0.0014	U	0.0013	U	0.00096	U	0.00089	U	0.0010	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0013	U
1,2-DICHLOROBENZENE	NE	1900	2310	0.0015	U	0.0014	U	0.0011	U	0.0010	U	0.0011	U	0.0015	U	0.0012	U	0.0014	U	0.0013	U	0.0012	U	0.0014	U
1,2-DICHLOROETHANE	NE	0.43	7.89	0.0014	U	0.0013	U	0.00096	U	0.00089	U	0.0010	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0013	U
1,2-DICHLOROPROPANE	NE	0.94	15.2	0.0016	U	0.0015	U	0.0012	U	0.0011	U	0.0012	U	0.0016	U	0.0013	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U
1,3-DICHLOROBENZENE	NE	NE	NE	0.0016	U	0.0015	U	0.0012	U	0.0011	U	0.0012	U	0.0016	U	0.0013	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U
1,4-DICHLOROBENZENE	NE	2.4	31.7	0.0015	U	0.0014	U	0.0011	U	0.0010	U	0.0011	U	0.0015	U	0.0012	U	0.0014	U	0.0013	U	0.0012	U	0.0014	U
2-HEXANONE	NE	210	NE	0.0074	U	0.0069	U	0.0052	U	0.0048	U	0.0053	U	0.0072	U	0.0059	U	0.0067	U	0.0064	U	0.0061	U	0.0068	U
ACETONE	NE	61000	66600	0.027	U	0.026	U	0.019	U	0.018	U	0.02	U	0.027	U	0.022	U	0.025	U	0.024	U	0.025	J	0.025	U
BENZENE	NE	1.1	15.4	0.002	U	0.0019	U	0.0014	U	0.0013	U	0.0015	U	0.002	U	0.0016	U	0.0019	U	0.0018	U	0.0017	U	0.0019	U
BROMODICHLOROMETHANE	NE	0.27	5.41	0.0015	U	0.0014	U	0.0011	U	0.00097	U	0.0011	U	0.0015	U	0.0012	U	0.0014	U	0.0013	U	0.0012	U	0.0014	U
BROMOFORM	NE	62	616	0.002	U	0.0019	U	0.0014	U	0.0013	U	0.0015	U	0.002	U	0.0016	U	0.0019	U	0.0018	U	0.0017	U	0.0019	U
BROMOMETHANE	NE	7.3	16.5	0.0027	U	0.0026	U	0.0019	U	0.0018	U	0.002	U	0.0027	U	0.0022	U	0.0025	U	0.0024	U	0.0023	U	0.0025	U
CARBON DISULFIDE	NE	820	1530	0.0027	U	0.0026	U	0.0019	U	0.0018	U	0.002	U	0.0027	U	0.0022	U	0.0025	U	0.0024	U	0.0023	U	0.0025	U
CARBON TETRACHLORIDE	NE	0.61	10.8	0.0025	U	0.0023	U	0.0017	U	0.0016	U	0.0018	U	0.0024	U	0.002	U	0.0022	U	0.0021	U	0.002	U	0.0023	U
CHLOROBENZENE	NE	290	376	0.0014	U	0.0013	U	0.00096	U	0.00089	U	0.00099	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0013	U
CHLOROETHANE	NE	15000	29800	0.0027	U	0.0026	U	0.0019	U	0.0018	U	0.002	U	0.0027	U	0.0022	U	0.0025	U	0.0024	U	0.0023	U	0.0025	U
CHLOROFORM	NE	0.29	5.86	0.0016	U	0.0015	U	0.0012	U	0.0011	U	0.0012	U	0.0016	U	0.0013	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U
CHLOROMETHANE	NE	120	275	0.0027	U	0.0026	U	0.0019	U	0.0018	U	0.002	U	0.0027	U	0.0022	U	0.0025	U	0.0024	U	0.0023	U	0.0025	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156	0.002	U	0.0019	U	0.0014	U	0.0013	U	0.0015	U	0.002	U	0.0016	U	0.0019	U	0.0018	U	0.0017	U	0.0019	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	0.0014	U	0.0013	U	0.00096	U	0.00089	U	0.00099	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0013	U
CYCLOHEXANE	NE	7000	NE	0.0019	U	0.0018	U	0.0013	U	0.0012	U	0.0014	U	0.0019	U	0.0015	U	0.0017	U	0.0017	U	0.0016	U	0.0018	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1	0.0014	U	0.0013	U	0.00096	U	0.00089	U	0.00099	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0013	U
DICHLORODIFLUOROMETHANE	NE	94	168	0.002	U	0.0019	U	0.0014	U	0.0013	U	0.0015	U	0.002	U	0.0016	U	0.0019	U	0.0018	U	0.0017	U	0.0019	U
ETHYLBENZENE	NE	5.4	68.4	0.0014	U	0.0013	U	0.00096	U	0.00089	U	0.00099	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0013	U
ISOPROPYLBENZENE	NE	2100	2430	0.0015	U	0.0014	U	0.0011	U	0.00097	U	0.0011	U	0.0015	U	0.0012	U	0.0014	U	0.0013	U	0.0012	U	0.0014	U
METHYL ACETATE	NE	78000	78200	0.017	U	0.016	U	0.012	U	0.011	U	0.012	U	0.017	U	0.014	U	0.016	U	0.015	U	0.014	U	0.016	U
METHYL ETHYL KETONE	NE	28000	37100	0.0083	U	0.0078	U	0.0059	U	0.0054	U	0.006	U	0.0082	U	0.0066	U	0.0076	U	0.007	U	0.0069	U	0.0077	U
METHYL ISOBUTYL KETONE	NE	5300	5820	0.0075	U	0.0071	U	0.0053	U	0.00490	U	0.0054	U	0.0074	U	0.006	U	0.0068	U	0.0065	U	0.0062	U	0.007	U
METHYLCYCLOHEXANE	NE	5630	5630	0.0018	U	0.0017	U	0.0012	U	0.0012	U	0.0013	U	0.0017	U	0.0014	U	0.0016	U	0.0015	U	0.0015	U	0.0016	U
METHYLENE CHLORIDE	NE	56	409	0.0063	U	0.0059	U	0.0044	U	0.0041	U	0.0045	U	0.0062	U	0.005	U	0.0057	U	0.0055	U	0.0052	U	0.0058	U

Risk Additivity
Soil Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC531C-IS-0001-071312		OTC531C-IS-0002-071312		OTC531C-IS-0003-071312		OTC531C-IS-0004-071312-FD		OTC531C-IS-0005-071312		OTC531C-IS-0006-071312		OTC531C-IS-0007-071312		OTC531C-IS-0008-071312		OTC531C-IS-0009-071312		OTC531C-IS-0010-071312		OTC531C-IS-0011-071312	
				Sample Date	7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																										
STYRENE	NE	6300	7280		0.0035	U	0.0033	U	0.0025	U	0.0023	U	0.0026	U	0.0035	U	0.0028	U	0.0032	U	0.0031	U	0.0029	U	0.0033	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0027	U	0.0026	U	0.0019	U	0.0018	U	0.002	U	0.0027	U	0.0022	U	0.0025	U	0.0024	U	0.0023	U	0.0025	U
TETRACHLOROETHYLENE	NE	22	7.02		0.0014	U	0.0013	U	0.00096	U	0.00089	U	0.00099	U	0.0013	U	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0013	U
TOLUENE	NE	5000	5270		0.0016	U	0.0015	U	0.0012	U	0.0011	U	0.0012	U	0.0016	U	0.0013	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.002	U	0.0019	U	0.0014	U	0.0013	U	0.0015	U	0.002	U	0.0016	U	0.0019	U	0.0018	U	0.0017	U	0.0019	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0015	U	0.0014	U	0.0011	U	0.00097	U	0.0011	U	0.0015	U	0.0012	U	0.0014	U	0.0013	U	0.0012	U	0.0014	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0016	U	0.0015	U	0.0012	U	0.0011	U	0.0012	U	0.0016	U	0.0013	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0027	U	0.0026	U	0.0019	U	0.0018	U	0.002	U	0.0027	U	0.0022	U	0.0025	U	0.0024	U	0.0023	U	0.0025	U
VINYL CHLORIDE	NE	0.06	0.728		0.002	U	0.0019	U	0.0014	U	0.0013	U	0.0015	U	0.002	U	0.0016	U	0.0019	U	0.0018	U	0.0017	U	0.0019	U
XYLENES, TOTAL	NE	630	814		0.0044	U	0.0041	U	0.0031	U	0.0028	U	0.0032	U	0.004	U	0.0035	U	0.004	U	0.0038	U	0.0036	U	0.004	U
SEMIVOLATILES (mg/kg)																										
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
2,4-DICHLOROPHENOL	NE	180	183		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.026	U	0.03	U	0.026	U	0.026	U	0.028	U	0.028	U	0.029	U	0.025	U	0.029	U	0.025	U	0.03	U
2,4-DINITROPHENOL	NE	120	122		0.42	U	0.48	U	0.41	U	0.41	U	0.45	U	0.44	U	0.46	U	0.4	U	0.46	U	0.39	U	0.48	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
2,6-DINITROTOLUENE	NE	61	61.1		0.025	U	0.028	U	0.024	U	0.024	U	0.026	U	0.026	U	0.027	U	0.024	U	0.027	U	0.023	U	0.028	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
2-CHLOROPHENOL	NE	390	391		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
2-METHYLNAPHTHALENE	NE	230	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
2-METHYLPHENOL	NE	3100	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
2-NITROANILINE	NE	610	NE		0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
2-NITROPHENOL	NE	NE	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
3-NITROANILINE	NE	NE	NE		0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.084	U	0.095	U	0.081	U	0.083	U	0.09	U	0.089	U	0.091	U	0.081	U	0.093	U	0.079	U	0.095	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
4-CHLOROANILINE	NE	2.4	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
4-NITROANILINE	NE	24	NE		0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
4-NITROPHENOL	NE	NE	NE		0.17	U	0.19	U	0.16	U	0.17	U	0.18	U	0.18	U	0.18	U	0.16	U	0.19	U	0.16	U	0.19	U
ACENAPHTHENE	NE	3400	3440		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
ACENAPHTHYLENE	NE	NE	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
ACETOPHENONE	NE	7800	7820		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
ANTHRACENE	NE	17000	17200		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
ATRAZINE	NE	2.1	NE		0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U

Risk Additivity
Soil Analytical Data
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Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531C-IS-0001-071312		OTC531C-IS-0002-071312		OTC531C-IS-0003-071312		OTC531C-IS-0004-071312-FD		OTC531C-IS-0005-071312		OTC531C-IS-0006-071312		OTC531C-IS-0007-071312		OTC531C-IS-0008-071312		OTC531C-IS-0009-071312		OTC531C-IS-0010-071312		OTC531C-IS-0011-071312	
			Sample Date	7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012	
			Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																									
BENZALDEHYDE	NE	7800	NE	0.21	U	0.24	U	0.2	U	0.21	U	0.22	U	0.22	U	0.23	U	0.2	U	0.23	U	0.2	U	0.24	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
BENZO(A)PYRENE	NE	0.015	0.148	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
BIPHENYL	NE	51	57.1	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.084	U	0.095	U	0.081	U	0.083	U	0.09	U	0.089	U	0.091	U	0.081	U	0.093	U	0.079	U	0.095	U
CAPROLACTAM	NE	31000	NE	0.067	U	0.076	U	0.065	U	0.066	U	0.072	U	0.071	U	0.073	U	0.065	U	0.074	U	0.063	U	0.076	U
CARBAZOLE	NE	NE	NE	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
CHRYSENE	NE	15	148	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
DIBENZOFURAN	NE	78	NE	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
DIETHYL PHTHALATE	NE	49000	48900	0.084	U	0.095	U	0.081	U	0.083	U	0.09	U	0.089	U	0.091	U	0.081	U	0.093	U	0.079	U	0.095	U
DIMETHYL PHTHALATE	NE	611000	611000	0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.084	U	0.095	U	0.081	U	0.083	U	0.09	U	0.089	U	0.091	U	0.081	U	0.093	U	0.079	U	0.095	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
FLUORANTHENE	NE	2300	2290	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
FLUORENE	NE	2300	2290	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.092	U	0.1	U	0.089	U	0.091	U	0.099	U	0.098	U	0.100	U	0.089	U	0.1	U	0.086	U	0.1	U
HEXACHLOROETHANE	NE	12	42.8	0.042	U	0.048	U	0.041	U	0.041	U	0.045	U	0.044	U	0.046	U	0.04	U	0.046	U	0.039	U	0.048	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
ISOPHORONE	NE	510	5120	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
M,P-CRESOL	NE	NE	NE	0.030	U	0.034	U	0.029	U	0.03	U	0.032	U	0.032	U	0.033	U	0.029	U	0.033	U	0.028	U	0.034	U
NAPHTHALENE	NE	3.6	43.0	0.034	U	0.038	U	0.032	U	0.033	U	0.036	U	0.035	U	0.036	U	0.032	U	0.037	U	0.031	U	0.038	U
NITROBENZENE	NE	4.8	53.5	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.250	U	0.29	U	0.24	U	0.25	U	0.27	U	0.27	U	0.27	U	0.24	U	0.28	U	0.24	U	0.29	U
PHENANTHRENE	NE	1830	1830	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
PHENOL	NE	18000	18300	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U
PYRENE	NE	1700	1720	0.021	U	0.024	U	0.02	U	0.021	U	0.022	U	0.022	U	0.023	U	0.02	U	0.023	U	0.02	U	0.024	U

Risk Additivity
Soil Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC531C-IS-0001-071312		OTC531C-IS-0002-071312		OTC531C-IS-0003-071312		OTC531C-IS-0004-071312-FD		OTC531C-IS-0005-071312		OTC531C-IS-0006-071312		OTC531C-IS-0007-071312		OTC531C-IS-0008-071312		OTC531C-IS-0009-071312		OTC531C-IS-0010-071312		OTC531C-IS-0011-071312	
			Sample Date	7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012	
			Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																									
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
1,3-DINITROBENZENE	NE	6.10	NE	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
2,4-DINITROTOLUENE	NE	1.60	15.7	0.081	U	0.094	U	0.072	U	0.080	U	0.091	U	0.077	U	0.076	U	0.074	U	0.087	U	0.094	U	0.09	U
2,6-DINITROTOLUENE	NE	61.0	61.1	0.072	U	0.084	U	0.065	U	0.071	U	0.082	U	0.069	U	0.068	U	0.066	U	0.078	U	0.084	U	0.081	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
2-NITROTOLUENE	NE	2.90	29.1	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
3-NITROTOLUENE	NE	6.10	7.82	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
4-NITROTOLUENE	NE	30.0	244.4	0.084	U	0.098	U	0.075	U	0.083	U	0.095	U	0.080	U	0.079	U	0.077	U	0.091	U	0.098	U	0.094	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
NITROBENZENE	NE	4.80	53.5	0.077	U	0.090	U	0.069	U	0.076	U	0.087	U	0.074	U	0.073	U	0.071	U	0.084	U	0.09	U	0.086	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
TETRYL	NE	240.0	244.0	0.067	U	0.077	U	0.059	U	0.066	U	0.075	U	0.064	U	0.063	U	0.061	U	0.072	U	0.078	U	0.074	U
METALS (mg/kg)																									
ALUMINUM	13722	77000	78000	**2520**		**1380**		**7360**		**6190**		**1550**		**2410**		**2000**		**8420**		**1890**		**10100**		**1620**	
ANTIMONY	1.6	31	31.3	1	U	1.2	U	1.1	U	1.2	U	1.1	U	0.95	U	1.3	U	1.1	U	1.3	U	1	U	1.2	U
ARSENIC	3.7	0.39	3.90	1	U	1.2	U	**1.8**	J	1.2	U	1.1	U	0.95	U	1.3	U	**1.7**	J	1.3	U	**2.5**	J	1.2	U
BARIUM	169	15000	15600	**30.2**	J	**13.6**	J	**68.3**	J	**46.9**	J	**14.2**	J	**33.7**	J	**19.9**	J	**97.5**	J	**23.1**	J	**87.1**	J	**19.6**	J
BERYLLIUM	1.6	160	156	0.52	U	0.59	U	0.57	U	0.59	U	0.56	U	0.47	U	0.64	U	0.54	U	0.67	U	0.52	U	0.59	U
CADMIUM	0.3	70	70.3	0.52	U	0.59	U	0.57	U	0.59	U	0.56	U	0.47	U	0.64	U	0.54	U	0.67	U	0.52	U	0.59	U
CALCIUM	317332	NE	NE	**218000**		**241000**		**204000**		**204000**		**215000**		**246000**		**262000**		**181000**		**246000**		**146000**		**238000**	
CHROMIUM[d]	25	117000	117000	**2.3**	J	**1.4**	J	**8.6**		**7.2**		**1.4**	J	**2.1**	J	**2.5**	J	**7.2**		**2**	J	**8.8**		**1.7**	J
COBALT	7.7	23	NE	**1.2**	J	0.59	U	**3.4**	J	**2.4**	J	0.56	U	**1.1**	J	**0.64**	J	**2.7**	J	0.67	U	**3.6**	J	0.59	U
COPPER	13	3100	3130	**2.3**	J	1.2	U	**3.7**	J	**3**	J	**3.3**	J	**2**	J	**1.5**	J	**6**	J	**1.7**	J	**8.2**	J	**1.5**	J
IRON	23049	55000	54800	**2230**		**1260**		**7510**		**6120**		**1630**		**2020**		**1810**		**7040**		**1700**		**8750**		**1470**	
LEAD	10.9	400	400	**1.1**	J	0.59	U	**4**	J	**2.9**	J	0.56	U	**0.66**	J	**0.74**	J	**4.1**	J	**0.73**	J	**6.3**	J	0.59	U
MAGNESIUM	16991	NE	NE	**2160**	J	**857**	J	**6070**		**6280**		**970**	J	**3340**		**1550**	J	**4980**		**1070**	J	**7520**		**908**	J
MANGANESE	393	1800	1860	**37.5**		**20.7**		**142**		**111**		**26**		**39.2**		**38.3**		**145**		**34.8**		**208**		**25.5**	
MERCURY	0.0108	10	15.6	0.0098	U	0.012	U	0.0097	U	0.0097	U	0.01	U	0.01	U	0.011	U	0.0096	U	0.011	U	0.0092	U	0.011	U
NICKEL	17.4	1500	1560	**2.4**	J	**0.84**	J	**7.4**	J	**6.1**	J	**0.77**	J	**2.5**	J	**1.4**	J	**5.8**	J	**1.2**	J	**7.8**	J	**0.89**	J
POTASSIUM	5077	NE	NE	**721**	J	**412**	J	**1950**	J	**1640**	J	**424**	J	**933**	J	**589**	J	**3020**	J	**571**	J	**3800**	J	**492**	J
SELENIUM	1.4	390	391	2.1	U	2.4	U	2.3	U	2.4	U	2.3	U	1.9	U	2.6	U	2.2	U	2.7	U	2.1	U	2.3	U
SILVER	1.1	390	391	0.52	U	0.59	U	0.57	U	0.59	U	0.56	U	0.47	U	0.64	U	0.54	U	0.67	U	0.52	U	0.59	U
SODIUM	5196	NE	NE	580	U	650	U	**972**	J	**932**	J	620	U	**2950**	J	**774**	J	**2560**	J	740	U	**3250**	J	**758**	J
THALLIUM	1.3	0.78	0.782	1.4	U	1.5	U	1.5	U	1.5	U	1.5	U	1.2	U	1.7	U	1.4	U	1.8	U	1.4	U	1.5	U
VANADIUM	42.6	390	391	**8.8**	J	**2.9**	J	**15**	J	**11.9**	J	**3.3**	J	**6.4**	J	**3.8**	J	**13.4**	J	**3.3**	J	**17.6**	J	**2.9**	J
ZINC	54.6	23000	23500	**5.3**	J	3	U	**19.5**		**16.1**		**3.3**	J	**5.3**	J	**5.1**	J	**20.9**		**4.1**	J	**28**		**3.2**	J

Risk Additivity
Soil Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC531C-IS-0001-071312		OTC531C-IS-0002-071312		OTC531C-IS-0003-071312		OTC531C-IS-0004-071312-FD		OTC531C-IS-0005-071312		OTC531C-IS-0006-071312		OTC531C-IS-0007-071312		OTC531C-IS-0008-071312		OTC531C-IS-0009-071312		OTC531C-IS-0010-071312		OTC531C-IS-0011-071312	
				Sample Date	7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01		Station 4, MW-01	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																										
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93		0.008	U	0.0097	U	0.0083	U	0.0083	U	0.0089	U	0.0087	U	0.0091	U	0.008	U	0.0092	U	0.008	U	0.0097	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49		0.010	U	0.012	U	0.0100	U	0.0100	U	0.011	U	0.011	U	0.011	U	0.010	U	0.011	U	0.010	U	0.012	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49		0.010	U	0.012	U	0.0100	U	0.0100	U	0.011	U	0.011	U	0.011	U	0.010	U	0.011	U	0.010	U	0.012	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22		0.008	U	0.0097	U	0.0083	U	0.0083	U	0.0089	U	0.0087	U	0.0091	U	0.008	U	0.0092	U	0.008	U	0.0097	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22		0.008	U	0.0097	U	0.0083	U	0.0083	U	0.0089	U	0.0087	U	0.0091	U	0.008	U	0.0092	U	0.008	U	0.0097	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12		0.008	U	0.0097	U	0.0083	U	0.0083	U	0.0089	U	0.0087	U	0.0091	U	0.008	U	0.0092	U	0.008	U	0.0097	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22		0.008	U	0.0097	U	0.0083	U	0.0083	U	0.0089	U	0.0087	U	0.0091	U	0.008	U	0.0092	U	0.008	U	0.0097	U
PETROLEUM HYDROCARBONS (mg/kg)																										
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000		3.9	U	3.8	U	2.9	U	3.8	U	3.2	U	5.3	U	3.5	U	3.7	U	4.2	U	3.5	U	4.4	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000		4.2	U	4.8	U	4.1	U	4.1	U	4.4	U	4.5	U	4.6	U	4.1	U	4.8	U	3.9	U	4.8	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000		4.2	U	4.8	U	4.1	U	4.1	U	4.4	U	4.5	U	4.6	U	4.1	U	4.8	U	3.9	U	4.8	U
CYANIDE (mg/kg)																										
CYANIDE	NE	22.0	46.9		0.075	U	0.086	U	0.14	U	0.075	U	0.081	U	0.08	U	0.083	U	0.071	U	0.081	U	0.071	U	0.086	U
TRITIUM (pCi/g)																										
TRITIUM	NE	NE	NE		4.9	U	4.81	U	4.86	U	4.83	U	4.81	U	4.9	U	4.18	U	4.98	U	4.67	U	4.91	U	4.89	U

Risk Additivity
Soil Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number
			Sample Date
			Location
			Depth (ft bgs)
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**
PERCENT SOLIDS	NE	NE	NE
VOLATILES (mg/kg)			
1,1,1-TRICHLOROETHANE	NE	8700	15600
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100
1,1,2-TRICHLOROETHANE	NE	1.1	2.81
1,1-DICHLOROETHANE	NE	3.3	64.5
1,1-DICHLOROETHENE	NE	240	449
1,2,4-TRICHLOROBENZENE	NE	22	73.0
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86
1,2-DIBROMOETHANE	NE	0.034	0.588
1,2-DICHLOROBENZENE	NE	1900	2310
1,2-DICHLOROETHANE	NE	0.43	7.89
1,2-DICHLOROPROPANE	NE	0.94	15.2
1,3-DICHLOROBENZENE	NE	NE	NE
1,4-DICHLOROBENZENE	NE	2.4	31.7
2-HEXANONE	NE	210	NE
ACETONE	NE	61000	66600
BENZENE	NE	1.1	15.4
BROMODICHLOROMETHANE	NE	0.27	5.41
BROMOFORM	NE	62	616
BROMOMETHANE	NE	7.3	16.5
CARBON DISULFIDE	NE	820	1530
CARBON TETRACHLORIDE	NE	0.61	10.8
CHLOROBENZENE	NE	290	376
CHLOROETHANE	NE	15000	29800
CHLOROFORM	NE	0.29	5.86
CHLOROMETHANE	NE	120	275
CIS-1,2-DICHLOROETHYLENE	NE	160	156
CIS-1,3-DICHLOROPROPENE	NE	NE	NE
CYCLOHEXANE	NE	7000	NE
DIBROMOCHLOROMETHANE	NE	0.68	12.1
DICHLORODIFLUOROMETHANE	NE	94	168
ETHYLBENZENE	NE	5.4	68.4
ISOPROPYLBENZENE	NE	2100	2430
METHYL ACETATE	NE	78000	78200
METHYL ETHYL KETONE	NE	28000	37100
METHYL ISOBUTYL KETONE	NE	5300	5820
METHYLCYCLOHEXANE	NE	5630	5630
METHYLENE CHLORIDE	NE	56	409

Risk Additivity Evaluation at Building 922, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
PERCENT SOLIDS				
VOLATILES (mg/kg)				
1,1,1-TRICHLOROETHANE		ND		
1,1,2,2-TETRACHLOROETHANE		ND		
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND		
1,1,2-TRICHLOROETHANE		ND		
1,1-DICHLOROETHANE		ND		
1,1-DICHLOROETHENE		ND		
1,2,4-TRICHLOROBENZENE		ND		
1,2-DIBROMO-3-CHLOROPROPANE		ND		
1,2-DIBROMOETHANE		ND		
1,2-DICHLOROBENZENE		ND		
1,2-DICHLOROETHANE		ND		
1,2-DICHLOROPROPANE		ND		
1,3-DICHLOROBENZENE		ND		
1,4-DICHLOROBENZENE		ND		
2-HEXANONE		ND		
ACETONE		ND		
BENZENE		ND		
BROMODICHLOROMETHANE		ND		
BROMOFORM		ND		
BROMOMETHANE		ND		
CARBON DISULFIDE		ND		
CARBON TETRACHLORIDE		ND		
CHLOROBENZENE		ND		
CHLOROETHANE		ND		
CHLOROFORM		ND		
CHLOROMETHANE		ND		
CIS-1,2-DICHLOROETHYLENE		ND		
CIS-1,3-DICHLOROPROPENE		ND		
CYCLOHEXANE		ND		
DIBROMOCHLOROMETHANE		ND		
DICHLORODIFLUOROMETHANE		ND		
ETHYLBENZENE		ND		
ISOPROPYLBENZENE		ND		
METHYL ACETATE		ND		
METHYL ETHYL KETONE		ND		
METHYL ISOBUTYL KETONE		ND		
METHYLCYCLOHEXANE		ND		
METHYLENE CHLORIDE		ND		

Risk Additivity
Soil Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	Sample Date	Location	Depth (ft bgs)
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]			
VOLATILES - continued (mg/kg)						
STYRENE	NE	6300	7280			
TERT-BUTYL METHYL ETHER	NE	43	901			
TETRACHLOROETHYLENE	NE	22	7.02			
TOLUENE	NE	5000	5270			
TRANS-1,2-DICHLOROETHENE	NE	150	270			
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE			
TRICHLOROETHYLENE	NE	0.91	8.77			
TRICHLOROFLUOROMETHANE	NE	790	1410			
VINYL CHLORIDE	NE	0.06	0.728			
XYLENES, TOTAL	NE	630	814			
SEMIVOLATILES (mg/kg)						
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE			
2,4,5-TRICHLOROPHENOL	NE	6100	6110			
2,4,6-TRICHLOROPHENOL	NE	44	61.1			
2,4-DICHLOROPHENOL	NE	180	183			
2,4-DIMETHYLPHENOL	NE	1200	1220			
2,4-DINITROPHENOL	NE	120	122			
2,4-DINITROTOLUENE	NE	1.6	15.7			
2,6-DINITROTOLUENE	NE	61	61.1			
2-CHLORONAPHTHALENE	NE	6300	6260			
2-CHLOROPHENOL	NE	390	391			
2-METHYLNAPHTHALENE	NE	230	NE			
2-METHYLPHENOL	NE	3100	NE			
2-NITROANILINE	NE	610	NE			
2-NITROPHENOL	NE	NE	NE			
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8			
3-NITROANILINE	NE	NE	NE			
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89			
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE			
4-CHLORO-3-METHYLPHENOL	NE	6100	NE			
4-CHLOROANILINE	NE	2.4	NE			
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE			
4-NITROANILINE	NE	24	NE			
4-NITROPHENOL	NE	NE	NE			
ACENAPHTHENE	NE	3400	3440			
ACENAPHTHYLENE	NE	NE	NE			
ACETOPHENONE	NE	7800	7820			
ANTHRACENE	NE	17000	17200			
ATRAZINE	NE	2.1	NE			

Risk Additivity Evaluation at Building 922, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
VOLATILES - continued (mg/kg)				
STYRENE		ND		
TERT-BUTYL METHYL ETHER		ND		
TETRACHLOROETHYLENE		ND		
TOLUENE		ND		
TRANS-1,2-DICHLOROETHENE		ND		
TRANS-1,3-DICHLOROPROPENE		ND		
TRICHLOROETHYLENE		ND		
TRICHLOROFLUOROMETHANE		ND		
VINYL CHLORIDE		ND		
XYLENES, TOTAL		ND		
SEMIVOLATILES (mg/kg)				
2,2'-OXYBIS(1-CHLORO)PROPANE		ND		
2,4,5-TRICHLOROPHENOL		ND		
2,4,6-TRICHLOROPHENOL		ND		
2,4-DICHLOROPHENOL		ND		
2,4-DIMETHYLPHENOL		ND		
2,4-DINITROPHENOL		ND		
2,4-DINITROTOLUENE		ND		
2,6-DINITROTOLUENE		ND		
2-CHLORONAPHTHALENE		ND		
2-CHLOROPHENOL		ND		
2-METHYLNAPHTHALENE		ND		
2-METHYLPHENOL		ND		
2-NITROANILINE		ND		
2-NITROPHENOL		ND		
3,3'-DICHLOROBENZIDINE		ND		
3-NITROANILINE		ND		
4,6-DINITRO-2-METHYLPHENOL		ND		
4-BROMOPHENYL PHENYL ETHER		ND		
4-CHLORO-3-METHYLPHENOL		ND		
4-CHLOROANILINE		ND		
4-CHLOROPHENYL PHENYL ETHER		ND		
4-NITROANILINE		ND		
4-NITROPHENOL		ND		
ACENAPHTHENE		ND		
ACENAPHTHYLENE		ND		
ACETOPHENONE		ND		
ANTHRACENE		ND		
ATRAZINE		ND		

Risk Additivity
Soil Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number					
			Sample Date					
			Location					
			Depth (ft bgs)					
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]					
SEMIVOLATILES - continued (mg/kg)								
BENZALDEHYDE	NE	7800	NE					
BENZO(A)ANTHRACENE	NE	0.15	1.48					
BENZO(A)PYRENE	NE	0.015	0.148					
BENZO(B)FLUORANTHENE	NE	0.15	1.48					
BENZO(G,H,I)PERYLENE	NE	NE	NE					
BENZO(K)FLUORANTHENE	NE	1.5	14.8					
BENZYL BUTYL PHTHALATE	NE	260	NE					
BIPHENYL	NE	51	57.1					
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE					
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68					
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347					
CAPROLACTAM	NE	31000	NE					
CARBAZOLE	NE	NE	NE					
CHRYSENE	NE	15	148					
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148					
DIBENZOFURAN	NE	78	NE					
DIETHYL PHTHALATE	NE	49000	48900					
DIMETHYL PHTHALATE	NE	611000	611000					
DI-N-BUTYL PHTHALATE	NE	6100	6110					
DI-N-OCTYLPHTHALATE	NE	730	NE					
FLUORANTHENE	NE	2300	2290					
FLUORENE	NE	2300	2290					
HEXACHLOROBENZENE	NE	0.3	3.04					
HEXACHLOROBUTADIENE	NE	6.2	61.1					
HEXACHLOROCYCLOPENTADIENE	NE	370	367					
HEXACHLOROETHANE	NE	12	42.8					
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48					
ISOPHORONE	NE	510	5120					
M,P-CRESOL	NE	NE	NE					
NAPHTHALENE	NE	3.6	43.0					
NITROBENZENE	NE	4.8	53.5					
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE					
N-NITROSODIPHENYLAMINE	NE	99	993					
PENTACHLOROPHENOL	NE	0.89	8.94					
PHENANTHRENE	NE	1830	1830					
PHENOL	NE	18000	18300					
PYRENE	NE	1700	1720					

Risk Additivity Evaluation at Building 922, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
SEMIVOLATILES - continued (mg/kg)				
BENZALDEHYDE		ND		
BENZO(A)ANTHRACENE		ND		
BENZO(A)PYRENE		ND		
BENZO(B)FLUORANTHENE		ND		
BENZO(G,H,I)PERYLENE		ND		
BENZO(K)FLUORANTHENE		ND		
BENZYL BUTYL PHTHALATE		ND		
BIPHENYL		ND		
BIS(2-CHLOROETHOXY) METHANE		ND		
BIS(2-CHLOROETHYL) ETHER		ND		
BIS(2-ETHYLHEXYL) PHTHALATE		ND		
CAPROLACTAM		ND		
CARBAZOLE		ND		
CHRYSENE		ND		
DIBENZ(A,H)ANTHRACENE		ND		
DIBENZOFURAN		ND		
DIETHYL PHTHALATE		ND		
DIMETHYL PHTHALATE		ND		
DI-N-BUTYL PHTHALATE		ND		
DI-N-OCTYLPHTHALATE		ND		
FLUORANTHENE		ND		
FLUORENE		ND		
HEXACHLOROBENZENE		ND		
HEXACHLOROBUTADIENE		ND		
HEXACHLOROCYCLOPENTADIENE		ND		
HEXACHLOROETHANE		ND		
INDENO(1,2,3-C,D)PYRENE		ND		
ISOPHORONE		ND		
M,P-CRESOL		ND		
NAPHTHALENE		ND		
NITROBENZENE		ND		
N-NITROSODI-N-PROPYLAMINE		ND		
N-NITROSODIPHENYLAMINE		ND		
PENTACHLOROPHENOL		ND		
PHENANTHRENE		ND		
PHENOL		ND		
PYRENE		ND		

Risk Additivity
Soil Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	Sample Date	Location	Depth (ft bgs)
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]			
EXPLOSIVES (mg/kg)						
1,3,5-TRINITROBENZENE	NE	2200.0	NE			
1,3-DINITROBENZENE	NE	6.10	NE			
2,4,6-TRINITROTOLUENE	NE	19.0	39.1			
2,4-DINITROTOLUENE	NE	1.60	15.7			
2,6-DINITROTOLUENE	NE	61.0	61.1			
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE			
2-NITROTOLUENE	NE	2.90	29.1			
3-NITROTOLUENE	NE	6.10	7.82			
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE			
4-NITROTOLUENE	NE	30.0	244.4			
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2			
NITROBENZENE	NE	4.80	53.5			
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7			
TETRYL	NE	240.0	244.0			
METALS (mg/kg)						
ALUMINUM	13722	77000	78000			
ANTIMONY	1.6	31	31.3			
ARSENIC	3.7	0.39	3.90			
BARIUM	169	15000	15600			
BERYLLIUM	1.6	160	156			
CADMIUM	0.3	70	70.3			
CALCIUM	317332	NE	NE			
CHROMIUM[d]	25	117000	117000			
COBALT	7.7	23	NE			
COPPER	13	3100	3130			
IRON	23049	55000	54800			
LEAD	10.9	400	400			
MAGNESIUM	16991	NE	NE			
MANGANESE	393	1800	1860			
MERCURY	0.0108	10	15.6			
NICKEL	17.4	1500	1560			
POTASSIUM	5077	NE	NE			
SELENIUM	1.4	390	391			
SILVER	1.1	390	391			
SODIUM	5196	NE	NE			
THALLIUM	1.3	0.78	0.782			
VANADIUM	42.6	390	391			
ZINC	54.6	23000	23500			

Risk Additivity Evaluation at Building 922, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio	
EXPLOSIVES (mg/kg)					
1,3,5-TRINITROBENZENE		ND			
1,3-DINITROBENZENE		ND			
2,4,6-TRINITROTOLUENE		ND			
2,4-DINITROTOLUENE		ND			
2,6-DINITROTOLUENE		ND			
2-AMINO-4,6-DINITROTOLUENE		ND			
2-NITROTOLUENE		ND			
3-NITROTOLUENE		ND			
4-AMINO-2,6-DINITROTOLUENE		ND			
4-NITROTOLUENE		ND			
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE		ND			
NITROBENZENE		ND			
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE		ND			
TETRYL		ND			
METALS (mg/kg)					
ALUMINUM	N	10100		0.13	
ANTIMONY	N	ND			
ARSENIC	C	2.5	6.41E-06		
BARIUM	N	97.5		0.0063	
BERYLLIUM	N	ND			
CADMIUM		ND			
CALCIUM		246000		nutrient	
CHROMIUMd	N	8.8		0.00008	
COBALT	N	3.6		0.16	RSL
COPPER	N	8.2		0.0026	
IRON	N	8750		0.16	
LEAD	N	6.3		0.016	
MAGNESIUM		7520		nutrient	
MANGANESE	N	208		0.11	
MERCURY	N	ND			
NICKEL	N	7.8		0.0050	
POTASSIUM		3800		nutrient	
SELENIUM		ND			
SILVER		ND			
SODIUM		3250		nutrient	
THALLIUM		ND			
VANADIUM	N	17.6		0.045	
ZINC	N	28		0.0012	

Risk Additivity
Soil Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number		
			Sample Date		
			Location		
			Depth (ft bgs)		
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]		
PCBs (mg/kg)					
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93		
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49		
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49		
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22		
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22		
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12		
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22		
PETROLEUM HYDROCARBONS (mg/kg)					
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000		
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000		
OIL RANGE ORGANICS C28-C40	NE	NE	1000		
CYANIDE (mg/kg)					
CYANIDE	NE	22.0	46.9		
TRITIUM (pCi/g)					
TRITIUM	NE	NE	NE		

Risk Additivity Evaluation at Building 922, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
PCBs (mg/kg)				
PCB-1016 (AROCLOR 1016)		ND		
PCB-1221 (AROCLOR 1221)		ND		
PCB-1232 (AROCLOR 1232)		ND		
PCB-1242 (AROCLOR 1242)		ND		
PCB-1248 (AROCLOR 1248)		ND		
PCB-1254 (AROCLOR 1254)		ND		
PCB-1260 (AROCLOR 1260)		ND		
PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10		ND		
DIESEL RANGE ORGANICS C10-C28		ND		
OIL RANGE ORGANICS C28-C40		ND		
CYANIDE (mg/kg)				
CYANIDE		ND		
TRITIUM (pCi/g)				
TRITIUM		ND		
		SUM =	***6.4E-06***	***0.63***

Risk Additivity
Soil Analytical Data
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, February, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
EPA = U.S. Environmental Protection Agency
FD = field duplicate
ft bgs = feet below ground surface
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

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Appendix L
Ecological Evaluation

NEW MEXICO ENVIRONMENT DEPARTMENT
SITE ASSESSMENT CHECKLIST
(From NMED (2012) Attachment A)

I. SITE LOCATION

1. Site Name: Buildings 920, 921, and 922 (OT-C531A, B, and C) Inactive Septic Systems
   US EPA I.D. Number: NM6572124422
   Location: Tularosa Basin within Holloman Air Force Base (HAFB)
   County: Otero
   City: HAFB _____ State: NM

2. Latitude: 32º 50´ 25.470˝ N Longitude: 106º 7´ 37.236˝ W - (OT-C531A)
   Latitude: 32º 50´ 20.930˝ N Longitude: 106º 7´ 36.030˝ W - (OT-C531B)
   Latitude: 32º 50´ 14.727˝ N Longitude: 106º 7´ 34.877˝ W - (OT-C531C)

3. Attach site maps, including a topographical map, a diagram which illustrates the layout of the facility (e.g., site boundaries, structures, etc.), and maps showing all habitat areas identified in Section III of the checklist. Also, include maps which illustrate known release areas, sampling locations, and any other important features, if available. Note: Site maps and supporting information that include (1) a Physiographic Map, (2) a Site Layout and Sampling Location Map, and (3) a Site Photo Log are generally included for all sites in the RFI reports. A site habitat map and a Google Earth photo that shows the site habitat are attached to this Site Assessment checklist.

II. SITE CHARACTERIZATION

1. Indicate the approximate area of the site (i.e., acres or sq. ft): The three sites occupy a combined area of approximately 3 acres

2. Provide an approximate breakdown of the land uses on the site:

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	_____% Undisturbed	100% Other[c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, etc.):
_____

[b]For agricultural areas, please list the crops and/or livestock which are present:
_____

[c]For areas designated as "other", please describe the usage of the area:

Buildings 920, 921, and 922 were constructed in 1959 for ammunition assembly, primarily for bolting rocket components together before use. All three 1,900 square foot buildings are vacant and empty. The Septic Tanks Report (included in Appendix A of the RFI) indicates that each building contained a toilet and a lavatory which discharged to the sewer system. All three septic tanks were abandoned in place in January 2008 by opening each tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill (North Wind Inc., 2008, also included in Appendix A of the RFI).

3. Provide an approximate breakdown of the land uses in the area surrounding the site. Indicate the radius (in miles) of the area described: approximately 0.5 mile

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	~50 % Undisturbed	~50 % Other [c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, golf course, etc.):

---

[b]For agricultural areas, please list the crops and/or livestock which are present:

---

[c]For areas designated as "other", please describe the usage of the area:
Habitat Map for Holloman AFB (attached Figure 1) shows that habitat within 0.5 mile radius contains approximately 50 percent classified as "Development/Ground Disturbance."

4. Describe reasonable and likely future land and/or water use(s) at the site.
Land use is likely to remain the same.

5. Describe the historical uses of the site. Include information on chemical releases that may have occurred as a result of previous land uses. For each chemical release, provide information on the form of the chemical released (i.e., solid, liquid, vapor) and the known or suspected causes or mechanism of the release (i.e., spills, leaks, material disposal, dumping, explosion, etc.).

Buildings 920, 921, and 922 were constructed in 1959 for ammunition assembly, primarily for bolting rocket components together before use. All three 1,900 square foot buildings are vacant and empty. The Septic Tanks Report (included in Appendix A of the RFI) indicates that each building contained a toilet and a lavatory which discharged to the sewer system. Except for releases associated with the septic systems and leach fields, no chemical releases are known to have occurred at the sites.

6. If any movement of soil has taken place at the site, describe the degree of the disturbance. Indicate the likely source of any disturbances (e.g., erosion, agricultural, mining, industrial activities, removals, etc.) and estimate when these events occurred.

Site disturbances of soil have been limited to excavation activities associated with building construction and septic system installation.

7. Describe the current uses of the site. Include information on recent (previous 5 years) disturbances or chemical releases that have occurred. For each chemical release, provide information on the form of the chemical released and the causes or mechanism of the release.

Buildings 920, 921, and 922 were constructed in 1959 for ammunition assembly, primarily for bolting rocket components together before use. All three 1,900 square foot buildings are vacant and empty. Current site usage is the same.

8. Identify the location or suspected location of chemical releases at the site. Provide an estimate of the distance between these locations and the areas identified in Section III.

Chemical releases that may have occurred are associated with septic system leakage.

9. Identify the suspected contaminants of concern (COCs) at the site. If known, include the maximum contaminant levels. Please indicate the source of data cited (e.g., RFI, confirmatory sampling, etc.).

Building 920 (OT-C531A) - Detected constituents from soil samples collected include several metals and three SVOCs. Additionally, samples were analyzed for VOCs, explosives, TPH (gasoline, diesel, and oil range organics), PCBs, cyanide; and tritium; however, all were non-detect in soil samples from the site (for 0 to 10 feet bgs, the zone of interest for ecological receptors).

Building 921 (OT-C531B) - Detected constituents from soil samples collected include several metals and three VOCs. Additionally, samples were analyzed for SVOCs, explosives, TPH (gasoline, diesel, and oil range organics), PCBs, cyanide; and tritium; however, all were non-detect in soil samples from the site (for 0 to 10 feet bgs, the zone of interest for ecological receptors).

Building 922 (OT-C531C) - Detected constituents from soil samples collected include several metals and one VOCs. Additionally, samples were analyzed for SVOCs, explosives, TPH (gasoline, diesel, and oil range organics), PCBs, cyanide; and tritium; however, all were non-detect in soil samples from the site (for 0 to 10 feet bgs, the zone of interest for ecological receptors).

10. Identify the media (e.g., soil (surface or subsurface), surface water, air, groundwater) which are known or suspected to contain COCs. _____
Surface and subsurface soil and potentially groundwater

11. Indicate the approximate depth to groundwater (in feet below ground surface [(bgs)].

Groundwater was investigated at Buildings 920, 921 and 922 former septic tank locations. Depth to groundwater ranged from 12.8 feet below top of PVC casing at Building 921 (in Monitoring Well OTC531B-MW01 to 15.9 feet below top of PVC casing at Building 920 (in Monitoring Well OTC531A-MW01).

12. Indicate the direction of groundwater flow (e.g., north, southeast, etc.)

According to Figure 2-3 of the RFI report, the direction of groundwater flow at Holloman AFB has been shown to be generally from northeast to southwest. According to this figure, groundwater flow direction in the vicinity of Buildings 920, 921, and 922 is to the southwest.

III. HABITAT EVALUATION

III.A Wetland Habitats

Are any wetland[1] areas such as marshes or swamps on or adjacent to the site?

☐ Yes X No

If yes, indicate the wetland area on the attached site map and answer the following questions regarding the wetland area. If more than one wetland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wetland area. Distinguish between wetland areas by using names or other designations (such as location), and clearly identify each area on the site map. Also, obtain and attach a National Wetlands Inventory Map (or maps) to illustrate each wetland area.

Identify the sources of the observations and information (e.g., National Wetland Inventory, Federal or State Agency, USGS topographic maps) used to make the determination that wetland areas are or are not present.

The Integrated Natural Resource Management Plan for Holloman AFB (HAFB, 2011) and site observations.

If no wetland areas are present, proceed to Section III.B.

1Wetlands are defined in 40 CFR §232.2 as " Areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Examples of typical wetlands plants include: cattails, cordgrass, willows and cypress trees. National wetland inventory maps may be available at http:\\nwi.fws.gov. Additional information on wetland delineation criteria is also available from the Army Corps of Engineers.

Wetland Area Questions

☐ Onsite ☐ Offsite

Name or
Designation:_____

1. Indicate the approximate area of the wetland (acres or ft^2)_____

2. Identify the type(s) of vegetation present in the wetland.

   - ❑ Submergent (i.e., underwater) vegetation
   - ❑ Emergent (i.e., rooted in the water, but rising above it) vegetation
   - ❑ Floating vegetation
   - ❑ Scrub/shrub
   - ❑ Wooded
   - ❑ Other (Please describe):_____

3. Estimate the vegetation density of the wetland area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Is standing water present? ☐ Yes ☐ No

   If yes, is the water primarily: ☐ Fresh or ☐ Brackish
   Indicate the approximate area of the standing water (ft^2): _____
   Indicate the approximate depth of the standing water, if known (ft. or in.)_____

5. If known, indicate the source of the water in the wetland.

   - ❑ Stream/River/Creek/Lake/Pond
   - ❑ Flooding
   - ❑ Groundwater
   - ❑ Surface runoff

6. Is there a discharge from the facility to the wetland? ☐ Yes ☐ No

   If yes, please
   describe:_____
   _____
   _____
   _____
   _____

Wetland Area Questions (Continued)

7. Is there a discharge from the wetland? ☐ Yes ☐ No
   If yes, indicate the type of aquatic feature the wetland discharges into:

   - ❑ Surface stream/River (Name:_____)
   - ❑ Lake/Pond (Name:_____)
   - ❑ Groundwater
   - ❑ Not sure

8. Does the area show evidence of flooding? ☐ Yes ☐ No
   If yes, indicate which of the following are present (mark all that apply):

   - ❑ Standing water
   - ❑ Water-saturated soils
   - ❑ Water marks
   - ❑ Buttressing
   - ❑ Debris lines
   - ❑ Mud cracks
   - ❑ Other (Please describe):_____

9. Animals observed in the wetland area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:
   _____
   _____
   _____
   _____

III.B Aquatic Habitats

III.B.1 Non-Flowing Aquatic Features

Are any non-flowing aquatic features (such as ponds or lakes) located at or adjacent to the site?

☐ Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the non-flowing aquatic features. If more than one non-flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.B.2.

Non-Flowing Aquatic Feature Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Indicate the type of aquatic feature present:

   - ❑ Natural (e.g., pond or lake)
   - ❑ Man-made (e.g., impoundment, lagoon, canal, etc.)

2. Estimate the approximate size of the water body (in acres or sq. ft.)_____

3. If known, indicate the depth of the water body (in ft. or in.)._____

4. **Non-Flowing Aquatic Feature Questions (Continued)**

5. Indicate the general composition of the bottom substrate. Mark all sources that apply from the following list.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

☐ Other (please specify):_____

6. Indicate the source(s) of the water in the aquatic feature. Mark all sources that apply from the following list.

- ❑ River/Stream/Creek
- ❑ Groundwater
- ❑ Industrial Discharge
- ❑ Surface Runoff
- ❑ Other (please specify):_____

7. Is there a discharge from the facility to the aquatic feature? ☐ Yes ☐ No
   If yes, describe the origin of each discharge and its migration path:
   _____
   _____
   _____
   _____

8. Does the aquatic feature discharge to the surrounding environment? ☐ Yes ☐ No
   If yes, indicate the features from the following list into which the aquatic feature discharges, and indicate whether the discharge occurs onsite or offsite:

❑ River/Stream/Creek	☐ onsite	☐ offsite
❑ Groundwater	☐ onsite	☐ offsite
❑ Wetland	☐ onsite	☐ offsite
❑ Impoundment	☐ onsite	☐ offsite

❑ Other (please describe)_____

Non-Flowing Aquatic Feature Questions (Continued)

9. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Fish
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, turtles)
- ❑ Amphibians (e.g., frogs, salamanders)
- ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

Specify species, if known:

_____
_____
_____
_____

III.B.2 Flowing Aquatic Features

Are any flowing aquatic features (such as streams or rivers) located at or adjacent to the site?

☐ Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the flowing aquatic features. If more than one flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map

If no, proceed to Section III.C.

Flowing Aquatic Feature Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Indicate the type of flowing aquatic feature present.

   - ❑ River
   - ❑ Stream
   - ❑ Creek
   - ❑ Brook
   - ❑ Dry wash
   - ❑ Arroyo
   - ❑ Intermittent stream
   - ❑ Artificially created (ditch, etc.)
   - ❑ Other (specify)
   - ❑

2. Indicate the general composition of the bottom substrate.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

   ☐ Other (please specify):_____

3. Describe the condition of the bank (e.g., height, slope, extent of vegetative cover) of the aquatic feature.

   _____
   _____
   _____
   _____

4. Is there a discharge from the facility to the aquatic feature? ☐ Yes ☐ No
   If yes, describe the origin of each discharge and its migration path:

   _____
   _____
   _____
   _____

5. Indicate the discharge point of the water body. Specify name, if known.

   _____
   _____
   _____

Flowing Aquatic Feature Questions (Continued)

6. If the flowing aquatic feature is a dry wash or arroyo, answer the following questions.
   - ❑ Check here if feature is not a dry wash or arroyo

   If known, specify the average number of days in a year in which flowing water is present in the feature: _____

   Is standing water or mud present? Check all that apply.
   - ❑ Standing water
   - ❑ Mud
   - ❑ Neither standing water or mud

   Does the area show evidence of recent flow (e.g., flood debris clinging to vegetation)?
   - ❑ Yes
   - ❑ No
   - ❑ Not sure
7. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:

   _____
   _____
   _____
   _____

III.C Terrestrial Habitats

III.C.1 Wooded

Are any wooded areas on or adjacent to the site? ☐ Yes X No

If yes, indicate the wooded area on the attached site map and answer the following questions. If more than one wooded area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wooded area. Distinguish between wooded areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.2.

Wooded Area Questions

☐ On-site ☐ Off-site

Name or Designation:_____

1. Estimate the approximate size of the wooded area (in acres or sq. ft.)

2. Indicate the dominant type of vegetation in the wooded area.

   - ❑ Evergreen
   - ❑ Deciduous
   - ❑ Mixed

Dominant plant species, if known:_____

3. Estimate the vegetation density of the wooded area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the predominant size of the trees at the site. Use diameter at chest height.

   - ❑ 0-6 inches
   - ❑ 6-12 inches
   - ❑ >12 inches
   - ❑ No single size range is predominant

5. Animals observed in the wooded area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:_____

III.C.2 Shrub/Scrub

Are any shrub/scrub areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the shrub/scrub area on the attached site map and answer the following questions. If more than one shrub/scrub area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual shrub/scrub area. Distinguish between shrub/scrub areas, using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.3.

Shrub/Scrub Area Questions

X Onsite X Offsite

Name or Designation: Chihuahuan Desert Scrub (HAFB, 2011).
Note also: On-site areas are almost entirely gravel covered and void of habitat or vegetation with some apparent pockets of desert vegetation. Surrounding site habitat is characterized as Chihuahuan Desert. The habitat map (Figure 1) shows that habitat surrounding the site is dominated by alkali sacaton grassland habitat.

1. Estimate the approximate size of the shrub/scrub area (in acres or sq. ft.).
   Surrounding HAFB are tens of thousands of acres of Chihuahuan Desert Scrub.

2. Indicate the dominant type of shrub/scrub vegetation present, if known.

According to information provided in Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011), the area around Buildings 920, 921, and 922 (OT-C531A, B, and C) is dominated by Alkali Sacaton Grassland.

3. Estimate the vegetation density of the shrub/scrub area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - X Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the scrub/shrub vegetation.

   - ❑ 0-2 feet
   - X 2-5 feet
   - ❑ >5 feet

5. Animals observed in the shrub/scrub area or suspected to be present based on indirect evidence or file material:
   - X Birds
   - X Mammals
   - X Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:
   The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna associated with the shrubland habitat potentially present in the area of Buildings 920, 921, and 922. Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the*

Merriam kangaroo rat (*Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.3 Grassland

Are any grassland areas on or adjacent to the site? ☐ Yes X No

If yes, indicate the grassland area on the attached site map and answer the following questions. If more than one grassland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual grassland area. Distinguish between grassland areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.4.

Grassland Area Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Estimate the approximate size of the grassland area (in acres or sq. ft.)._____

2. Indicate the dominant plant type, if known.
_____
_____
_____
_____

3. Estimate the vegetation density of the grassland area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the dominant plant type (in ft. or in.)_

5. Animals observed in the grassland area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:

III.C.4 Desert

Are any desert areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the desert area on the attached site map and answer the following questions. If more than one desert area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual desert area. Distinguish between desert areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.5.

Desert Area Questions

X Onsite ☐ Offsite
Name or Designation: Chihuahuan Desert

1. Estimate the approximate size of the desert area (in acres or sq. ft.). This site including HAFB is contained within tens of thousands of acres of the Chihuahuan Desert.

2. Describe the desert area (e.g., presence or absence of vegetation, vegetation types, presence/size of rocks, sand, etc.)
Many volumes of literature have been written on the natural biota of the Chihuahuan Desert. Detailed descriptions about the biotic communities within HAFB can be found in the HAFB Integrated Natural Resource Management Plan, (HAFB, 2011). Habitats directly associated with this Site include typical desert scrub communities.

3. Animals observed in the desert area or suspected to be present based on indirect evidence or file material:

X Birds
X Mammals
X Reptiles (e.g., snakes, lizards)
☐ Amphibians (e.g., toads, salamanders)

Specify species, if known:

The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna associated with the shrubland habitat potentially present in the area of Buildings 920, 921, and 922. Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the*

Merriam kangaroo rat (*Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.5 Other

1. Are there any other terrestrial communities or habitats on or adjacent to the site which were not previously described?

☐ Yes X No

If yes, indicate the "other" area(s) on the attached site map and describe the area(s) below. Distinguish between onsite and offsite areas. If no, proceed to Section III.D.

III.D Sensitive Environments and Receptors

1. Do any other potentially sensitive environmental areas[2] exist adjacent to or within 0.5 miles of the site? If yes, list these areas and provide the source(s) of information used to identify sensitive areas. *Do not answer "no" without confirmation from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

The following is taken from the Integrated Natural Resources Management Plan for HAFB (HAFB,2011). HAFB and its Geographically Separated Units (GSUs) have high biodiversity, including many sensitive species. No threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The White Sands pupfish is not Federally-listed nor has critical habitat been designated because of the multi-agency cooperative agreement to manage the species to support viable populations through habitat management and research.

Most of the sensitive species are birds that are either associated with grassland habitats on main base or with wetland habitats, primarily in the Lake Holloman Public Access Area wetlands complex south of the Cantonment. Sensitive grassland and desert species at HAFB that are discussed in further detail in the management plan include:

- White Sands pupfish

2 Areas that provide unique and often protected habitat for wildlife species. These areas are typically used during critical life stages such as breeding, hatching, rearing of young and overwintering. Refer to **Table 1** at the end of this document for examples of sensitive environments.

- Acarospora clauzadeana lichen
- Grassland neotropical migratory birds
- Western burrowing owl
- Aplomado falcon
- Grassland raptors
- Bats
- Texas horned lizard and other reptiles

2. Are any areas on or near (i.e., within 0.5 miles) the site which are owned or used by local tribes? If yes, describe. *Contact the Tribal Liason in the Office of the Secretary (505)827-2855 to obtain this information.*

No

3. Does the site serve or potentially serve as a habitat, foraging area, or refuge by rare, threatened, endangered, candidate and/or proposed species (plants or animals), or any otherwise protected species? If yes, identify species. *This information should be obtained from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

No, based on information in the Integrated Natural Resources Management Plan, no threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The plan establishes protocols for management of sensitive desert and grassland habitats.

4. Is the site potentially used as a breeding, roosting or feeding area by migratory bird species? If yes, identify which species.

Likely not. The site has very limited viable habitat due to the disturbed nature of the site, but areas surrounding the site could potentially provide habitat for these purposes.

5. Is the site used by any ecologically[3], recreationally, or commercially important species? If yes, explain.

No

IV. EXPOSURE PATHWAY EVALUATION

1. Do existing data provide sufficient information on the nature, rate, and extent of

3 Ecologically important species include populations of species which provide a critical (i.e., not replaceable) food resource for higher organisms and whose function as such would not be replaced by more tolerant species; or perform a critical ecological function (such as organic matter decomposition) and whose functions will not be replaced by other species. Ecologically important species include pest and opportunistic species that populate an area if they serve as a food source for other species, but do not include domesticated animals (e.g., pets and livestock) or plants/animals whose existence is maintained by continuous human interventions (e.g., fish hatcheries, agricultural crops, etc.,)

contamination at the site?

X Yes
❑ No
❑ Uncertain

Please provide an explanation for your answer: Sample results have sufficiently characterized the site.

2. Do existing data provide sufficient information on the nature, rate, and extent of contamination in offsite affected areas?

□ Yes
❑ No
❑ Uncertain
X No offsite contamination

Please provide an explanation for your answer:_____
No offsite contamination is expected, and no off-site soil or groundwater samples were collected.

3. Do existing data address potential migration pathways of contaminants at the site?

X Yes
❑ No
❑ Uncertain

Please provide an explanation for your answer

While potential migration from impacted soils to groundwater might occur, ecological receptors are not expected to contact groundwater.

4. Do existing data address potential migration pathways of contaminants in offsite affected areas?

X Yes
❑ No
❑ Uncertain
❑ No offsite contamination

Please provide an explanation for your answer:

See response to No. 3 presented previously. Also, no off-site soil contamination is expected.

5. Are there visible indications of stressed habitats or receptors on or near (i.e., within 0.5 miles) the site that may be the result of a chemical release? If yes, explain. Attach photographs if available.

No.

6. Is the location of the contamination such that receptors might be reasonably expected to come into contact with it? For soil, this means contamination in the soil 0 to 5 feet below ground surface (bgs). If yes, explain.

Yes. Some soil samples were collected in site areas where receptors might contact detected constituents.

7. Are receptors located in or using habitats where chemicals exist in air, soil, sediment or surface water? If yes, explain.

Yes. See response to No. 6 presented above.

8. Could chemicals reach receptors via groundwater? Can chemicals leach or dissolve to groundwater? Are chemicals mobile in groundwater? Does groundwater discharge into receptor habitats? If yes, explain.

No. Ecological receptors are not expected to have contact with groundwater.

9. Could chemicals reach receptors through runoff or erosion? Answer the following questions:

What is the approximate distance from the contaminated area to the nearest watercourse or arroyo?

- ❑ 0 feet (i.e., contamination has reached a watercourse or arroyo)
- ❑ 1-10 feet
- ❑ 11-20 feet
- ❑ 21-50 feet
- ❑ 51-100 feet
- ❑ 101-200 feet
- ❑ > 200 feet
- ❑ > 500 feet
- X > 1000 feet

What is the slope of the ground in the contaminated area?

- X 0-10%
- ❑ 10-30%
- ❑ > 30%

What is the approximate amount of ground and canopy vegetative cover in the contaminated area?

- ❑ < 25%
- X 25-75%
- ❑ > 75%

Is there visible evidence of erosion (e.g., a rill or gully) in or near the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

Do any structures, pavement, or natural drainage features direct run-on flow (i.e., surface flows originating upstream or uphill from the area of concern) into the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

10. Could chemicals reach receptors through the dispersion of contaminants in air (e.g., volatilization, vapors, fugitive dust)? If yes, explain.

Yes. However, detected concentrations of constituents in soil do not generally exceeding relevant background values or ecological screening criteria (see screening assessment in main text).

11. Could chemicals reach receptors through migration of non-aqueous phase liquids (NAPLs)? Is a NAPL present at the site that might be migrating towards receptors or habitats? Could NAPL discharge contact receptors or their habitat?

No NAPLs are present at the site.

12. Could receptors be impacted by external irradiation at the site? Are gamma emitting radionuclides present at the site? Is the radionuclide contamination buried or at the surface?

No. No radionuclide contamination is expected to be present at the site.

PHOTOGRAPHIC DOCUMENTATION

During the site visit(s), photographs should be taken to document the current conditions at the site and to support the information entered in the checklist. For example, photographs may be used to document the following:

- The nature, quality, and distribution of vegetation at the site
- Receptors or evidence of receptors
- Potentially important ecological features, such as ponds and drainage ditches
- Potential exposure pathways
- Any evidence of contamination or impact

SUMMARY OF OBSERVATIONS AND SITE SETTING

Include information on significant source areas and migration pathways that are likely to constitute complete exposure pathways.

Although potentially complete exposure pathways exist (e.g. direct contact with surface soil), significant source areas are not present, as results of the screening assessment (see main text) indicate that detected concentrations of constituents in soil do not generally exceeding relevant ecological screening criteria.

Checklist Completed by Mark Hardner

Affiliation CB&I Federal Services, LLC.

Author Assisted by William Stanhope, CB&I Federal Services, LLC.

Date August 7, 2013

Buildings 920, 921, and 922 locations

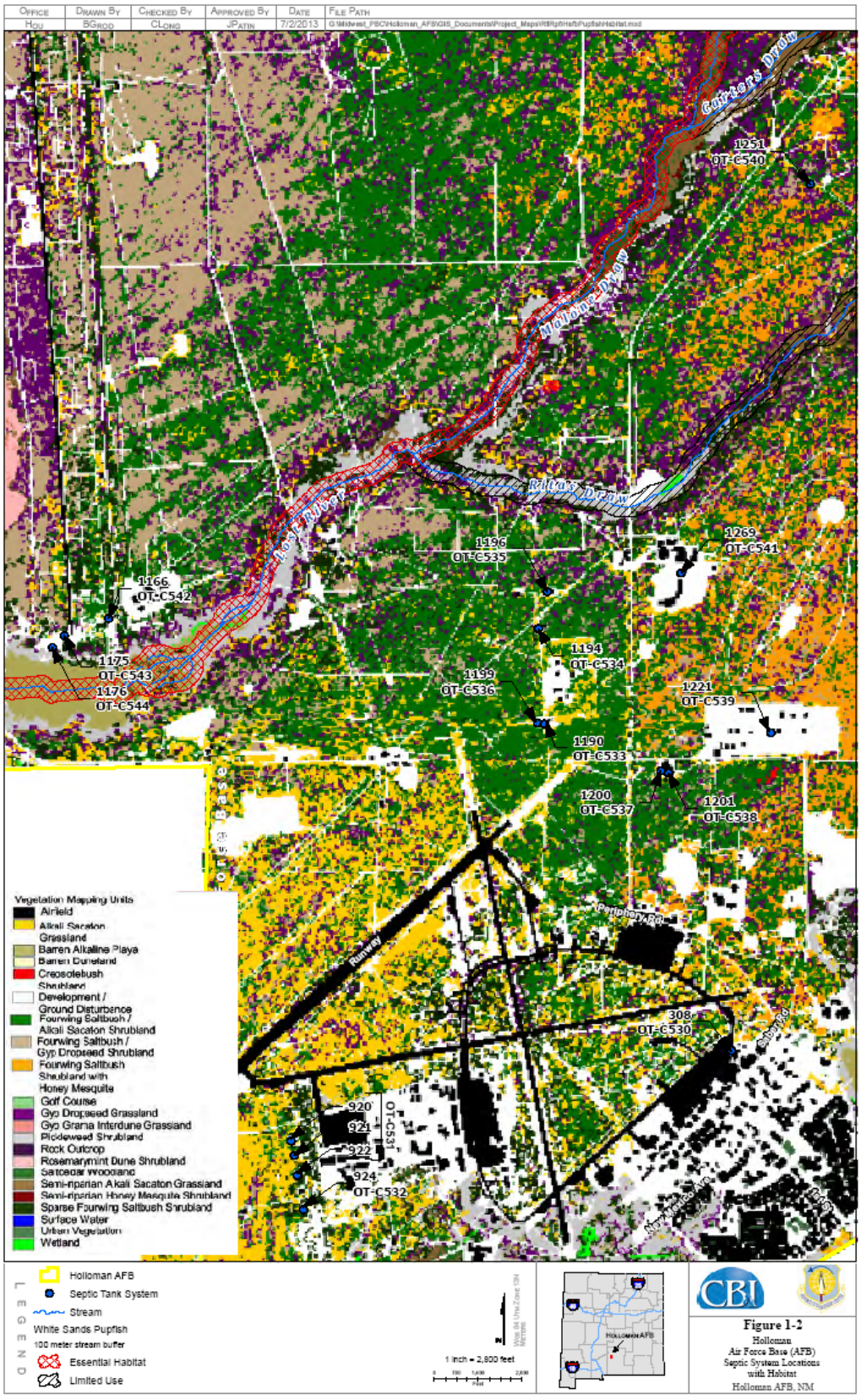

Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
with Habitat
Holloman AFB, NM

REFERENCES

Holloman Air Force Base (HAFB), 2011. *Integrated Natural Resource Management Plan*, February.

Holloman Air Force Base (HAFB), 2007. *Holloman Air Force Base Septic Tanks*, April.

New Mexico Environment Department (NMED), 2012. *Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document*, Hazardous Waste Bureau and Ground Water Quality Bureau, February, Table A-1 updated June 2012.

North Wind, Inc., 2008. *Technical Memorandum Summarizing Decommissioning Work Conducted on Inactive Septic Tanks at Holloman AFB*, March.

TABLE 1
EXAMPLES OF SENSITIVE ENVIRONMENTS

National Parks and National Monuments

Designated or Administratively Proposed Federal Wilderness Areas

National Preserves

National or State Wildlife Refuges

National Lakeshore Recreational Areas

Federal land designated for protection of natural ecosystems

State land designated for wildlife or game management

State designated Natural Areas

Federal or state designated Scenic or Wild River

All areas that provide or could potentially provide critical habitat[1] for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern

All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes

All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)

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1 Critical habitats are defined by the Endangered Species Act (50 CFR §424.02(d)) as:

> 1) Specific areas within the geographical area currently occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (ii) that may require special management considerations or protection, and 2) Specific areas outside the geographical area occupied by a species at the time it is listed upon a determination by the Secretary [of Interior] that such areas are essential for the conservation of the species.

All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)

All areas that provide or could potentially provide habitat for song birds as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-13)

All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)

All areas that provide or could potentially provide habitat for horned toads and Bullfrogs as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, resp.)

All perennial waters (e.g., rivers, lakes, playas, sloughs, ponds, etc)

All ephemeral drainage (e.g., arroyos, puddles/pools, intermittent streams, etc) that provide significant wildlife habitat or that could potentially transport contaminants off site to areas that provide wildlife habitat

All riparian habitats

All perennial and ephemeral wetlands (not limited to jurisdictional wetlands)

All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle.

ATTACHMENT B

ECOLOGICAL SITE EXCLUSION CRITERIA CHECKLIST AND DECISION TREE

1. NEW MEXICO ECOLOGICAL EXCLUSION CRITERIA CHECKLIST

The following questions are designed to be used in conjunction with the Ecological Exclusion Criteria Decision Tree (Figure 1). After answering each question, refer to the Decision Tree to determine the appropriate next step. In some cases, questions will be omitted as the user is directed to another section as indicated by the flow diagram in the Decision Tree. For example, if the user answers "yes" to Question 1 of Section I, he or she is directed to proceed to Section II.

I. Habitat

In the following questions, "affected property" refers to all property on which a release has occurred or is believed to have occurred, including off-site areas where contamination may have occurred or migrated.

1. Are any of the below-listed sensitive environments at, adjacent to, or in the locality1 of the affected property?

   - National Park or National Monument
   - Designated or administratively proposed Federal Wilderness Area
   - National Preserve
   - National or State Wildlife Refuge
   - Federal or State land designated for wildlife or game management
   - State designated Natural Areas
   - All areas that are owned or used by local tribes
   - All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle
   - All areas that provide or could potentially provide habitat for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern
   - All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes
   - All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)
   - All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)
   - All areas that provide or could potentially provide habitat for song birds as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game

1 *Locality* of the site refers to any area where an ecological receptor is likely to contact site-related chemicals. The locality of the site considers the likelihood of contamination migrating over time and places the site in the context of its general surrounding. Therefore, the locality is typically larger than the site and the areas adjacent to the site.

and Fish, 17-2-13)

- All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)
- All areas that provide or could potentially provide habitat for horned toads and bullfrogs as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, respectively)

2. Does the affected property contain land areas which were not listed in Question 1, but could be considered viable ecological habitat? The following are examples (but not a complete listing) of viable ecological habitats:

- Wooded areas
- Shrub/scrub vegetated areas
- Open fields (prairie)
- Other grassy areas
- Desert areas
- Any other areas which support wildlife and/or vegetation, excluding areas which support only opportunistic species (such as house mice, Norway rats, pigeons, etc.) that do not serve as prey to species in adjacent habitats.

The following features are <u>not</u> considered ecologically viable:

- Pavement
- Buildings
- Paved areas of roadways
- Paved/concrete equipment storage pads
- Paved manufacturing or process areas
- Other non-natural surface cover or structure

3. Does the affected property contain any perennial or ephemeral aquatic features which were not listed in Question 1?

II. Receptors

1. Is any part of the affected property used for habitat, foraging area, or refuge by any rare, threatened, or endangered species (plant *or* animal), or otherwise protected species (e.g., raptors, migratory birds)?

2. Is any part of the affected property used for habitat, foraging area, or refuge by any species used as a recreational (e.g., game animals) and/or commercial resource?

3. Is any part of the affected property used for habitat, foraging area, or refuge by any plant or animal species? This includes plants considered "weeds" and opportunistic insect and animal species (such as cockroaches and rats) if they are used as a food source for other species in the area.

III. Exposure Pathways

1. Could receptors be impacted by contaminants via direct contact?

   Is a receptor located in or using an area where it could contact contaminated air, soil[3], or surface water?

For Questions 2 and 3, note that one must answer "yes" to all three bullets in order to be directed to the "exclusion denied" box of the decision tree. This is because answering "no" to one of the questions in the bullet list indicates that a complete exposure pathway is not present. For example, in Question 2, if the chemical cannot leach or dissolve to groundwater (bullet 1), there is no chance of ecological receptors being exposed to the chemical through contact with contaminated groundwater. Similarly, the responses to the questions in Question 4 determine whether a complete pathway exists for exposure to NAPL.

2. Could receptors contact contaminants via groundwater?
   - Can the chemical leach or dissolve to groundwater[4]?
   - Can groundwater mobilize the chemical?
   - Could (does) contaminated groundwater discharge into known or potential receptor habitats?

3. Could receptors contact contaminants via runoff (i.e., surface water and/or suspended sediment) or erosion by water or wind?
   - Are chemicals present in surface soils?
   - Can the chemical be leached from or eroded with surface soils?
   - Is there a receptor habitat located downgradient of the leached/eroded surface soil?

---

3 For soil, this means contamination less than 5 feet below ground surface (bgs).

4 Information on the environmental fate of specific chemicals can be found on the Internet at *http://www.epa.gov/opptintr/chemfact/* or at a local library in published copies of the *Hazardous Substances Data Bank*.

4. Could receptors contact contaminants via migration of non-aqueous phase liquids (NAPL)?

- Is NAPL present at the site?
- Is NAPL migrating toward potential receptors or habitats?
- Could NAPL discharge impact receptors or habitats?

Figure 1 -Ecological Exclusion Criteria Decision Tree

(Refer to corresponding checklist for the full text of each question)

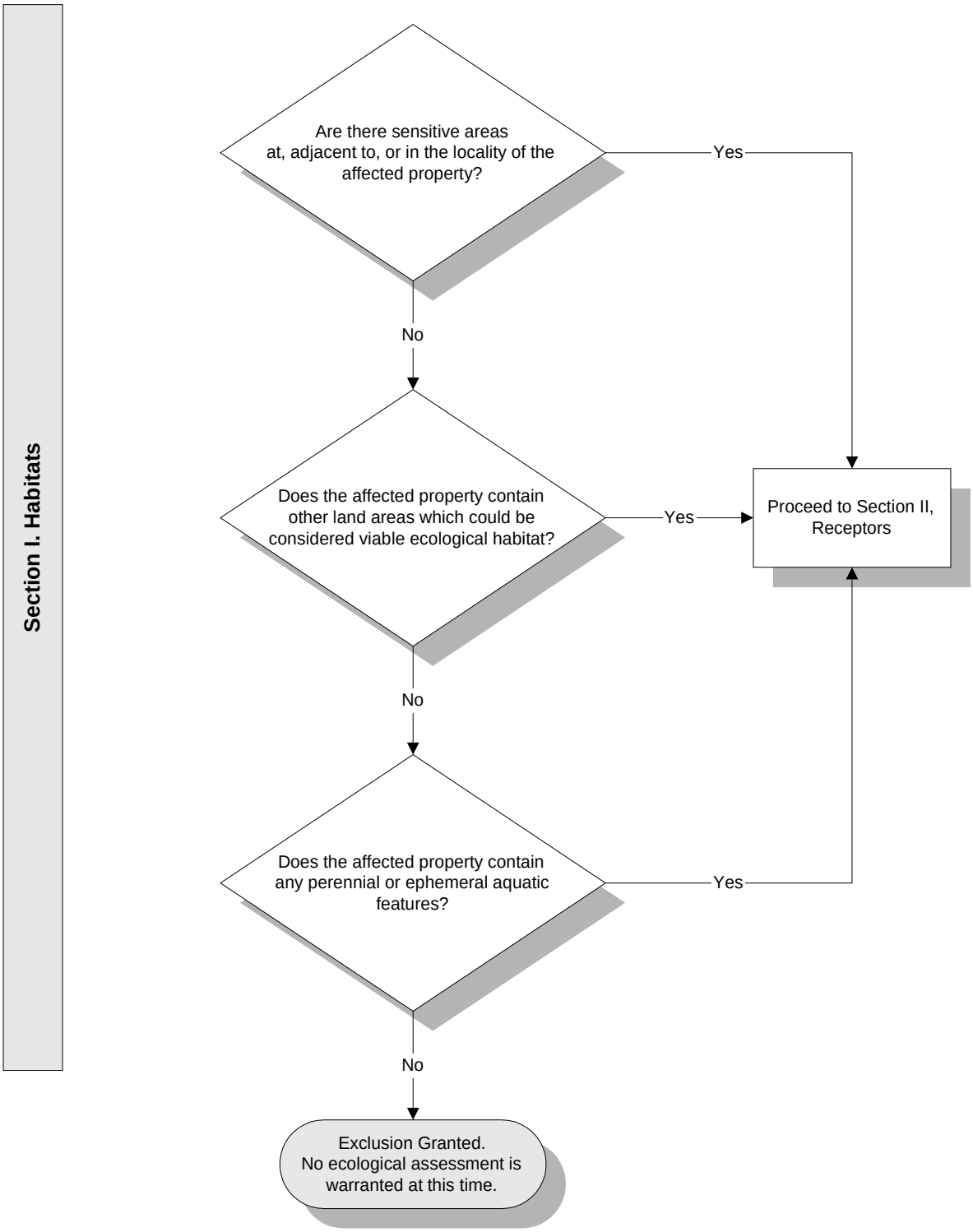

Figure 1 - Exclusion Criteria Decision Tree (continued)

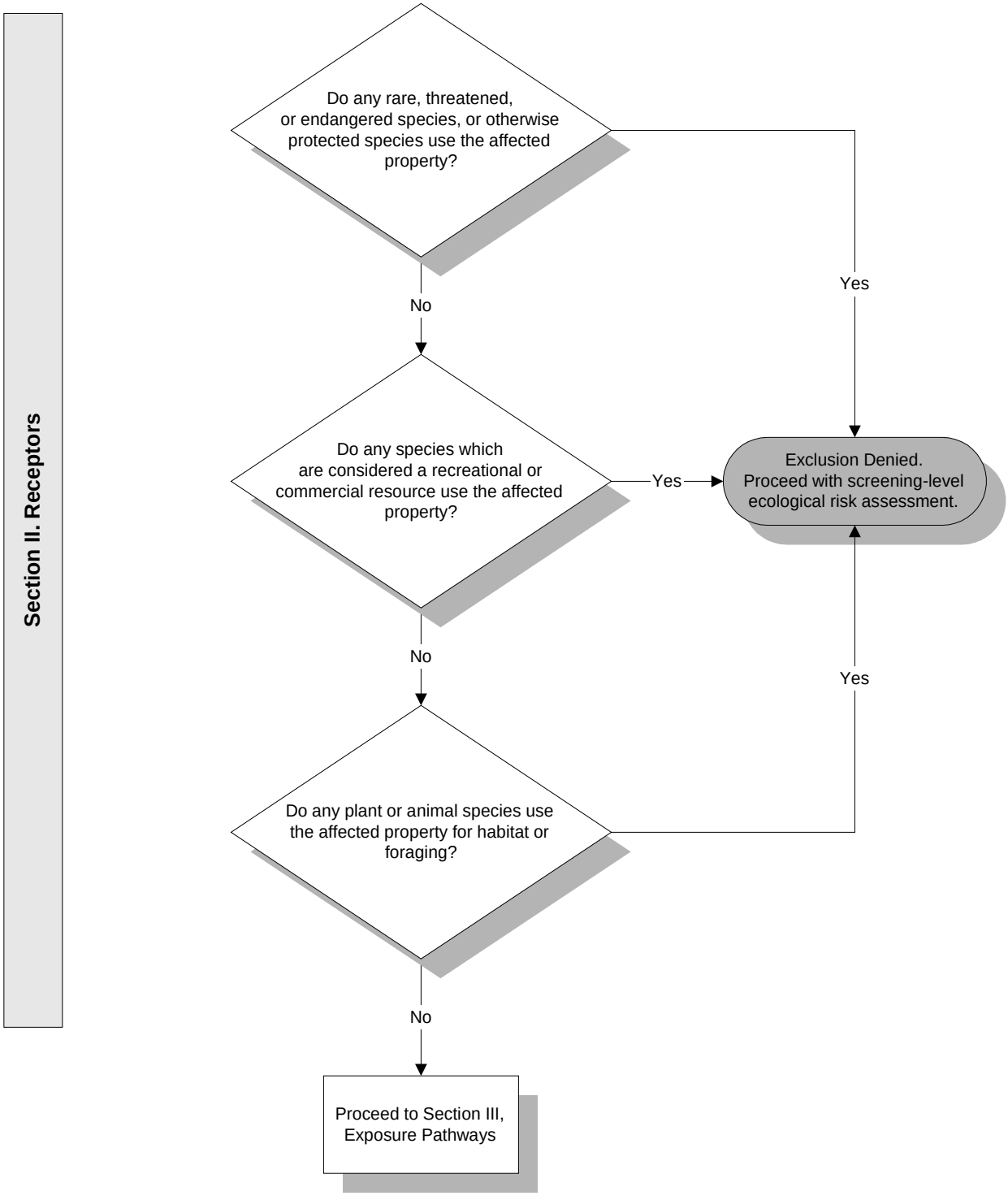

Figure 1 - Exclusion Criteria Decision Tree (continued)

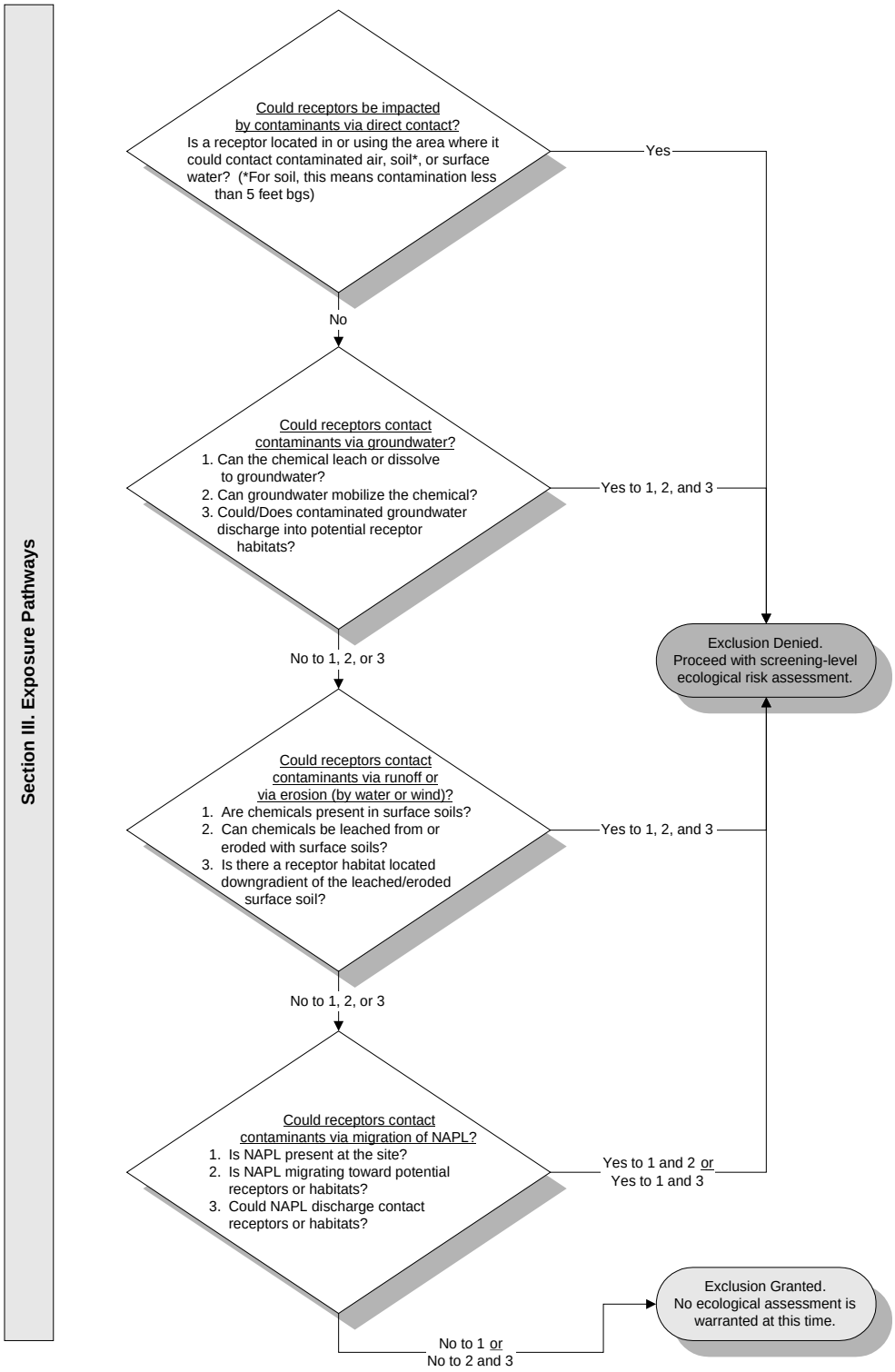

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

Analyte		Sample Number	OTC531A-IS-0001-071012		OTC531A-IS-0003-071012		OTC531A-IS-0004-071012-FD		OTC531A-IS-0006-071012		OTC531A-IS-0008-071012		OTC531A-IS-0010-071012	
		Sample Date	7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012		7/10/2012	
		Location	Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01	
		Depth (ft bgs)	3 - 5		7 - 9		7 - 9		3 - 5		3 - 5		0 - 2	
	Background Values - Soil (mg/kg)[a]	LANL (2012) ESLs (mg/kg)[b]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	**87.9**		**86.5**		**85.7**		**85.9**		**86.5**		**85.7**	
SEMIVOLATILES (mg/kg)														
2-METHYLNAPHTHALENE	NE	16 / 160	0.019	U	**0.0814**	J	0.02	U	0.02	U	0.019	U	0.02	U
CAPROLACTAM	NE	NSV	0.061	U	**0.0687**	J	0.063	U	0.063	U	0.062	U	0.063	U
NAPHTHALENE	NE	1 / 10	0.03	U	**0.0318**	J	0.032	U	0.032	U	0.031	U	0.031	U
METALS (mg/kg)														
ALUMINUM	13722	pH Dependent	**5260**		**2250**		**2880**		**1090**		**1280**		**5740**	
ARSENIC	3.7	6.8 / 68	**1.5**	J	0.97	U	1.1	U	1	U	1.1	U	**1.3**	J
BARIUM	169	110 / 260	**66.2**	J	**24.6**	J	**33.4**	J	**27.8**	J	**12.7**	J	**37.2**	J
CALCIUM	317332	NSV	**141000**		**219000**		**222000**		**209000**		**224000**		**160000**	
CHROMIUM	25	28 / 280	**4.6**	J	**1.7**	J	**2.6**	J	**0.69**	J	**1.7**	J	**5.1**	
COBALT	7.7	13 / 130	**1.7**	J	**0.88**	J	**1**	J	0.52	U	0.57	U	**2**	J
COPPER	13	15 / 46	**2.8**	J	**2.2**	J	**2.6**	J	**2.1**	J	**1.1**	J	**4.7**	J
IRON	23049	NSV	**4830**		**1980**		**2440**		**836**		**1150**		**4590**	
LEAD	10.9	14 / 28	**2.3**	J	**1.1**	J	**0.67**	J	0.52	U	0.57	U	**2**	J
MAGNESIUM	16991	NSV	**1870**	J	**2150**	J	**2380**	J	**970**	J	**971**	J	**6810**	
MANGANESE	393	220 / 1,100	**76**		**36.4**		**46.7**		**15.3**		**19.8**		**121**	
NICKEL	17.4	9.7 / 19	**3.7**	J	**1.7**	J	**2.2**	J	**0.8**	J	0.01	U	**4.1**	J
POTASSIUM	5077	NSV	**1700**	J	**657**	J	**1270**	J	**534**	J	0.01	U	**1820**	J
SODIUM	5196	NSV	**920**	J	**837**	J	**1290**	J	**1480**	J	0.01	U	**3530**	J
VANADIUM	42.6	0.025 / 0.25	**12.1**	J	**5.6**	J	**6.2**	J	**2.3**	J	**2.4**	J	**9.6**	J
ZINC	54.6	48 / 480	**12.3**		**8.9**	J	**6.6**	J	2.6	U	2.9	U	**14.2**	

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 920 (OT-C531A) RFI Report
Holloman Air Force Base, New Mexico

LANL (2012) ESL values represented as: No-Effect ESL / Low-Effect ESL (e.g., 6.8 / 68 for arsenic)

LANL (2012) ESL Exceeded

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] Los Alamos National Laboratory (LANL), 2012, ECORISK Database, LA-UR-12-24548, Release 3.1, October.

dup = duplicate sample
EPA = U.S. Environmental Protection Agency
FD = field duplicate
ft bgs = feet below ground surface
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Table B
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

Analyte		Sample Number	OTC531B-IS-0001-071112		OTC531B-IS-0003-071112		OTC531B-IS-0004-071112-FD		OTC531B-IS-0006-071112		OTC531B-IS-0008-071112		OTC531B-IS-0010-071112	
		Sample Date	7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012		7/11/2012	
		Location	Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01	
		Depth (ft bgs)	3 - 5		7 - 9		7 - 9		3 - 5		3 - 5		0 - 2	
	Background Values - Soil (mg/kg)[a]	LANL (2012) ESLs (mg/kg)[b]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	**77.1**		**82.6**				**85.2**		**87.2**		**88.1**	
VOLATILES (mg/kg)														
METHYL ISOBUTYL KETONE	NE	9.8 / 98	0.0064	U	**0.0058**	J	0.0056	U	0.0065	U	0.006	U	0.0056	U
METHYLCYCLOHEXANE	NE	NSV	0.0016	UJ	0.0016	UJ	0.0015	UJ	0.0015	UJ	0.0014	UJ	**0.0017**	
METALS (mg/kg)														
ALUMINUM	13722	pH Dependent	**2070**		**5210**		**3500**		**18000**		**13800**		**16900**	
ARSENIC	3.7	6.8 / 68	1.1	U	**1.8**	J	1.2	U	**3.6**	J	**3.2**	J	**3.1**	J
BARIUM	169	110 / 260	**29.1**	J	**57.6**	J	**38.4**	J	**118**		**67.8**	J	**103**	
BERYLLIUM	1.6	2.5 / 25	0.54	U	0.47	U	0.58	U	**0.74**	J	**0.6**	J	**0.73**	J
CALCIUM	317332	NSV	**241000**		**132000**		**167000**		**87800**		**73000**		**78900**	
CHROMIUM	25	28 / 280	**1.7**	J	**4.7**		**3.3**	J	**15.9**		**12.4**		**14.6**	
COBALT	7.7	13 / 130	**0.9**	J	**2.1**	J	**1.1**	J	**5.5**	J	**4.6**	J	**5.4**	J
COPPER	13	15 / 46	**2.3**	J	**3.4**	J	**2.2**	J	**13.6**		**10.2**		**13.1**	
IRON	23049	NSV	**1620**		**4810**		**3200**		**15500**		**12600**		**14700**	
LEAD	10.9	14 / 28	**1.4**	J	**2.9**	J	**1.7**	J	**9**	J	**7.5**	J	**9.1**	
MAGNESIUM	16991	NSV	**3270**		**2580**		**1870**	J	**9510**		**5250**		**12200**	
MANGANESE	393	220 / 1,100	**34.7**		**82**		**59.7**		**387**		**292**		**400**	
MERCURY	0.0108	0.013 / 0.13	0.01	U	0.0092	U	0.0094	U	0.0093	U	**0.014**	J	**0.01**	J
NICKEL	17.4	9.7 / 19	**1.4**	J	**4.5**	J	**2.7**	J	**12.3**	J	**9.9**	J	**12.4**	J
POTASSIUM	5077	NSV	**684**	J	**1310**	J	**944**	J	**5320**		**3920**		**5550**	
SODIUM	5196	NSV	**941**	J	**1110**	J	**850**	J	**2610**	J	**1440**	J	**2600**	J
VANADIUM	42.6	0.025 / 0.25	**4.1**	J	**11**	J	**7.1**	J	**24.9**	J	**20.6**		**22.7**	
ZINC	54.6	48 / 480	**4.7**	J	**14**		**8.6**	J	**51.3**		**38.6**		**50**	

Table B
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 921 (OT-C531B) RFI Report
Holloman Air Force Base, New Mexico

LANL (2012) ESL values represented as: No-Effect ESL / Low-Effect ESL (e.g., 6.8 / 68 for arsenic)

LANL (2012) ESL Exceeded

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] Los Alamos National Laboratory (LANL), 2012, ECORISK Database, LA-UR-12-24548, Release 3.1, October.

dup = duplicate sample
EPA = U.S. Environmental Protection Agency
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J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Manganese (mg/kg)	d_Manganese (mg/kg)	Mercury (mg/kg)	d_Mercury (mg/kg)
34.7	1	0.01	0
82	1	0.0092	0
59.7	1	0.0094	0
387	1	0.0093	0
292	1	0.014	1
400	1	0.01	1

	A	B	C	D	E	F	G	H	I	J	K	L
1				**General UCL Statistics for Data Sets with Non-Detects**								
2	**User Selected Options**											
3	From File			input.wst								
4	Full Precision			OFF								
5	Confidence Coefficient			95%								
6	Number of Bootstrap Operations			2000								
7												
8												

Manganese (mg/kg)

General Statistics

Number of Valid Observations	6	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	34.7	Minimum of Log Data	3.547
Maximum	400	Maximum of Log Data	5.991
Mean	209.2	Mean of log Data	4.945
Geometric Mean	140.5	SD of log Data	1.062
Median	187		
SD	169.6		
Std. Error of Mean	69.25		
Coefficient of Variation	0.811		
Skewness	0.148		

Warning: A sample size of 'n' = 6 may not adequate enough to compute meaningful and reliable test statistics and estimates!

It is suggested to collect at least 8 to 10 observations using these statistical methods!

If possible compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Warning: There are only 6 Values in this data

Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.828	Shapiro Wilk Test Statistic	0.865
Shapiro Wilk Critical Value	0.788	Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	348.8	95% H-UCL	1940
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	622.8
95% Adjusted-CLT UCL (Chen-1995)	327.6	97.5% Chebyshev (MVUE) UCL	797.8
95% Modified-t UCL (Johnson-1978)	349.5	99% Chebyshev (MVUE) UCL	1141

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.81	**Data appear Normal at 5% Significance Level**	
Theta Star	258.3		
MLE of Mean	209.2		
MLE of Standard Deviation	232.5		
nu star	9.72		
Approximate Chi Square Value (.05)	3.768	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0122	95% CLT UCL	323.1
Adjusted Chi Square Value	2.557	95% Jackknife UCL	348.8
		95% Standard Bootstrap UCL	311.3
Anderson-Darling Test Statistic	0.52	95% Bootstrap-t UCL	336
Anderson-Darling 5% Critical Value	0.709	95% Hall's Bootstrap UCL	276.8
Kolmogorov-Smirnov Test Statistic	0.256	95% Percentile Bootstrap UCL	321
Kolmogorov-Smirnov 5% Critical Value	0.338	95% BCA Bootstrap UCL	306.7
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	511.1
		97.5% Chebyshev(Mean, Sd) UCL	641.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	898.2
95% Approximate Gamma UCL (Use when n >= 40)	539.8		
95% Adjusted Gamma UCL (Use when n < 40)	795.4		
Potential UCL to Use		Use 95% Student's-t UCL	348.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury (mg/kg)

General Statistics

Number of Valid Data	6	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	4
		Percent Non-Detects	66.67%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.01	Minimum Detected	-4.605
Maximum Detected	0.014	Maximum Detected	-4.269
Mean of Detected	0.012	Mean of Detected	-4.437
SD of Detected	0.00283	SD of Detected	0.238
Minimum Non-Detect	0.0092	Minimum Non-Detect	-4.689
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	4
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	66.67%

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00716	Mean	-5.047
SD	0.00396	SD	0.486
95% DL/2 (t) UCL	0.0104	95% H-Stat (DL/2) UCL	0.0127
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		95% t UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% H-UCL	N/A
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.0107
5% K-S Critical Value	N/A	SD	0.00149
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0008607
		95% KM (t) UCL	0.0124
Assuming Gamma Distribution		95% KM (z) UCL	0.0121
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.0138
Minimum	N/A	95% KM (bootstrap t) UCL	N/A
Maximum	N/A	95% KM (BCA) UCL	0.014
Mean	N/A	95% KM (Percentile Bootstrap) UCL	N/A
Median	N/A	95% KM (Chebyshev) UCL	0.0144
SD	N/A	97.5% KM (Chebyshev) UCL	0.016
k star	N/A	99% KM (Chebyshev) UCL	0.0192
Theta star	N/A		
Nu star	N/A	**Potential UCLs to Use**	
AppChi2	N/A	95% KM (t) UCL	0.0124
95% Gamma Approximate UCL (Use when n >= 40)	N/A	95% KM (% Bootstrap) UCL	N/A
95% Adjusted Gamma UCL (Use when n < 40)	N/A		

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

For additional insight, the user may want to consult a statistician.

Table C
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

Analyte		Sample Number	OTC531C-IS-0001-071312		OTC531C-IS-0003-071312		OTC531C-IS-0004-071312-FD		OTC531C-IS-0006-071312		OTC531C-IS-0008-071312		OTC531C-IS-0010-071312	
		Sample Date	7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012		7/13/2012	
		Location	Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 4, MW-01		Station 4, MW-01	
		Depth (ft bgs)	3 - 5		7 - 9		7 - 9		3 - 5		3 - 5		0 - 2	
	Background Values - Soil (mg/kg)[a]	LANL (2012) ESLs (mg/kg)[b]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	**79.5**		**81.6**		**80.5**		**75.2**		**81.2**		**84.9**	
VOLATILES (mg/kg)														
ACETONE	NE	1.2 / 6.3	0.027	U	0.019	U	0.018	U	0.027	U	0.025	U	**0.025**	J
METALS (mg/kg)														
ALUMINUM	13722	pH Dependent	**2520**		**7360**		**6190**		**2410**		**8420**		**10100**	
ARSENIC	3.7	6.8 / 68	1	U	**1.8**	J	1.2	U	0.95	U	**1.7**	J	**2.5**	J
BARIUM	169	110 / 260	**30.2**	J	**68.3**	J	**46.9**	J	**33.7**	J	**97.5**	J	**87.1**	J
CALCIUM	317332	NSV	**218000**		**204000**		**204000**		**246000**		**181000**		**146000**	
CHROMIUM	25	28 / 280	**2.3**	J	**8.6**		**7.2**		**2.1**	J	**7.2**		**8.8**	
COBALT	7.7	13 / 130	**1.2**	J	**3.4**	J	**2.4**	J	**1.1**	J	**2.7**	J	**3.6**	J
COPPER	13	15 / 46	**2.3**	J	**3.7**	J	**3**	J	**2**	J	**6**	J	**8.2**	J
IRON	23049	NSV	**2230**		**7510**		**6120**		**2020**		**7040**		**8750**	
LEAD	10.9	14 / 28	**1.1**	J	**4**	J	**2.9**	J	**0.66**	J	**4.1**	J	**6.3**	J
MAGNESIUM	16991	NSV	**2160**	J	**6070**		**6280**		**3340**		**4980**		**7520**	
MANGANESE	393	220 / 1,100	**37.5**		**142**		**111**		**39.2**		**145**		**208**	
NICKEL	17.4	9.7 / 19	**2.4**	J	**7.4**	J	**6.1**	J	**2.5**	J	**5.8**	J	**7.8**	J
POTASSIUM	5077	NSV	**721**	J	**1950**	J	**1640**	J	**933**	J	**3020**	J	**3800**	J
SODIUM	5196	NSV	580	U	**972**	J	**932**	J	**2950**	J	**2560**	J	**3250**	J
VANADIUM	42.6	0.025 / 0.25	**8.8**	J	**15**	J	**11.9**	J	**6.4**	J	**13.4**	J	**17.6**	J
ZINC	54.6	48 / 480	**5.3**	J	**19.5**		**16.1**		**5.3**	J	**20.9**		**28**	

Table C
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 922 (OT-C531C) RFI Report
Holloman Air Force Base, New Mexico

LANL (2012) ESL values represented as: No-Effect ESL / Low-Effect ESL (e.g., 6.8 / 68 for arsenic)

LANL (2012) ESL Exceeded

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] Los Alamos National Laboratory (LANL), 2012, ECORISK Database, LA-UR-12-24548, Release 3.1, October.

dup = duplicate sample
EPA = U.S. Environmental Protection Agency
FD = field duplicate
ft bgs = feet below ground surface
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Final

RCRA Facility Investigation Report
Group 1 – Building 924 (OT-C532)
Holloman Air Force Base, New Mexico

Prepared for U.S. Air Force Civil Engineer Center
2261 Hughes Ave., Suite 155
Lackland Air Force Base, Texas 78236-9861

Prepared by Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

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(A CB&I Company)

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Acronyms and Abbreviations

AFB	Air Force Base
bgs	below ground surface
COPC	constituent of potential concern
DPT	direct push technology
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
ESL	ecological screening levels
ft	foot/feet
GPR	ground-penetrating radar
GRO	gasoline range organics
HI	hazard index
LANL	Los Alamos National Laboratory
MDL	method detection limit
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
ORO	oil range organics
PID	photoionization detector
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RSL	Regional Screening Level
Shaw	Shaw Environmental & Infrastructure, Inc. (a CB&I Company)
SLERA	screening level ecological risk assessment
SSL	soil screening level
SVOC	semivolatile organic compound
TAL	target analyte list
TDS	total dissolved solids
TPH	total petroleum hydrocarbons
VOC	volatile organic compound
WQS	water quality standards

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1.0 INTRODUCTION

Shaw Environmental & Infrastructure, Inc. (Shaw), a CB&I company, prepared this Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for the Air Force Civil Engineer Center (formerly the Air Force Center for Engineering and the Environment) under Contract No. FA8903-09-D-8580, Task Order No. 0013, Modification 01. Results presented in this report are from the investigation of the abandoned septic tank located at Building 924 (OT-C532) at Holloman Air Force Base (AFB), New Mexico, which was one of the fifteen Group 1 septic tank sites under the Midwestern Region Performance-Based Remediation Contract. This RFI Report has been prepared pursuant to the requirements of the Holloman AFB Hazardous Waste Facility RCRA Permit No. NM6572124422 (the Permit) (New Mexico Environment Department [NMED], 2004). The purpose of this RFI was to delineate potential contamination that may have been released to the environment from the Building 924 septic tank system.

Holloman AFB is situated in south-central New Mexico in the northwest central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). The 15 Group 1 former septic tank sites are located throughout Holloman AFB (Figure 1-2). Each former septic tank is positioned adjacent to a building; as a result, each septic tank is named in reference to its most proximal building (i.e., OT-C530 [Building 308], OT-C531 [Buildings 920, 921, and 922], OT-C532 [Building 924], OT-C533 [Building 1190], OT-C534 [Building 1194], OT-C535 [Building 1196], OT-C536 [Building 1199], OT-C537 [Building 1200], OT-C538 [Building 1201], OT-C539 [Building 1221], OT-C540 [Building 1251], OT-C541 [Building 1269], OT-C542 [Building 1166], OT-C543 [Building 1175], and OT-C544 [Building 1176]). This report presents a summary of the RFI work conducted at abandoned septic tank OT-C532 at Building 924.

Building 924 was constructed in 1959 for ammunition assembly, primarily for bolting rocket components together before use. It was later used for the maintenance of radar tracking equipment, munitions storage, and rocket motor storage. The *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) report (included in Appendix A) indicates that the building contained a toilet urinal, lavatory, and janitorial sink which discharged to the sewer system. There was no floor drain at Building 924. The septic tank was abandoned in place in January 2008 by opening the tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill (North Wind, Inc. 2008 – also included in Appendix A).

1.1 Purpose of the Investigation

Investigative activities were undertaken at Holloman AFB to determine the nature and extent of contamination, and propose recommendations for either closure or additional corrective

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action, if necessary, at 15 inactive, abandoned, or removed septic tank systems, following the general guidance for closing septic systems found in 20.7.3.307 New Mexico Administrative Code (NMAC) Standards – Abandoned Sewers and On-Site Liquid Waste Systems.

Project quality objectives for each septic tank site consisted of the following:

- Gather and review all site historical information
- Identify septic tank components and historical uses
- Remove septic tank contents and contaminated soil (where necessary), and abandon the tank (where necessary)
- Determine the nature and extent of residual constituents of concern at each site, including potential pathways to groundwater
- Evaluate the risk at each site
- Develop conclusions and recommendations for each site.

This RFI Report presents the data collected to meet these project quality objectives at the Building 924 abandoned septic tank.

1.2 Scope of Activities

This RFI Report describes all activities associated with the septic tank investigation at Building 924, including site layout, soil sampling, soil analysis, as-built pipe mapping, and site boundary survey. All work was performed in accordance with the Holloman AFB *Basewide Septic Tank Solid Waste Management Units RFI Work Plan* (U.S. Army Corps of Engineers [USACE], 2010) and the *Quality Program Plan* (Shaw, 2012a). The *Quality Program Plan* (Shaw, 2012a) contains the Site Safety and Health Plan; the Uniform Federal Policy – Sampling and Analysis Plan/Quality Assurance Project Plan; and the Construction Quality Plan, which defines the methodology and practices that were used to control construction work during the performance of the RFI.

1.3 Regulatory Setting

The Holloman Permit established the general and specific standards and activities for managing hazardous waste pursuant to Subtitle C of RCRA, the New Mexico Hazardous Waste Act, and the New Mexico Hazardous Waste Management Regulations. The Permit also set forth requirements for investigation, notification, corrective action, and reporting for the storage, management, and releases of hazardous wastes.

The 15 septic systems were inactive, abandoned, or previously removed as indicated in *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) (Appendix A), and were not

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listed in the Permit (NMED, 2004). The Holloman AFB *Basewide Septic Tank Solid Waste Management Units RFI Work Plan* (USACE, 2010) was approved by NMED in a letter dated January 13, 2010 (NMED, 2010). The NMED-approved *RFI Work Plan* contained investigation activities only; therefore, Shaw submitted a *Voluntary Corrective Measure Request* (Shaw, 2012b) to include remediation and closure tasks that address septic system abandonment using 20.7.3.307 NMAC (Abandoned Sewers and On-Site Liquid Waste Systems). NMED has primary regulatory responsibility for the septic system sites; therefore corrective action must be performed under Title 20 NMAC.

The septic tank investigations were based on action/cleanup levels stipulated in Appendix 4-F of the Permit to be protective of human health and the environment. Permit Appendix 4-F specifies that soil contaminant concentrations be compared with the NMED residential soil screening levels (SSL), as presented in the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a), or the *U.S. Environmental Protection Agency (EPA) Regions 3, 6, and 9 Regional Screening Levels* (EPA, 2012a), if no NMED residential SSL has been established. Holloman AFB also has NMED-approved background concentrations for metals in soil (NMED, 2012b).

For groundwater, the Permit specifies that the more stringent of either the New Mexico Water Quality Control Commission (NMWQCC) water quality standards (WQS) (20.6.2 NMAC), or the EPA maximum contaminant levels for drinking water, be used for comparison with measured sample concentrations (EPA, 2012b).

1.4 RFI Report Organization

This RFI Report is organized into the following sections:

- **Section 1.0**, **Introduction**: Identifies the objectives and purpose of this report.
- **Section 2.0, Environmental Setting**: Provides pertinent descriptions of history, location, physiography, topography, surface water, hydrology, regional geology, soil types, regional hydrogeology, climate, current and future land use, and current and future water use for Holloman AFB.
- **Section 3.0, Source Characterization**: Presents the data collection techniques and locations, as well as analytical methods.
- **Section 4.0, Investigation Results and Evaluation**: Details the soil analytical results, and evaluates the human health risk due to site contaminants.

- **Section 5.0, Data Quality Assurance and Data Quality Control Review**: Summarizes the analytical data validation results.

- **Section 6.0, Conclusions and Recommendations**: Presents the conclusions and recommendations of this RFI report.

- **Section 7.0, References**: Lists the references cited in this report.

In addition to the figures and tables listed in the table of contents, the following appendices are included in this report:

- **Appendix A** – Historical Records
- **Appendix B** – Photographic Log
- **Appendix C** – Geophysical Report
- **Appendix D** – Sample Collection Logs
- **Appendix E** – Boring Logs
- **Appendix F** – Site Survey Data
- **Appendix G** – Laboratory Analytical Data and Data Validation Reports
- **Appendix H** – Waste Manifests
- **Appendix I** – Risk Evaluation Calculations
- **Appendix J** – Ecological Evaluation.

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2.0 ENVIRONMENTAL SETTING

This section provides background information for Holloman AFB including physical setting, history, topography, climate, soils, geology, hydrology, and land and water use.

2.1 Physical Setting

Holloman AFB is situated in south-central New Mexico, in the northwest-central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). Holloman AFB has a population of 6,000, and occupies 59,639 acres in the northeast quarter of Section 1, Township 17 South, Range 8 East. The White Sands Missile Range testing facilities occupy additional land extending northward from the base. Privately- and publicly-owned lands border the remainder of Holloman AFB. The major highway servicing Holloman AFB is Highway 70, which runs southwest from the town of Alamogordo, New Mexico, and separates Holloman AFB from publicly owned lands to the south. Alamogordo, New Mexico, which has a population of 30,401 according to the 2010 U.S. Census, is located approximately 7 miles east of the base.

2.2 Holloman Air Force Base History

Holloman AFB was first established in 1942 as Alamogordo Army Air Field. From 1942 through 1945, Alamogordo Army Air Field served as the training grounds for over 20 different flight groups, flying primarily B-17s, B-24s, and B-29s. After World War II, most operations had ceased at the base. In 1947, Air Material Command announced the air field would be its primary site for the testing and development of unmanned aircraft, guided missiles, and other research programs. On January 13, 1948, the Alamogordo installation was renamed in honor of the late Colonel George V. Holloman, a pioneer in guided missile research. In 1968, the 49th Tactical Fighter Wing arrived at Holloman AFB, and has remained since. Today, Holloman AFB also serves as the training center for the German Air Force's Tactical Training Center.

2.3 Physiography and Topography

Holloman AFB is located within the Sacramento Mountains physiographic province on the western edge of the Sacramento Mountains. The base is approximately 59,600 acres in area, and is located at a mean elevation of 4,093 feet (ft) above mean sea level. The region is characterized by high tablelands with rolling summit plains; cuesta-formed mountains dipping eastward; and west-facing escarpments, with the wide bracketed basin forming the basin and range complex. Holloman AFB is located in the Tularosa Basin, which is part of the Central Closed Basins. The bordering mountains rise abruptly to altitudes of 7,000 to 12,000 ft above mean sea level. The San Andres Mountains bound the basin to the west

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(approximately 30 miles) with the Sacramento Mountains approximately 10 miles to the east (Figure 2-1). At its widest, the basin is approximately 60 miles east to west, and stretches approximately 150 miles north to south.

2.4 Climate

As a whole, New Mexico has a mild, arid to semiarid continental climate characterized by light precipitation totals, abundant sunshine, relatively low humidity, and relatively large annual and diurnal temperature ranges (Western Regional Climate Center, 2013). The climate of the Central Closed Basins varies with elevation. The base is located in the low areas and is characterized by warm temperatures and dry air. Daytime temperatures often exceed 100 degrees Fahrenheit in the summer months, and are in the middle 50s (degrees Fahrenheit) in the winter. A preponderance of clear skies and relatively low humidity permits rapid nighttime cooling resulting in average diurnal temperature ranges of 25 to 35 degrees Fahrenheit. Potential evapotranspiration, at 67 inches per year, significantly exceeds annual precipitation, usually less than 15 inches. Arid conditions resulting from very low rainfall amounts, coupled with the topographically induced wind patterns combining with the sparse vegetation, tend to cause localized “dust devils.” The annual rainfall for Alamogordo, New Mexico is 12 inches per year. Much of the precipitation falls during the midsummer monsoonal period (July and August) as brief, yet frequent, intense thunderstorms culminating in 30 to 40 percent of the total annual rainfall.

2.5 Regional Geology and Soils

2.5.1 Geology

The sedimentary rocks that make up the adjacent mountain ranges are between 250 and 500 million years old (New Mexico Bureau of Geology and Mineral Resources, 2012). During the period when the area was submerged beneath the shallow intracontinental sea, the layers of limestone, shale, gypsum, and sandstone were formed. In time, these layers were pushed upward through various tectonic forces forming a large bulge on the surface. Approximately 10 million years ago, the center began to subside resulting in a vertical drop of thousands of ft, leaving the edges still standing (the present-day Sacramento and San Andres mountain ranges). In the millions of years following, rainfall, snowmelt, and wind eroded the mountain sediments depositing them in the valley (i.e., Tularosa Basin). Water carrying eroded limestone, dolomite, gravel, and other materials continue to flow into the basin.

As the Tularosa Basin is a bolson, which is a basin with no surface drainage outlet, sediments carried by surface water into a closed basin are bolson deposits. The overlying alluvium generally consists of unconsolidated gravels, sands, and clays. Soils in the basin are derived from the adjacent ranges as erosional deposits of limestone, dolomite, and gypsum. A fining

sequence from the ranges towards the basin's center characterizes the area with the near-surface soils as alluvial, eolian, and lacustrine deposits. The alluvial fan deposits are laterally discontinuous units of interbedded sand, silt, and clay while the eolian deposits consist primarily of gypsum sands. The eolian and alluvial deposits are usually indistinguishable due to the reworking of the alluvial sediment by eolian processes. The playa, or lacustrine deposits, consist of clay containing gypsum and are contiguous with the alluvial fan and eolian deposits throughout the base. Stiff caliche layers, varying in thickness, have been identified at different areas of the base.

2.5.2 Soils

The U.S. Natural Resources Conservation Service (formerly the Soil Conservation Service) has identified two soil associations in the vicinity of Holloman AFB: (1) the Holloman-Gypsum Land-Yesum Complex, and (2) the Mead silty clay loam (Figure 2-2) (U.S. Department of Agriculture, 1981). The permeability of these horizons ranges from 4×10^{-4} to 1×10^{-3} centimeters per second.

The Holloman-Gypsum Land-Yesum Complex, 0 to 5 percent sloped soil, consists of larger areas of shallow and deep, well-drained soils and areas of exposed gypsum. The Holloman soil makes up approximately 35 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 13 inches of the substratum is pink, very fine sandy loam that is very high in gypsum. Below that, the substratum is white gypsum to a depth of more than 60 inches. This soil is calcareous and mildly alkaline to moderately alkaline. Permeability is moderate. Available water capacity is very low.

Gypsum Land makes up approximately 30 percent of the Holloman-Gypsum Land-Yesum Complex (0 to 5 percent slopes). Typically, less than 1 inch of very fine sandy loam overlies soft to hard, white gypsum. The deep Yesum consists of very fine sandy loam that makes up approximately 20 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 9 inches of the substratum is light brown, fine sandy loam that is very high in gypsum. Below that, the substratum is pink, very fine sandy loam to a depth of more than 60 inches. The soil is calcareous throughout, and is mildly alkaline. Permeability is moderate. Available water capacity is moderate. Many fine gypsum crystals are found throughout the profile.

The soil type found across the main drainage area for the installation is Mead silty clay loam, 0 to 1 percent slopes. This deep, poorly drained, nearly level soil is on outer fringes of alluvial fans. This soil formed in fine textured alluvium over lacustrine lake sediment. It is very high in salt content because of periodic flooding and poor drainage. Slopes are smooth and concave. Typically, the surface layer is reddish brown, silty clay loam and clay loam

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approximately 5 inches thick. The substratum, to a depth of 48 inches, is light reddish brown clay with a high content of salt. Below that, the substratum is lacustrine material of variable texture and color to a depth of more than 60 inches. Included within this soil are areas of Holloman soils and Gypsum Land along the margins of the unit of steep, short gully sides and knolls. These inclusions make up approximately 15 percent of the map unit for this soil type. Individual areas are generally smaller than 10 acres. This soil is moderately calcareous throughout and is moderately to strongly alkaline. It has a layer of salt that is more soluble than gypsum. Permeability is very low. Available water capacity is low.

2.6 Regional Hydrogeology

Groundwater occurs as an unconfined aquifer in the unconsolidated deposits of the central basin, with the primary source of recharge as rainfall percolation and minor amounts of stream runoff along the western edge of the Sacramento Mountains. Surface water/rainfall migrates downward into the alluvial sediments at the edge of the shallow aquifer near the ranges and flows through progressively finer-grained sediments towards the central basin. Because the Tularosa Basin is a closed system, water that enters the area leaves either through evaporation or percolation. This elevated amount of percolation results in a fairly high water table. Beneath Holloman AFB, groundwater ranges from 5 to 50 ft below ground surface (bgs). Flow for the base is generally towards the southwest with localized influences from the variations in the topography of the base (Figure 2-3). In the northern and western portions of the base, groundwater flows more to the west towards the Ritas Draw, Malone Draw, and Lost River drainages. Groundwater flow is affected by local topography in areas immediately adjacent to arroyos, where groundwater flows directly toward the drainages regardless of the regional flow pattern.

Groundwater in the Tularosa Basin is of potable quality at the recharge areas in close proximity to the Sacramento Mountains and becomes increasingly mineralized toward the central portion of the basin and discharge areas. The majority (over 70 percent) of the Environmental Restoration Program sites located across Holloman AFB have groundwater monitoring wells containing water with an average TDS concentration greater than 10,000 mg/L. These TDS data support the hypothesis that TDS concentrations below 10,000 mg/L at Holloman AFB are caused by dilution of natural groundwater quality from leaking water lines and surface irrigation from the domestic water supply. TDS concentrations greater than 10,000 mg/L exceed the NMWQCC WQS as potable water (20.6.2 NMAC), and thus, the groundwater beneath Holloman AFB has been designated as unfit for human consumption. Likewise, the EPA guidelines have identified the groundwater as a Class IIIB water source, characterized by TDS concentrations exceeding 10,000 mg/L, and is characterized by a low degree of interconnection with adjacent surface water or groundwater of a higher class. Groundwater does not discharge or connect to any adjacent

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aquifers, because the Tularosa Basin is a closed basin. Adjacent surface waters include Lost River and Lake Holloman, which also have high concentrations of TDS, and are not considered potential drinking water sources.

2.7 Surface Water and Hydrology

The Tularosa Basin contains all of the surface flow in its boundaries. The nearest inflow of surface waters to Holloman AFB comes from the Lost River, located in the north-central region of the base. The upper reaches of the Three Rivers and the Sacramento River are perennial in the basin. Holloman AFB is dissected by several southwest-trending arroyos that control the surface drainage. Hay Draw arroyo is located in the far north. Malone and Ritas Draws, which drain into the Lost River and Dillard Draw arroyos, are located along the eastern perimeter of the base. Approximately 10,000 years ago, indications are that a much wetter climate existed. The present-day Lake Otero encompassed a much larger area, possibly upwards of several hundred square miles. Its remains are the Alkali Flat and Lake Lucero. Lake Lucero is a temporary feature of merely a few inches in depth during the rainy season.

Ancient lakes and streams deposited water-bearing deposits over the older bedrock basement materials. Fractures, cracks, and fissures in the Permian and Pennsylvanian bedrock yield small quantities of relatively good-quality water in the deeper peripheral. Potable water is only found from wells near the edges of the basin, with more saline water towards the center. Two of the principal sources of potable water are: (1) a long narrow area on the upslope sides of Tularosa and Alamogordo, and (2) in the far southwestern part of the basin. A portion of the city of Alamogordo's water, as well as Holloman AFB's water, is supplied from Bonito Lake (which is in the Pecos River Basin).

2.8 Current and Future Land Use

The land surrounding Holloman AFB consists of residential areas to the east and northeast (city of Alamogordo, New Mexico), rangeland to the south, the White Sands National Monument to the west, and areas where military activities are conducted to the north. The desert terrain of the area immediately surrounding Holloman AFB has limited development, and there are no agricultural operations, residential communities, or large industrial operations located adjacent to the base. The Boles Well Field, a freshwater source for Holloman AFB, is located approximately 6 miles to the southeast of the base. Holloman AFB is an active military installation and is expected to remain active for the foreseeable future. No transfer of military property to the public is anticipated, and public access to the base is restricted. Future land use is not expected to differ significantly from current land use practices (Foster Wheeler Environmental Corporation, 2002).

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2.9 Current and Future Water Use

At present, Holloman AFB receives approximately 50 percent of its freshwater supply from the Boles Well Field. An additional freshwater resource for Holloman AFB, and for the city of Alamogordo, New Mexico, is Bonito Lake, located 60 miles northeast of the Tularosa Basin. Currently, there are no potable supplies of groundwater or surface water located on the base because of poor groundwater quality with TDS concentrations greater than 10,000 mg/L.

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3.0 SOURCE CHARACTERIZATION

This section presents the overall technical approach in general accordance with the *Basewide Septic Tank Solid Waste Management Units, RCRA Facility Investigation Work Plan, Holloman AFB, New Mexico* (USACE, 2010) (except where otherwise noted), and details the investigative and remediation activities that were implemented at Building 924. The primary environmental media of concern at Building 924 are soil and groundwater. The extent of contamination in soil was expected to be relatively local to the abandoned septic tank location. Therefore, the basic approach was to identify the abandoned septic tank location, and then work outward from the location in identifying contaminated soil. To evaluate the potential impacts to groundwater, a monitoring well was planned for installation in the leach field of each inactive, abandoned, or removed septic tank. The analytical programs for both soil and groundwater focused on the expected nature of contamination likely to be associated with septic tank discharges.

The RFI conducted at abandoned septic tank OT-C532 (Building 924) was initiated as part of the Midwestern Region Performance-Based Remediation Contract. Under the *RFI Work Plan* (Shaw, 2012a) for this site, field activities included: pre-mobilization and mobilization/site setup activities, soil boring advancement, soil sample collection, and soil sample analysis. Appendix B is a photographic log of various Building 924 investigation activities.

3.1 Pre-mobilization/Mobilization Activities

Several pre-investigation documents were filed and approvals obtained, as follows:

- Civil Engineer Work Request (Air Force Form 332) approval
- Base digging permits (Air Force Form 103, Base Civil Engineering Work Clearance Request) with utility clearances
- Site security clearances
- Facility manager notification of the intended operations.

Prior to the start of activities, a pre-investigation kick-off meeting and site walk-through were conducted with the Air Force Civil Engineer Center resident engineer, Holloman AFB personnel, and Shaw's Construction Manager, to plan for equipment access, equipment staging, decontamination area layout, potential site hazards, emergency evacuation routes, and project schedule.

Prior to the submittal of the base digging permits, the drilling locations were delineated using marker flags, stakes, and paint. Utility clearance approvals were completed by the

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appropriate Holloman AFB utility office (i.e., telephone, sewer, water, natural gas, etc.), and by the New Mexico One Call utility clearance system. Upon receipt of the approved digging permit and utility clearances, Shaw's Construction Manager completed a site walk-through to confirm the utility and intrusive work locations. In addition, Shaw performed a site survey prior to the start of drilling activities to search for signs of other buried or overhead utilities.

3.2 Geophysical Investigation

A geophysical investigation was performed at Building 924 in an attempt to define the limits of the abandoned septic system. Methods employed included: visual inspection, electromagnetic induction conductivity detection, ground-penetrating radar (GPR), and electromagnetic pipe and cable location.

Electromagnetic induction conductivity detection ground induction methods are employed to detect broad metal mass anomalies or conductive zones that may be indicative of potential septic tanks, and lateral changes in conductive zones of soil or backfill materials relative to native soil. GPR is used to detect abandoned septic tank excavation sidewalls and fill areas. An electromagnetic pipe and cable survey was conducted to detect buried utility lines.

Electromagnetic and GPR surveys were conducted at Building 924 in June 2012. The location of the abandoned septic tank was identified, approximately 40 ft south of Building 924. The locations of the individual leach field piping could not be directly detected by the geophysical survey due to the similarity of composition of the clay pipes and the surrounding soil. However, the leach field could be identified by the geophysical survey equipment due to the differences in mineralization and conductivity between the native soil and the soils that were physically affected by normal leach field operation. The presence of the leach field piping was assumed within the leach field as identified by the geophysical survey which allowed for representative soil and groundwater sample collection. Underground utility lines, the septic tank influent line, the septic tank effluent line, and the septic tank leach field were also delineated for later reference during soil boring activities. Geophysical findings are shown on Figure 3-1. The complete geophysical report is included in Appendix C.

3.3 Soil Investigation

The soil investigation of the abandoned septic tank at Building 924 was conducted on July 16, 2012. The program consisted of sampling four borings advanced at the abandoned septic tank location, as shown on Figure 3-1. Soil boring Station 1 (sample numbers OTC532-IS-0001-071612 and OTC532-IS-0002-071612) was placed north of the abandoned septic tank near the influent line, Station 2 (sample numbers OTC532-IS-0003-071612, OTC532-IS-0004-071612, and OTC532-IS-0005-071612FD) was placed at the abandoned

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septic tank location, Station 3 (samples numbers OTC532-IS-0006-071612 and OTC532-IS-0007-071612) was placed south of the abandoned septic tank near the effluent line, and Station 4 (sample numbers OTC532-IS-0008-071612, OTC532-IS-0009-071612, OTC532-IS-0010-071612, and OTC532-IS-0011-071612) was placed in the leach field of the abandoned septic tank. All borings were advanced using direct push technology (DPT), with soil samples collected at depths of 3 to 5 ft and 10 to 12 ft at Station 1; and 7 to 9 ft and 14 to 16 ft at Station 2; 3 to 5 ft and 10 to 12 ft at Station 3; and 0 to 2 ft, 3 to 5 ft, 9 to 11 ft, and 10 to 12 ft at Station 4. Appendix D has copies of the sample collection logs. A field duplicate was collected from the 14 to 16 ft depth at Station 2.

Soil samples were logged in the field in accordance with the Unified Soil Classification System requirements, and sample depths were in general accordance with the *RFI Work Plan* (USACE, 2010). Soil samples were not screened with a photoionization detector since there was no sensory evidence of contamination. Appendix E has copies of the soil boring logs.

Soil samples for volatile organic compound (VOC) analysis were collected in accordance with EPA Method 5035, using a TerraCore® Sampler device (EPA, 1986), while non-VOC sample aliquots were placed in laboratory-provided containers. Samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), explosives, polychlorinated biphenyls (PCBs), target analyte list (TAL) metals, total petroleum hydrocarbons (TPH)-gasoline range organics (GRO), TPH-diesel range organics (DRO), TPH-oil range organics (ORO), cyanide, percent solids, and tritium by Accutest Laboratories, Inc., a National Environmental Laboratory Accreditation Program-accredited laboratory, using EPA analytical methods, as summarized on Table 3-1.

The excess sample core soil extracted using the DPT drilling method was placed in 55-gallon drums for later characterization and transport to a licensed disposal facility. The boreholes were abandoned upon completion by plugging from the bottom of the borehole to ground surface using bentonite pellets, then patched with cement to match the surrounding land surface contour. The soil borings were then covered with gravel to match the surrounding land surface contour. Soil boring equipment was decontaminated between borings as detailed in Holloman AFB Standard Operating Procedure 2, “Sampling Equipment Decontamination” (located in Appendix B of the *RFI Work Plan* [USACE, 2010]) and Shaw’s Standard Operating Procedure No. EI-FS-014, “Decontamination of Contact Sampling Equipment.”

3.4 Groundwater Investigation

An attempt to investigate groundwater was made at the Building 924 former septic tank location. The only groundwater encountered during soil boring installation was at Station 2, which had a thin, localized saturated zone at 15 ft bgs. This zone was not considered adequate to produce groundwater in an amount sufficient for the collection of groundwater

samples. No groundwater was observed in any of the other three borings placed along the septic tank influent line and leach field, at distances of up to 50 ft away from the former UST location. A monitoring well was planned for installation at the Station 4 leach field location. However, since groundwater was not encountered, a monitoring well was not installed, and groundwater sampling was not performed as a part of this investigation.

3.5 Investigation-Derived Waste

The nonhazardous investigation-derived wastes that were generated during the RFI were segregated into the following categories:

- Soil – drill cuttings soil
- Water – decontamination liquids.

Upon generation, investigation-derived waste was properly containerized and temporarily stored at the designated laydown yard, as specified by Holloman AFB. Wastes were contained in sealed, U.S. Department of Transportation–approved, steel 55-gallon drums (for soil cuttings and decontamination water), roll-off containers with liners and covers (for excavated waste soil), and a 1,400-gallon plastic tank (for waste water). The waste soil drums were emptied into 20 cubic yard roll-off containers, and the waste waters were pumped into a bulk plastic tank prior to characterization sampling and analysis for disposal. The drill cuttings from the Building 924 Site were placed into the 20-cubic-yard roll-off containers along with soils from other Holloman AFB investigation sites.

3.6 Site Surveying

Soil borings and other site features shown on Figure 3-1 were surveyed by Albuquerque Surveying Company, Inc. from Albuquerque, New Mexico, a state-licensed surveyor.

Horizontal coordinates are referenced to the North American Datum 1983 State Plane Coordinate System, New Mexico-Central, and surveyed to an accuracy of $\pm$1.0 ft. Vertical elevations are referenced to the North American Vertical Datum 1988 coordinate system to an accuracy of $\pm$0.01 ft. A copy of the site survey results is presented in Appendix F.

3.7 Decontamination Procedures

A decontamination pad was constructed at the designated laydown area for decontamination of all downhole drilling equipment. The drilling rig was decontaminated prior to entering the site. Drilling equipment that came into contact with the borehole was decontaminated by hot-water pressure washing. Disposable equipment used for soil sample collection did not require decontamination.

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4.0 INVESTIGATION RESULTS AND EVALUATION

Soil analytical results presented in this section were used to delineate constituents of concern that may have been released to the environment, and confirm that no additional remedial measures are required.

4.1 Soil Analytical Results

DPT soil boring samples were collected during the Building 924 RFI, at the locations shown on Figure 3-1. All soil samples were sent to Accutest Laboratories, Inc., for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium analyses. Analytical results for the soil samples are presented in Table 4-1. Laboratory analytical data packages, and the data validation reports for the soil sample data, are provided in Appendix G.

The validated soil analytical results were compared with the NMED SSLs (NMED, 2012a), or the EPA Regional Screening Levels (RSL) (EPA, 2012a), if NMED residential SSLs were not available for a given analyte. In addition, a TPH screening level of 1,000 milligrams per kilogram (mg/kg) was used to evaluate the laboratory analytical data. The 1,000 mg/kg action level for petroleum-contaminated soil is the Residential Direct Exposure Limit for unknown oil, listed in Table 6-2, TPH Screening Guidelines for Potable Groundwater, of the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a).

No soil samples had detections above the NMED residential SSLs or the Holloman AFB soil background values. Likewise, all soil samples from all locations and depths had TPH-GRO, TPH-DRO, and TPH-ORO concentrations below the TPH screening level. In addition, no tritium was detected in any of the soil samples.

Thallium Detection Limit: Holloman AFB soil samples contain significant amounts of calcium, typically greater than 100,000 mg/kg (10 percent), and can be as high as 250,000 mg/kg (25 percent). Calcium at these levels contributes spectral interferences during inductively-coupled plasma metals analysis, and can also clog the nebulizer that is used to introduce the sample. Sample dilution is the recommended method for solving both the spectral interference issue and the nebulizer clogging issue. However, sample dilution raises the analytical method detection limits (MDL) for all associated metals.

A typical method detection limit for thallium during inductively-coupled plasma analysis is 0.13 mg/kg. Diluting by a factor of 5 to 20 to eliminate calcium spectral interference and nebulizer clogging causes the thallium detection limit to be elevated by a factor of 5 to 20. This results in a MDL that is above the NMED residential SSL of 0.782 mg/kg thallium.

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Consequently, the required remedy to allow for proper equipment operation resulted in MDLs that were above the NMED residential SSL. However, thallium is not an element that is anticipated to be present at Building 924 as a result of normal activities.

4.2 Groundwater Analytical Results

The only groundwater encountered during the groundwater investigation was a thin, localized saturated zone at 15 ft bgs at Station 2. This zone was not considered adequate to produce groundwater in an amount sufficient for the collection of groundwater samples Therefore, no monitoring well was installed, and no groundwater sampling was performed.

4.3 Investigation-Derived Waste Analytical Results

Waste characterization samples were collected from the bulk waste soil for analysis of Toxicity Characteristic Leaching Procedure VOCs, SVOCs, and RCRA metals. The results are presented in Table 4-2. The results of the waste soil analysis returned no concentrations above 40 Code of Federal Regulations Part 261.24 limits. The waste soil could be managed as nonhazardous waste and was subsequently transported to Otero/Greentree Regional Landfill, Alamogordo, New Mexico for disposal (Waste Manifest in Appendix H). The waste water from equipment decontamination was sampled and analyzed for VOCs, SVOCs, TAL metals, TPH-GRO, TPH-DRO, and TPH-ORO, with the analytical results presented in Table 4-3. The analytical results were reviewed by the Holloman AFB waste water treatment plant personnel, and subsequently accepted for disposal.

4.4 Risk-Based Evaluation

4.4.1 Soil

Eleven soil samples were collected at Building 924, from depths of 0 to 16 ft bgs, during the abandoned septic tank investigation. Per NMED (2012a), the soil depths of interest are 0 to 10 ft bgs for construction workers and residential receptors, and 0 to 1 ft bgs for commercial/industrial workers. Therefore, results from the screening assessment (Table 4-1) that present data for 0 to 10 ft bgs were used for the Risk Evaluation. Based on the initial results of the screening evaluation, no constituents of potential concern (COPC) have a concentration greater than NMED residential screening values (or EPA residential RSLs, if NMED values have not been established) or the Holloman AFB soil background values. Total cancer risk ratios and total hazard ratios (hazard index [HI]) to address potential additive toxicological effects were also assessed (per NMED 2012a, Section 5.0). This was conducted by using maximum detected concentrations of carcinogens and non-carcinogens, estimating risk and hazard ratios, and scaling a total cancer risk and total HI. The total cancer risk did not exceed 1.0×10^{-5} (total cancer risk: 7.7×10^{-6}), as shown in Appendix I. The

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total HI based on maximum detected concentrations was equal to 0.67 (Appendix I). As the target HI is 1.0, this is acceptable because the HI does not exceed 1.0.

Therefore, as no COPCs were selected for soil, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure are not health risks.

4.4.2 Groundwater

A saturated zone sufficient for groundwater sample collection zone was not encountered during the groundwater investigation. Therefore, no groundwater samples were collected at Building 924 and no risk evaluation was performed.

4.4.3 Risk-Based Conclusions

No COPCs were selected for soil; therefore, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure are not health risks. Additionally, total cancer risks and non-cancer hazards were acceptable for soil.

4.5 Ecological Evaluation

A screening-level ecological risk assessment (SLERA) Scoping Assessment Site Assessment Checklist was completed for the Building 924 (OT-C532) septic tank system and is included in Appendix J. The site of the former septic tank at Building 924 is a flat-lying, sandy surface within the fenced compound where the base's construction aggregate materials are stored, as shown in the photographic log in Appendix B. Heavy equipment for loading and unloading materials and trucks transporting the materials frequently pass near the footprint of the former septic tank system. However, results of the checklist Exclusion Criteria Decision Tree indicate that the site is a potential viable ecological habitat and a potential exposure pathway exists for soil; therefore, a SLERA was completed for Building 924.

Soil data results from 0 to 10 ft bgs were included in the comparison and are provided in Table A of Appendix J. According to NMED (2012c), this is the potential depth of interest for wildlife, including burrowing animals. As shown on Table A of Appendix J, six soil samples were available within the 0 to 10 ft bgs zone. Detected constituents in soil included 16 metals, cyanide, one VOC, petroleum hydrocarbons (both diesel and oil range), and one SVOC. All other constituents analyzed for were non-detected.

Metals concentrations were compared to Holloman AFB soil background values (Table A, Appendix J). Detected concentrations of metals did not exceed Holloman AFB soil background values in any soil samples evaluated. Therefore, no further evaluation was performed for metals.

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Detected concentrations of cyanide, acetone, and bis(2-ethylhexyl)phthalate) in soil data collected at the site were compared to the lowest available ecological screening levels (ESLs) presented in the Los Alamos National Laboratory (LANL) Eco Risk Database version 3.1 (LANL, 2012). The LANL database provides both No-Effect ESLs and Low-Effect ESLs for soil, and both values are provided in Table A of Appendix J. The single-detected concentrations of cyanide and acetone were both below their respective LANL ESL, indicating that ecological impacts are not likely to occur for these constituents. No ESLs are available for petroleum hydrocarbons from LANL (2012). The single-detected concentration of bis(2-ethylhexyl)phthalate) of 0.55 mg/kg exceeded both the No-Effect ESL (0.02 mg/kg) and the Low-Effect ESL (0.2 mg/kg). The endpoint of concern for the ESLs of 0.02 mg/kg and 0.2 mg/kg is potential food chain impacts for an avian insectivore. Bis(2-ethylhexyl)phthalate ESLs (from LANL, 2012) are as follows:

Receptor	No-Effect ESL	Low-Effect ESL	Units
American kestrel (Avian intermediate carnivore)	0.045	0.45	mg/kg
American kestrel (Avian insectivore)	0.02	0.2	mg/kg
American kestrel (Avian top carnivore)	0.033	0.33	mg/kg
American robin (Avian herbivore)	20	200	mg/kg
American robin (Avian omnivore)	0.04	0.4	mg/kg
Deer mouse (Mammalian omnivore)	1.1	11	mg/kg
Desert cottontail (Mammalian herbivore)	2700	27000	mg/kg
Montane shrew (Mammalian insectivore)	0.59	5.9	mg/kg
Red fox (Mammalian top carnivore)	1.2	12	mg/kg

The detected concentration of bis(2-ethylhexyl)phthalate (0.55 mg/kg) exceeded four No-Effect and Low-Effect ESLs, all for avian receptors (out of nine available receptor ESLs); therefore, a more detailed evaluation was conducted.

Per the Work Plan (USACE, 2010), more representative site-specific EPCs should be compared with screening values. EPCs are based on 95 percent UCL of the mean, if possible, estimated using EPA's ProUCL statistical software, version 4.1.01 (EPA, 2010 and EPA, 2011). However, as only one bis(2-ethylhexyl) phthalate result existed in the data set for OT-C532, ProUCL would not run, and gave the following warning statements:

> "Warning: Only one distinct data value was detected. ProUCL (or any other software) should not be used on such a data set. It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable bis(2-ethylhexyl) phthalate was not processed!"

Although this warning indicates other software should not be used, alternative values may be used. Therefore, a 95 percent UCL value was derived using a Bootstrap-t statistical program, described by Efron (1982) and discussed in EPA (1997). Non-detect values, if present, were represented in this Bootstrap-t program as random numbers between zero and the detection limit that were generated by the iterative process written into the program.

The Bootstrap-t method is a nonparametric method recommended by EPA for censored data and was used to calculate 95 percent UCLs for bis(2-ethylhexyl) phthalate when ProUCL would not run. Bootstrap 95 percent UCLs were calculated as follows (Efron and Tibshirani, 1993):

1) The data set was randomly resampled with replacement;
2) The arithmetic mean of the resampled data set was estimated;
3) Steps 1 and 2 were performed 2,000 times and created a new data set of 2,000 resampled means; and
4) The 95th percentile of the resampled mean data set created during Step 3 was selected.

Per Efron and Tibshirani (1993), the 95th percentile of the resampled mean data set is a good approximation of the 95 percent UCL on the mean of the original data set.

Using this Bootstrap method, the 95 percent UCL for bis(2-ethylhexyl) phthalate in soil samples is 0.214 mg/kg (Appendix J). The bis(2-ethylhexyl) phthalate EPC still exceeds the lowest No-Effect ESL (0.02 mg/kg) for an avian insectivore, and also exceeds the Low-Effects ESL (0.2 mg/kg). The EPC of 0.214 mg/kg exceeds four of the nine LANL No-Effect ESLs, but exceeds only the lowest Low-Effect ESL (i.e., 0.2 mg/kg for the avian insectivore, the American kestrel). The American kestrel has an average territory of 314 acres (EPA, 1993).

Bis(2-ethylhexyl) phthalate was only detected in one of six soil samples collected in the 0 to 10 ft bgs interval. Since the bis(2-ethylhexyl) phthalate Low-Effects ESL for avian insectivores of 0.2 mg/kg is exceeded by both the maximum and the 95 percent UCL, adverse effects to populations of avian insectivores cannot be ruled out. Additionally, the bis(2-ethylhexyl) phthalate No-Effects ESL for avian intermediate and top carnivores, as well as the avian omnivore, were exceeded by the 95 percent UCL concentration. However, the 95 percent UCL concentration was below the Low-Effects ESLs for these same receptors.

Bis(2-ethylhexyl) phthalate is a common laboratory contaminant. It is possible that the presence of this chemical in soil at Building 924 is related to standard operational procedures employed by the laboratory, rather than it being related to site activities associated with the former septic system. For Building 924, the investigation of the former septic system focused

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on the area of the former septic tank and its associated leach filed. This area is estimated to be approximately 0.06 acres. Of the receptors evaluated by LANL, the deer mouse, the montane shrew, and the desert cottontail would be the receptors most likely to be impacted by constituents in soil at the site due to these receptor's very small territories or home ranges and close association with soil. However, the maximum concentration and the 95 percent UCL concentrations of bis(2-ethylhexyl) phthalate at the site are less than the ESLs for these receptors. Therefore, it is concluded that risks to sensitive wildlife receptors at and surrounding the site are generally acceptable because of the very small size of the site (i.e., the impacted soil area is only 0.06 acres) and the finding that potentially sensitive avian receptors such as the American kestrel have very large territories (exceeding approximately 300 acres).

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5.0 DATA QUALITY ASSURANCE AND DATA QUALITY CONTROL REVIEW

All analytical data was reviewed in accordance with EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA, 2004a) and the EPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (EPA, 2004b). Data qualifiers were added to the database prior to project use. The data tables provided in Section 4.0 show the data qualifiers added during data validation. Detailed data validation reports for each data deliverable are provided in Appendix G.

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6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary and Conclusions

6.1.1 Soil

Eleven soil samples were collected at Holloman AFB Building 924 during the abandoned septic tank investigation, and analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium. Validated analytical results were compared with the NMED residential SSLs, the NMED Residential Direct Exposure Limit for soil contaminated with unknown petroleum oil, and the Holloman AFB soil background values. No parameters were detected that exceeded the New Mexico residential soil screening values or the Holloman AFB soil background values. Likewise no TPH was detected above 1,000 mg/kg in any of the soil samples from any depth or location.

Risk-based health screening concluded that no COPCs were identified in soil. The ecological evaluation concluded that risks to sensitive wildlife receptors at and surrounding the site are generally acceptable because of the very small size of the site and the finding that potentially sensitive avian receptors such as the American kestrel have very large territories.

6.1.2 Groundwater

A saturated zone sufficient for groundwater sample collection was not encountered during the groundwater investigation. Therefore, no groundwater samples were collected at Building 924 and a risk-based health screening assessment was not performed.

6.2 Recommendations

6.2.1 Soil

COPCs were not present in soil above the NMED residential SSLs. Therefore, no additional corrective action is recommended for soil at Building 924.

6.2.2 Groundwater

A saturated zone sufficient for groundwater sample collection was not encountered during the groundwater investigation. Therefore, no additional corrective action is recommended for groundwater at Building 924.

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Tables

Table 3-1
Sample Summary
Building 924 (OT-C532) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OTC532-Station 1	667268.7804	1678627.7722	7/16/2012	Investigation Soil	3 - 5	OTC532-IS-0001-071612	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/16/2012	Investigation Soil	10 - 12	OTC532-IS-0002-071612	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OTC532-Station 2	667248.5702	1678632.4969	7/16/2012	Investigation Soil	7 - 9	OTC532-IS-0003-071612	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/16/2012	Investigation Soil	14 - 16	OTC532-IS-0004-071612	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0

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Sample Summary
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Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OTC532-Station 2	667248.5702	1678632.4969	7/16/2012	Investigation Soil - Field Duplicate	14 - 16	OTC532-IS-0005-071612-FD	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OTC532-Station 3	667225.7319	1678628.5410	7/16/2012	Investigation Soil	3 - 5	OTC532-IS-0006-071612	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/16/2012	Investigation Soil	10 - 12	OTC532-IS-0007-071612	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0

Table 3-1
Sample Summary
Building 924 (OT-C532) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OTC532-Station 4	667192.2706	1678614.9649	7/16/2012	Investigation Soil	3 - 5	OTC532-IS-0008-071612	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/16/2012	Investigation Soil	10 - 12	OTC532-IS-0009-071612	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/16/2012	Investigation Soil	0 - 2	OTC532-IS-0010-071612	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/16/2012	Investigation Soil	9 - 11	OTC532-IS-0011-071612	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0

Table 3-1
Sample Summary
Building 924 (OT-C532) RFI Report
Holloman Air Force Base, New Mexico

[a] Coordinates are referenced to the North American Datum, 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] EPA, 2007, Test Methods for Evaluating Soil Waste Physical/Chemical Methods, EPA Publication SW-846, Final Update IV. Available online at www.epa.gov/osw/hazard/testmethods/sw846.

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EPA = Environmental Protection Agency
FD = field duplicate
ft bgs = feet below ground surface
GRO = gasoline range organics
IS = investigation soil
MW = monitoring well
ORO = oil range organics
PCB = polychlorinated biphenyl
RFI = RCRA Facility Investigation
RCRA = Resource Conservation and Recovery Act
SVOC = semivolatile organic compound
TAL = target analyte list
TPH = total petroleum hydrocarbons
VOC = volatile organic compound

Table 4-1
Soil Analytical Data
Building 924 (OT-C532) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC532-IS-0001-071612		OTC532-IS-0002-071612		OTC532-IS-0003-071612		OTC532-IS-0004-071612		OTC532-IS-0005-071612-FD		OTC532-IS-0006-071612		OTC532-IS-0007-071612		OTC532-IS-0008-071612		OTC532-IS-0009-071612		OTC532-IS-0010-071612		OTC532-IS-0011-071612	
				Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		9 - 11	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**74.5**		**75.9**		**80.9**		**78.6**		**79**		**77.3**		**77.9**		**77.8**		**75.7**		**82.1**		**75.6**	
VOLATILES (mg/kg)																										
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0012	U	0.00093	U	0.0015	U	0.0015	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00096	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0013	U	0.001	U	0.0016	U	0.0017	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.001	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0018	U	0.0014	U	0.0023	U	0.0024	U	0.0016	U	0.0018	U	0.0017	U	0.0018	U	0.0017	U	0.0017	U	0.0015	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0012	U	0.00093	U	0.0015	U	0.0015	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00096	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0012	U	0.00093	U	0.0015	U	0.0015	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00096	U
1,1-DICHLOROETHENE	NE	240	449		0.0015	U	0.0012	U	0.0019	U	0.002	U	0.0013	U	0.0015	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0012	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0013	U	0.001	U	0.0016	U	0.0017	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.001	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0025	U	0.002	U	0.0031	U	0.0032	U	0.0021	U	0.0025	U	0.0023	U	0.0025	U	0.0024	U	0.0023	U	0.002	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.0011	U	0.00085	U	0.0013	U	0.0014	U	0.00091	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.00087	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0012	U	0.00093	U	0.0015	U	0.0015	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00096	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.0011	U	0.00085	U	0.0013	U	0.0014	U	0.00091	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.00087	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0013	U	0.001	U	0.0016	U	0.0017	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.001	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0013	U	0.001	U	0.0016	U	0.0017	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.001	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0012	U	0.00093	U	0.0015	U	0.0015	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00096	U
2-HEXANONE	NE	210	NE		0.0058	U	0.0046	U	0.0072	U	0.0076	U	0.0049	U	0.0058	U	0.0055	U	0.0058	U	0.0056	U	0.0055	U	0.0047	U
ACETONE	NE	61000	66600		0.021	U	0.017	U	0.027	U	0.028	U	0.018	U	0.022	U	0.02	U	0.022	U	0.021	U	0.02	U	**0.0181**	J
BENZENE	NE	1.1	15.4		0.0016	U	0.0013	U	0.002	U	0.0021	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0012	U	0.00093	U	0.0015	U	0.0015	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00096	U
BROMOFORM	NE	62	616		0.0016	U	0.0013	U	0.002	U	0.0021	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U
BROMOMETHANE	NE	7.3	16.5		0.0021	U	0.0017	U	0.0027	U	0.0028	U	0.0018	U	0.0022	U	0.002	U	0.0022	U	0.0021	U	0.002	U	0.0017	U
CARBON DISULFIDE	NE	820	1530		0.0021	U	0.0017	U	0.0027	U	0.0028	U	0.0018	U	0.0022	U	0.002	U	0.0022	U	0.0021	U	0.002	U	0.0017	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0019	U	0.0015	U	0.0024	U	0.0025	U	0.0016	U	0.0019	U	0.0018	U	0.0019	U	0.0019	U	0.0018	U	0.0016	U
CHLOROBENZENE	NE	290	376		0.0011	U	0.00085	U	0.0013	U	0.0014	U	0.00091	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.00087	U
CHLOROETHANE	NE	15000	29800		0.0021	U	0.0017	U	0.0027	U	0.0028	U	0.0018	U	0.0022	U	0.002	U	0.0022	U	0.0021	U	0.002	U	0.0017	U
CHLOROFORM	NE	0.29	5.86		0.0013	U	0.001	U	0.0016	U	0.0017	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.001	U
CHLOROMETHANE	NE	120	275		0.0021	U	0.0017	U	0.0027	U	0.0028	U	0.0018	U	0.0022	U	0.002	U	0.0022	U	0.0021	U	0.002	U	0.0017	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0016	U	0.0013	U	0.002	U	0.0021	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0011	U	0.00085	U	0.0013	U	0.0014	U	0.00091	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.00087	U
CYCLOHEXANE	NE	7000	NE		0.0015	U	0.0012	U	0.0019	U	0.002	U	0.0013	U	0.0015	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0012	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.0011	U	0.00085	U	0.0013	U	0.0014	U	0.00091	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.00087	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0016	U	0.0013	U	0.002	U	0.0021	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U
ETHYLBENZENE	NE	5.4	68.4		0.0011	U	0.00085	U	0.0013	U	0.0014	U	0.00091	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.00087	U
ISOPROPYLBENZENE	NE	2100	2430		0.0012	U	0.00093	U	0.0015	U	0.0015	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00096	U
METHYL ACETATE	NE	78000	78200		0.013	U	0.011	U	0.017	U	0.018	U	0.011	U	0.013	U	0.013	U	0.013	U	0.013	U	0.013	U	0.011	U
METHYL ETHYL KETONE	NE	28000	37100		0.0065	U	0.0052	U	0.0081	U	0.0085	U	0.0056	U	0.0066	U	0.0062	U	0.0066	U	0.0063	U	0.0062	U	0.0053	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0059	U	0.0047	U	0.0073	U	0.0077	U	0.005	U	0.0059	U	0.0056	U	0.0059	U	0.0057	U	0.0056	U	0.0048	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0014	U	0.0011	UJ	0.0017	U	0.0018	U	0.0012	U	0.0014	U	0.0013	U	0.0014	U	0.0013	U	0.0013	U	0.0011	U
METHYLENE CHLORIDE	NE	56	409		0.0049	U	0.0039	U	0.0061	U	0.0064	U	0.0042	U	0.005	U	0.0047	U	0.005	U	0.0047	U	0.0047	U	0.004	U

Table 4-1
Soil Analytical Data
Building 924 (OT-C532) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC532-IS-0001-071612		OTC532-IS-0002-071612		OTC532-IS-0003-071612		OTC532-IS-0004-071612		OTC532-IS-0005-071612-FD		OTC532-IS-0006-071612		OTC532-IS-0007-071612		OTC532-IS-0008-071612		OTC532-IS-0009-071612		OTC532-IS-0010-071612		OTC532-IS-0011-071612	
				Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		9 - 11	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																										
STYRENE	NE	6300	7280		0.0028	U	0.0022	U	0.0035	U	0.0036	U	0.0024	U	0.0028	U	0.0026	U	0.0028	U	0.0027	U	0.0027	U	0.0023	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0021	U	0.0017	U	0.0027	U	0.0028	U	0.0018	U	0.0022	U	0.002	U	0.0022	U	0.0021	U	0.002	U	0.0017	U
TETRACHLOROETHYLENE	NE	22	7.02		0.0011	U	0.00085	U	0.0013	U	0.0014	U	0.00091	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.00087	U
TOLUENE	NE	5000	5270		0.0013	U	0.001	U	0.0016	U	0.0017	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.001	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0016	U	0.0013	U	0.002	U	0.0021	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0012	U	0.00093	U	0.0015	U	0.0015	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00096	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0013	U	0.001	U	0.0016	U	0.0017	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.001	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0021	U	0.0017	U	0.0027	U	0.0028	U	0.0018	U	0.0022	U	0.002	U	0.0022	U	0.0021	U	0.002	U	0.0017	U
VINYL CHLORIDE	NE	0.06	0.728		0.0016	U	0.0013	U	0.002	U	0.0021	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U
XYLENES, TOTAL	NE	630	814		0.0034	U	0.0027	U	0.0043	U	0.0045	U	0.0029	U	0.0034	U	0.0033	U	0.0035	U	0.0033	U	0.0033	U	0.0028	U
SEMIVOLATILES (mg/kg)																										
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
2,4-DICHLOROPHENOL	NE	180	183		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.028	U	0.027	U	0.026	U	0.026	U	0.026	U	0.027	U	0.027	U	0.027	U	0.027	U	0.025	U	0.027	U
2,4-DINITROPHENOL	NE	120	122		0.45	U	0.44	U	0.41	U	0.42	U	0.42	U	0.43	U	0.42	U	0.43	U	0.44	U	0.4	U	0.44	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
2,6-DINITROTOLUENE	NE	61	61.1		0.026	U	0.026	U	0.024	U	0.025	U	0.025	U	0.025	U	0.025	U	0.025	U	0.026	U	0.024	U	0.026	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
2-CHLOROPHENOL	NE	390	391		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
2-METHYLNAPHTHALENE	NE	230	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
2-METHYLPHENOL	NE	3100	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
2-NITROANILINE	NE	610	NE		0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
2-NITROPHENOL	NE	NE	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
3-NITROANILINE	NE	NE	NE		0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.089	U	0.087	U	0.082	U	0.083	U	0.084	U	0.086	U	0.084	U	0.086	U	0.087	U	0.081	U	0.087	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
4-CHLOROANILINE	NE	2.4	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
4-NITROANILINE	NE	24	NE		0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
4-NITROPHENOL	NE	NE	NE		0.18	U	0.17	U	0.16	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.16	U	0.17	U
ACENAPHTHENE	NE	3400	3440		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
ACENAPHTHYLENE	NE	NE	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
ACETOPHENONE	NE	7800	7820		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
ANTHRACENE	NE	17000	17200		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
ATRAZINE	NE	2.1	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U

Table 4-1
Soil Analytical Data
Building 924 (OT-C532) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC532-IS-0001-071612		OTC532-IS-0002-071612		OTC532-IS-0003-071612		OTC532-IS-0004-071612		OTC532-IS-0005-071612-FD		OTC532-IS-0006-071612		OTC532-IS-0007-071612		OTC532-IS-0008-071612		OTC532-IS-0009-071612		OTC532-IS-0010-071612		OTC532-IS-0011-071612	
				Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		9 - 11	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																										
BENZALDEHYDE	NE	7800	NE	0.22	U	0.22	U	0.2	U	0.21	U	0.21	U	0.21	U	0.21	U	0.21	U	0.22	U	0.2	U	0.22	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
BENZO(A)PYRENE	NE	0.015	0.148	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
BIPHENYL	NE	51	57.1	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.089	U	0.087	U	0.082	U	0.083	U	0.084	U	**0.55**		0.084	U	0.086	U	0.087	U	0.081	U	0.087	U
CAPROLACTAM	NE	31000	NE	0.071	U	0.07	U	0.065	U	0.067	U	0.067	U	0.069	U	0.067	U	0.069	U	0.07	U	0.065	U	0.07	U
CARBAZOLE	NE	NE	NE	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
CHRYSENE	NE	15	148	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
DIBENZOFURAN	NE	78	NE	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
DIETHYL PHTHALATE	NE	49000	48900	0.089	U	0.087	U	0.082	U	0.083	U	0.084	U	0.086	U	0.084	U	0.086	U	0.087	U	0.081	U	0.087	U
DIMETHYL PHTHALATE	NE	611000	611000	0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.089	U	0.087	U	0.082	U	0.083	U	0.084	U	0.086	U	0.084	U	0.086	U	0.087	U	0.081	U	0.087	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
FLUORANTHENE	NE	2300	2290	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
FLUORENE	NE	2300	2290	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.098	U	0.096	U	0.09	U	0.092	U	0.093	U	0.094	U	0.093	U	0.094	U	0.096	U	0.089	U	0.096	U
HEXACHLOROETHANE	NE	12	42.8	0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
ISOPHORONE	NE	510	5120	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
M,P-CRESOL	NE	NE	NE	0.032	U	0.031	U	0.029	U	0.03	U	0.03	U	0.031	U	0.03	U	0.031	U	0.031	U	0.029	U	0.031	U
NAPHTHALENE	NE	3.6	43.0	0.036	U	0.035	U	0.033	U	0.033	U	0.034	U	0.034	U	0.034	U	0.034	U	0.035	U	0.032	U	0.035	U
NITROBENZENE	NE	4.8	53.5	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.27	U	0.26	U	0.24	U	0.25	U	0.25	U	0.26	U	0.25	U	0.26	U	0.26	U	0.24	U	0.26	U
PHENANTHRENE	NE	1830	1830	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
PHENOL	NE	18000	18300	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
PYRENE	NE	1700	1720	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U

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Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC532-IS-0001-071612		OTC532-IS-0002-071612		OTC532-IS-0003-071612		OTC532-IS-0004-071612		OTC532-IS-0005-071612-FD		OTC532-IS-0006-071612		OTC532-IS-0007-071612		OTC532-IS-0008-071612		OTC532-IS-0009-071612		OTC532-IS-0010-071612		OTC532-IS-0011-071612	
				Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		9 - 11	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																										
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
1,3-DINITROBENZENE	NE	6.10	NE	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
2,4-DINITROTOLUENE	NE	1.60	15.7	0.074	U	0.074	U	0.082	U	0.079	U	0.072	U	0.091	U	0.075	U	0.083	U	0.082	U	0.094	U	0.088	U
2,6-DINITROTOLUENE	NE	61.0	61.1	0.066	U	0.067	U	0.074	U	0.07	U	0.064	U	0.082	U	0.067	U	0.075	U	0.073	U	0.084	U	0.079	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
2-NITROTOLUENE	NE	2.90	29.1	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
3-NITROTOLUENE	NE	6.10	7.82	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
4-NITROTOLUENE	NE	30.0	244.4	0.077	U	0.077	U	0.086	U	0.082	U	0.075	U	0.095	U	0.078	U	0.087	U	0.085	U	0.098	U	0.091	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
NITROBENZENE	NE	4.80	53.5	0.071	U	0.071	U	0.079	U	0.075	U	0.069	U	0.087	U	0.072	U	0.08	U	0.078	U	0.09	U	0.084	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
TETRYL	NE	240.0	244.0	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
METALS (mg/kg)																										
ALUMINUM	13722	77000	78000	**1300**		**7050**		**3270**		**8550**	J	**3000**	J	**3330**		**3300**		**688**		**1450**		**9980**		**1610**	
ANTIMONY	1.6	31	31.3	1.2	UJ	1.2	U	1.1	U	1.1	U	1.6	U	1.1	U	1.2	U	2.5	U	0.96	U	1.1	U	1	U
ARSENIC	3.7	0.39	3.90	1.2	U	1.2	U	1.1	U	**1.2**	J	0.81	U	1.1	U	1.2	U	1.3	U	**1.3**	J	**3**	J	1	U
BARIUM	169.3	15000	15600	**19.5**	J	**69.9**	J	**32.5**	J	**57.9**	J	**57.2**	J	**37.9**	J	**34.8**	J	**20**	J	**18.6**	J	**69.6**	J	**18.3**	J
BERYLLIUM	1.6	160	156	0.62	U	0.62	U	0.53	U	0.55	U	0.4	U	0.55	U	0.58	U	0.64	U	0.48	U	0.55	U	0.5	U
CADMIUM	0.3	70	70.3	0.62	UJ	0.62	U	0.53	U	0.55	U	0.81	U	0.55	U	0.58	U	1.3	U	0.48	U	0.55	U	0.5	U
CALCIUM	317332	NE	NE	**279000**		**219000**		**206000**		**175000**		**194000**		**274000**		**180000**		**272000**		**258000**		**196000**		**249000**	
CHROMIUM[d]	25	117000	117000	**0.88**	J	**7.3**		**2.9**	J	**8.6**	J	**3.1**	J	**2.5**	J	**3.5**	J	1.3	U	**1.2**	J	**8.7**		**1.3**	J
COBALT	7.7	23	NE	**0.7**	J	**2.3**	J	**1**	J	**5.1**	J	**1.3**	J	**1.3**	J	**1.5**	J	**0.66**	J	**0.8**	J	**3.3**	J	**0.58**	J
COPPER	13	3100	3130	**2.2**	J	**3**	J	**2.3**	J	**4.1**	J	**1.4**	J	**2.7**	J	**1.6**	J	**1.7**	J	**1.3**	J	**8.4**	J	**1.4**	J
IRON	23049	55000	54800	**994**		**6260**		**2750**		**8130**	J	**2980**	J	**2500**		**4570**		**480**		**2930**		**10200**		**1760**	
LEAD	10.9	400	400	0.62	U	**3**	J	**1.8**	J	**4.3**	J	0.81	U	**1.3**	J	**1.7**	J	1.3	U	0.48	U	**6.3**	J	**0.65**	J
MAGNESIUM	16991	NE	NE	**1930**	J	**8090**		**2420**	J	**5150**	J	**2460**	J	**5130**		**2920**		**4240**		**1090**	J	**11500**		**1250**	J
MANGANESE	393	1800	1860	**24.8**		**167**		**67.4**		**269**	J	**70.4**	J	**50.5**		**65.4**		**10.6**		**178**		**209**		**27.4**	
MERCURY	0.0108	10	15.6	0.01	U	0.0098	U	0.0097	U	0.01	U	0.0096	U	0.01	U	0.0094	U	0.0096	U	0.01	U	0.0097	U	0.0099	U
NICKEL	17.4	1500	1560	**1.2**	J	**5.6**	J	**2.4**	J	**8.1**	J	**2.6**	J	**2.4**	J	**3**	J	**1.1**	J	**2.2**	J	**8.4**	J	**1.1**	J
POTASSIUM	5077	NE	NE	**460**	J	**1770**	J	**953**	J	**2470**	J	**811**	J	**1070**	J	**914**	J	**398**	J	**448**	J	**3110**	J	**443**	J
SELENIUM	1.4	390	391	2.5	U	2.5	U	2.1	U	2.2	U	3.2	U	2.2	U	2.3	U	5.1	U	1.9	U	2.2	U	2	U
SILVER	1.1	390	391	0.62	U	0.62	U	0.53	U	0.55	U	0.4	U	0.55	U	0.58	U	0.64	U	0.48	U	0.55	U	0.5	U
SODIUM	5196	NE	NE	680	U	680	U	580	U	**934**	J	**601**	J	**1280**	J	640	U	**1970**	J	**649**	J	**3250**	J	**889**	J
THALLIUM	1.3	0.78	0.782	1.6	U	1.6	U	1.4	U	1.4	U	2.1	U	1.4	U	1.5	U	3.3	U	1.3	U	1.4	U	1.3	U
VANADIUM	42.6	390	391	**3.2**	J	**13.9**	J	**7.5**	J	**18.8**	J	**6.3**	J	**9.2**	J	**6.7**	J	2.9	J	**7.5**	J	**15.3**	J	**3.1**	J
ZINC	54.6	23000	23500	**3.2**	J	**15.3**		**13.3**		**19.3**	J	**6**	J	**8.6**	J	**8.5**	J	6.4	U	**3.2**	J	**29.2**		**4.3**	J

Table 4-1
Soil Analytical Data
Building 924 (OT-C532) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC532-IS-0001-071612		OTC532-IS-0002-071612		OTC532-IS-0003-071612		OTC532-IS-0004-071612		OTC532-IS-0005-071612-FD		OTC532-IS-0006-071612		OTC532-IS-0007-071612		OTC532-IS-0008-071612		OTC532-IS-0009-071612		OTC532-IS-0010-071612		OTC532-IS-0011-071612	
				Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		9 - 11	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																										
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93		0.0089	U	0.0087	U	0.0082	U	0.0083	U	0.0084	U	0.0086	U	0.0084	U	0.0085	U	0.0087	U	0.0081	U	0.0088	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49		0.011	U	0.011	U	0.01	U	0.01	U	0.01	U	0.011	U	0.011	U	0.011	U	0.011	U	0.01	U	0.011	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49		0.011	U	0.011	U	0.01	U	0.01	U	0.01	U	0.011	U	0.011	U	0.011	U	0.011	U	0.01	U	0.011	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22		0.0089	U	0.0087	U	0.0082	U	0.0083	U	0.0084	U	0.0086	U	0.0084	U	0.0085	U	0.0087	U	0.0081	U	0.0088	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22		0.0089	U	0.0087	U	0.0082	U	0.0083	U	0.0084	U	0.0086	U	0.0084	U	0.0085	U	0.0087	U	0.0081	U	0.0088	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12		0.0089	U	0.0087	U	0.0082	U	0.0083	U	0.0084	U	0.0086	U	0.0084	U	0.0085	U	0.0087	U	0.0081	U	0.0088	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22		0.0089	U	0.0087	U	0.0082	U	0.0083	U	0.0084	U	0.0086	U	0.0084	U	0.0085	U	0.0087	U	0.0081	U	0.0088	U
PETROLEUM HYDROCARBONS (mg/kg)																										
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000		4	U	3.3	U	3.8	U	3.6	U	2.9	U	3.6	U	3.1	U	3.6	U	3.2	U	3.4	U	3.2	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000		4.4	U	4.3	U	4.1	U	4.2	U	4.2	U	4.3	U	4.3	U	4.2	U	4.3	U	**22.6**		4.3	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000		4.4	U	4.3	U	4.1	U	4.2	U	4.2	U	4.3	U	4.3	U	4.2	U	4.3	U	**5.78**	J	4.3	U
CYANIDE (mg/kg)																										
CYANIDE	NE	22.0	46.9		0.079	U	0.076	U	0.074	U	0.073	U	0.073	U	0.078	U	0.077	U	0.074	U	0.075	U	0.073	U	**0.087**	J
TRITIUM (pCi/g)																										
TRITIUM	NE	NE	NE		5.21	U	5.28	U	4.96	U	5.19	U	5.1	U	5.22	U	5.24	U	4.92	U	5.16	U	5.33	U	4.88	U

Table 4-1
Soil Analytical Data
Buidling 924 (OT-C532) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, February, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RCRA = Resource Recovery and Conservation Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Table 4-2
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	LDY-IDW01-090412	
		Sample Date	9/4/2012	
		Sample Type	Waste Characterization	
		40 CFR 261 Waste Characteristic Criteria	Result	Lab Qual
General Chemistry				
Corrosivity as pH	pH Units	> 2 and < 12.5	**7.7**	
Cyanide Reactivity	mg/kg	< 250	1.5	U
Ignitability (Flashpoint)	°F	> 140 °F	>200	
Solids, Percent	%	NA	**84.4**	
Sulfide Reactivity	mg/kg	< 500	59	U
TCLP Volatiles				
Benzene	mg/L	0.5	0.0020	U
Chlorobenzene	mg/L	100	0.0020	U
Chloroform	mg/L	6	0.0022	U
Carbon tetrachloride	mg/L	0.5	0.0025	U
1,1-Dichloroethylene	mg/L	0.7	0.0023	U
1,2-Dichloroethane	mg/L	0.5	0.0020	U
p-Dichlorobenzene	mg/L	7.5	0.0023	U
Methyl ethyl ketone	mg/L	200	0.020	U
Tetrachloroethylene	mg/L	0.7	0.0025	U
Trichloroethylene	mg/L	0.5	0.0026	U
Vinyl chloride	mg/L	0.2	0.0022	U
TCLP Semivolatiles				
2-Methylphenol	mg/L	200	0.0054	U
3&4-Methylphenol	mg/L	200	0.011	U
Pentachlorophenol	mg/L	100	0.054	U
2,4,5-Trichlorophenol	mg/L	400	0.0050	U
2,4,6-Trichlorophenol	mg/L	2	0.0050	U
1,4-Dichlorobenzene	mg/L	7.5	0.0100	U
2,4-Dinitrotoluene	mg/L	0.13	0.0050	U
Hexachlorobenzene	mg/L	0.13	0.0056	U
Hexachlorobutadiene	mg/L	0.5	0.0100	U
Hexachloroethane	mg/L	3	0.010	U
Nitrobenzene	mg/L	2	0.0059	U
Pyridine	mg/L	100	0.016	U
TCLP Metals				
Arsenic	mg/L	5	0.020	U
Barium	mg/L	100	**0.12**	J
Cadmium	mg/L	1	0.010	U
Chromium	mg/L	5	0.010	U
Lead	mg/L	5	0.010	U
Mercury	mg/L	0.2	0.00050	U
Selenium	mg/L	1	0.020	U
Silver	mg/L	5	0.010	U

Table 4-2
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

°F = degrees Fahrenheit
> = greater than
< = less than
% = percent
CFR = Code of Federal Regulations
J = estimated value
Lab Qual = laboratory qualifier
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
NA = not applicable
TCLP = Toxicity Characteristic Leaching Procedure
U = not detected at the detection limit shown

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles				
Acetone	µg/L	NE	10	U
Benzene	µg/L	5	0.21	U
Bromodichloromethane	µg/L	80	0.20	U
Bromoform	µg/L	80	0.34	U
Chlorobenzene	µg/L	100	0.20	U
Chloroethane	µg/L	NE	0.50	U
Chloroform	µg/L	80	0.26	U
Carbon disulfide	µg/L	NE	0.49	U
Carbon tetrachloride	µg/L	5	0.31	U
Cyclohexane	µg/L	NE	0.48	U
1,1-Dichloroethane	µg/L	NE	0.21	U
1,1-Dichloroethylene	µg/L	7	0.20	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.71	U
1,2-Dibromoethane	µg/L	0.05	0.30	U
1,2-Dichloroethane	µg/L	5	0.22	U
1,2-Dichloropropane	µg/L	5	0.26	U
Dibromochloromethane	µg/L	80	0.20	U
Dichlorodifluoromethane	µg/L	NE	0.50	U
cis-1,2-Dichloroethylene	µg/L	70	**0.42**	J
cis-1,3-Dichloropropene	µg/L	NE	0.22	U
m-Dichlorobenzene	µg/L	NE	0.25	U
o-Dichlorobenzene	µg/L	600	0.22	U
p-Dichlorobenzene	µg/L	75	0.20	U
trans-1,2-Dichloroethylene	µg/L	100	0.23	U
trans-1,3-Dichloropropene	µg/L	NE	0.21	U
Ethylbenzene	µg/L	700	0.29	U
Freon 113	µg/L	NE	0.33	U
2-Hexanone	µg/L	NE	2.0	U
Isopropylbenzene	µg/L	NE	0.20	U
4-Methyl-2-pentanone	µg/L	NE	2.3	U
Methyl Acetate	µg/L	NE	5.0	U
Methyl bromide	µg/L	NE	0.79	U
Methyl chloride	µg/L	NE	0.50	U
Methylcyclohexane	µg/L	NE	0.20	U
Methylene chloride	µg/L	5	2.0	U
Methyl ethyl ketone	µg/L	NE	3.1	U
Methyl Tert Butyl Ether	µg/L	NE	0.21	U
Styrene	µg/L	100	0.20	U

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles (continued)				
1,1,1-Trichloroethane	µg/L	200	0.20	U
1,1,2,2-Tetrachloroethane	µg/L	NE	0.24	U
1,1,2-Trichloroethane	µg/L	5	0.20	U
1,2,4-Trichlorobenzene	µg/L	70	0.50	U
Tetrachloroethylene	µg/L	5	0.32	U
Toluene	µg/L	1000	0.20	U
Trichloroethylene	µg/L	5	0.31	U
Trichlorofluoromethane	µg/L	NE	0.50	U
Vinyl chloride	µg/L	2	0.44	U
Xylene (total)	µg/L	10000	0.50	U
Semivolatiles				
2-Chlorophenol	µg/L	NE	0.68	U
4-Chloro-3-methyl phenol	µg/L	NE	0.78	U
2,4-Dichlorophenol	µg/L	NE	0.67	U
2,4-Dimethylphenol	µg/L	NE	0.74	U
2,4-Dinitrophenol	µg/L	NE	5.0	U
4,6-Dinitro-o-cresol	µg/L	NE	1.4	U
2-Methylphenol	µg/L	NE	0.69	U
3&4-Methylphenol	µg/L	NE	1.3	U
2-Nitrophenol	µg/L	NE	0.65	U
4-Nitrophenol	µg/L	NE	4.8	U
Pentachlorophenol	µg/L	1	4.8	U
Phenol	µg/L	NE	0.53	U
2,4,5-Trichlorophenol	µg/L	NE	0.86	U
2,4,6-Trichlorophenol	µg/L	NE	0.75	U
Acenaphthene	µg/L	NE	0.67	U
Acenaphthylene	µg/L	NE	0.67	U
Acetophenone	µg/L	NE	0.72	U
Anthracene	µg/L	NE	0.72	U
Atrazine	µg/L	3	0.83	U
Benzaldehyde	µg/L	NE	4.8	U
Benzo(a)anthracene	µg/L	NE	0.52	U
Benzo(a)pyrene	µg/L	0.2	0.55	U
Benzo(b)fluoranthene	µg/L	NE	0.73	U
Benzo(g,h,i)perylene	µg/L	NE	0.64	U
Benzo(k)fluoranthene	µg/L	NE	0.64	U
4-Bromophenyl phenyl ether	µg/L	NE	0.76	U
Butyl benzyl phthalate	µg/L	NE	0.68	U
1,1'-Biphenyl	µg/L	NE	0.92	U
2-Chloronaphthalene	µg/L	NE	0.70	U

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Semivolatiles (continued)				
4-Chloroaniline	µg/L	NE	0.66	U
Caprolactam	µg/L	NE	2.4	U
Carbazole	µg/L	NE	0.50	U
Chrysene	µg/L	NE	0.56	U
bis(2-Chloroethoxy)methane	µg/L	NE	0.67	U
bis(2-Chloroethyl)ether	µg/L	NE	0.69	U
bis(2-Chloroisopropyl)ether	µg/L	NE	0.76	U
4-Chlorophenyl phenyl ether	µg/L	NE	0.84	U
2,4-Dinitrotoluene	µg/L	NE	0.66	U
2,6-Dinitrotoluene	µg/L	NE	0.77	U
3,3'-Dichlorobenzidine	µg/L	NE	0.71	U
Dibenzo(a,h)anthracene	µg/L	NE	0.56	U
Dibenzofuran	µg/L	NE	0.72	U
Di-n-butyl phthalate	µg/L	NE	0.96	U
Di-n-octyl phthalate	µg/L	NE	0.96	U
Diethyl phthalate	µg/L	NE	0.96	U
Dimethyl phthalate	µg/L	NE	0.77	U
bis(2-Ethylhexyl)phthalate	µg/L	6	1.1	U
Fluoranthene	µg/L	NE	0.56	U
Fluorene	µg/L	NE	0.73	U
Hexachlorobenzene	µg/L	1	0.66	U
Hexachlorobutadiene	µg/L	NE	0.92	U
Hexachlorocyclopentadiene	µg/L	50	0.76	U
Hexachloroethane	µg/L	NE	0.71	U
Indeno(1,2,3-cd)pyrene	µg/L	NE	0.55	U
Isophorone	µg/L	NE	0.61	U
2-Methylnaphthalene	µg/L	NE	0.66	U
2-Nitroaniline	µg/L	NE	0.72	U
3-Nitroaniline	µg/L	NE	0.62	U
4-Nitroaniline	µg/L	NE	0.93	U
Naphthalene	µg/L	NE	0.61	U
Nitrobenzene	µg/L	NE	0.69	U
N-Nitroso-di-n-propylamine	µg/L	NE	0.82	U
N-Nitrosodiphenylamine	µg/L	NE	0.96	U
Phenanthrene	µg/L	NE	0.68	U
Pyrene	µg/L	NE	0.65	U
Petroleum Hydrocarbons				
Gasoline Range Organics (C6-C10)	mg/L	NE	0.05	U
Diesel Range Organics (C10-C28)	mg/L	NE	**0.115**	J
Oil Range Organics (C28-C40)	mg/L	NE	0.10	U

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Metals				
Aluminum	µg/L	NE	**36.2**	J
Antimony	µg/L	6	**6.7**	J
Arsenic	µg/L	10	2.5	U
Barium	µg/L	2000	**29.1**	J
Beryllium	µg/L	4	0.50	U
Cadmium	µg/L	5	1.0	U
Calcium	µg/L	NE	**654,000**	
Chromium	µg/L	100	4	U
Cobalt	µg/L	NE	**6.2**	J
Copper	µg/L	1300	**2.9**	J
Iron	µg/L	NE	**97.5**	J
Lead	µg/L	15	2.2	U
Magnesium	µg/L	NE	**310,000**	
Manganese	µg/L	NE	**179**	
Mercury	µg/L	2	0.03	U
Nickel	µg/L	NE	**3.7**	J
Potassium	µg/L	NE	**16,500**	
Selenium	µg/L	50	4.0	U
Silver	µg/L	NE	0.50	U
Sodium	µg/L	NE	**762,000**	
Thallium	µg/L	2	0.078	U
Vanadium	µg/L	NE	**4.5**	J
Zinc	µg/L	NE	**12.8**	J

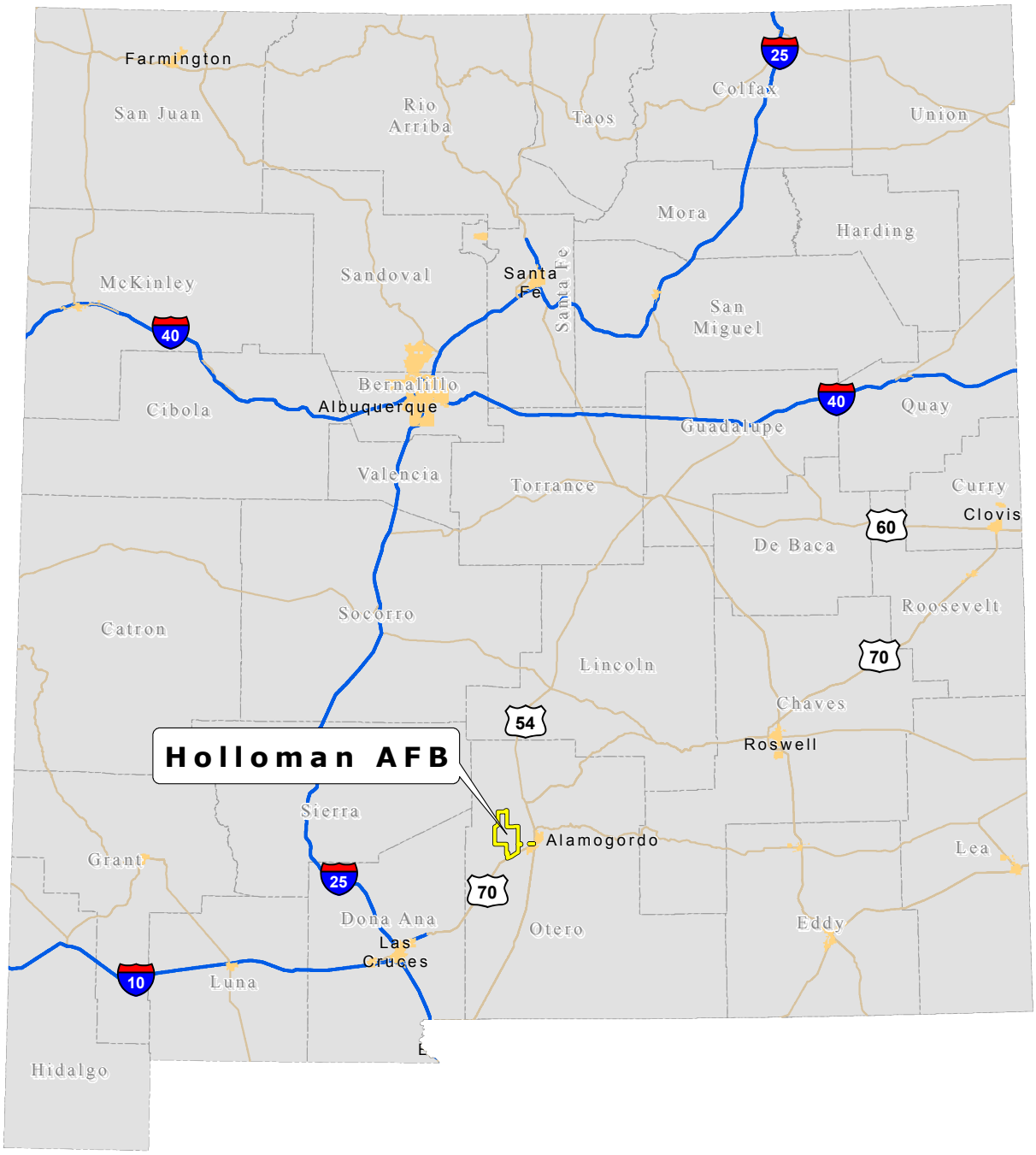
Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

[a] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

EPA = U.S. Environmental Protection Agency.
J = estimated value.
MCL = maximum contaminant level.
µg/L = micrograms per liter.
mg/L = milligrams per liter.
NE = not established
RSL = regional screening level.
U = not detected at the detection limit shown.
VQ = validation qualifier.

Figures



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Date: 8/28/2013

Approved By: BFoss

Checked By: CLong

Drawn By: BGrod

Office: Hou

Legend

Holloman AFB

N

WGS 84 UTM Zone 13N Meters

0 20 40 80
Kilometers

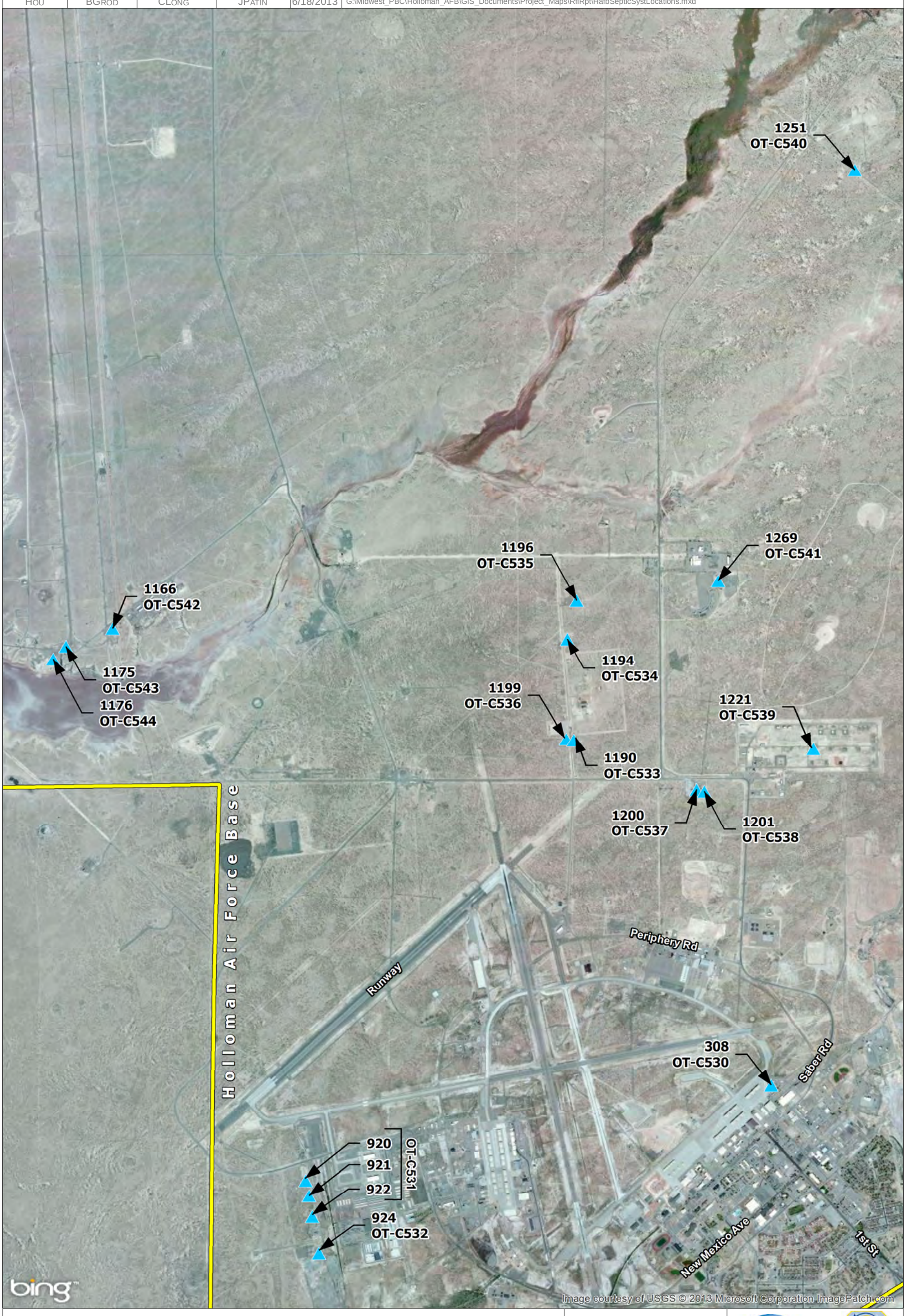
0 10 20 40
Miles

Figure 1-1

Holloman Air Force Base Location

Holloman AFB, New Mexico

Office	Drawn By	Checked By	Approved By	Date	File Path
Hou	BGrod	CLong	JPatin	6/18/2013	G:\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbSepticSystLocations.mxd



LEGEND

- Holloman AFB
- Septic Tank System

N

WGS 84 UTM Zone 13N
Meters

1 inch = 2,800 feet

0 700 1,400 2,800
Feet

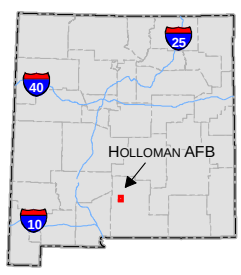
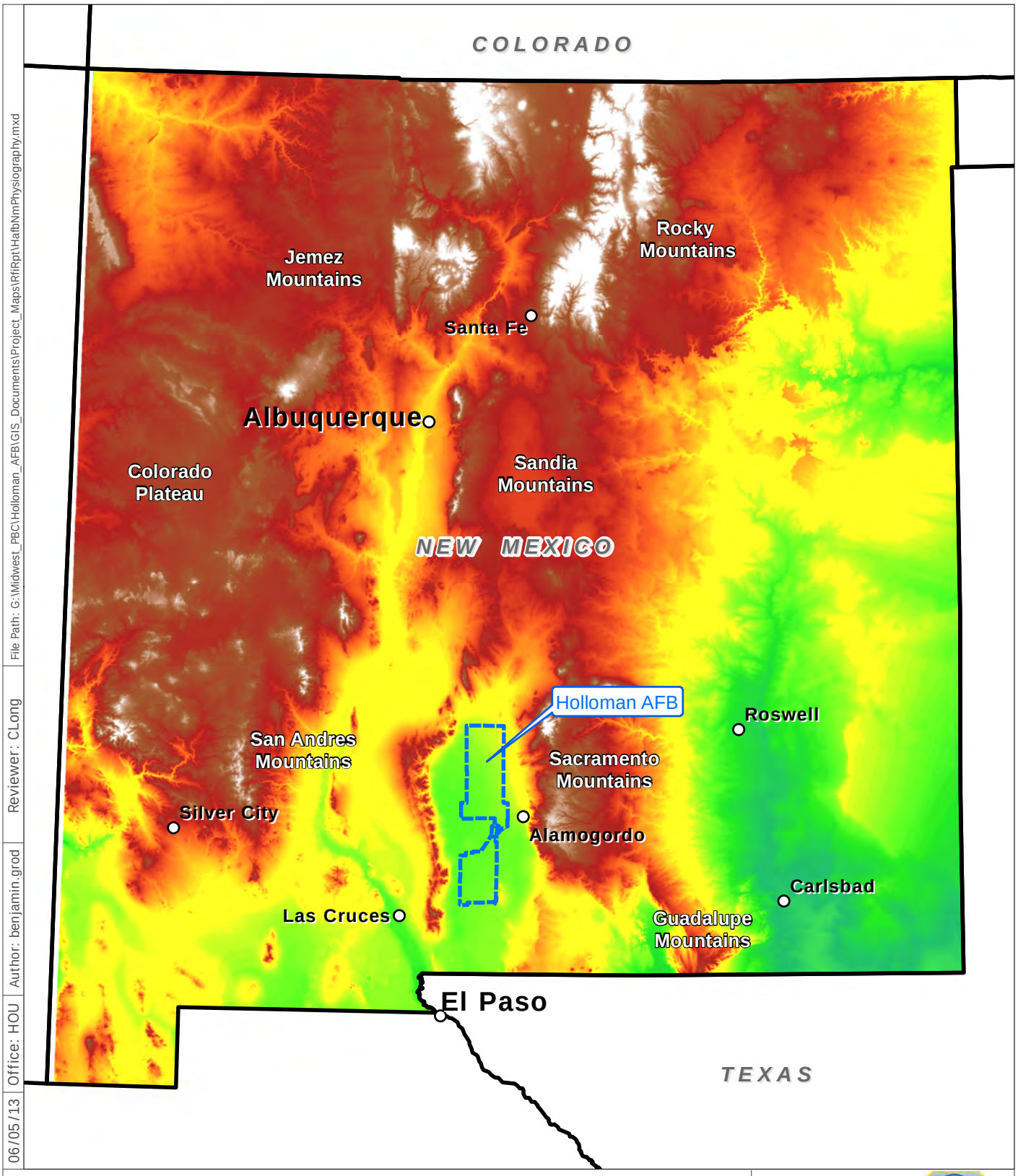


Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
Holloman AFB, NM



File Path: G:\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbNmPhysiography.mxd
Reviewer: CLong
Author: benjamin.grod
Office: HOU
06/05/13

Legend

Holloman Air Force Base (AFB) Installation Area

Elevation
- High : 3,936 meters
- Low : 0 meters

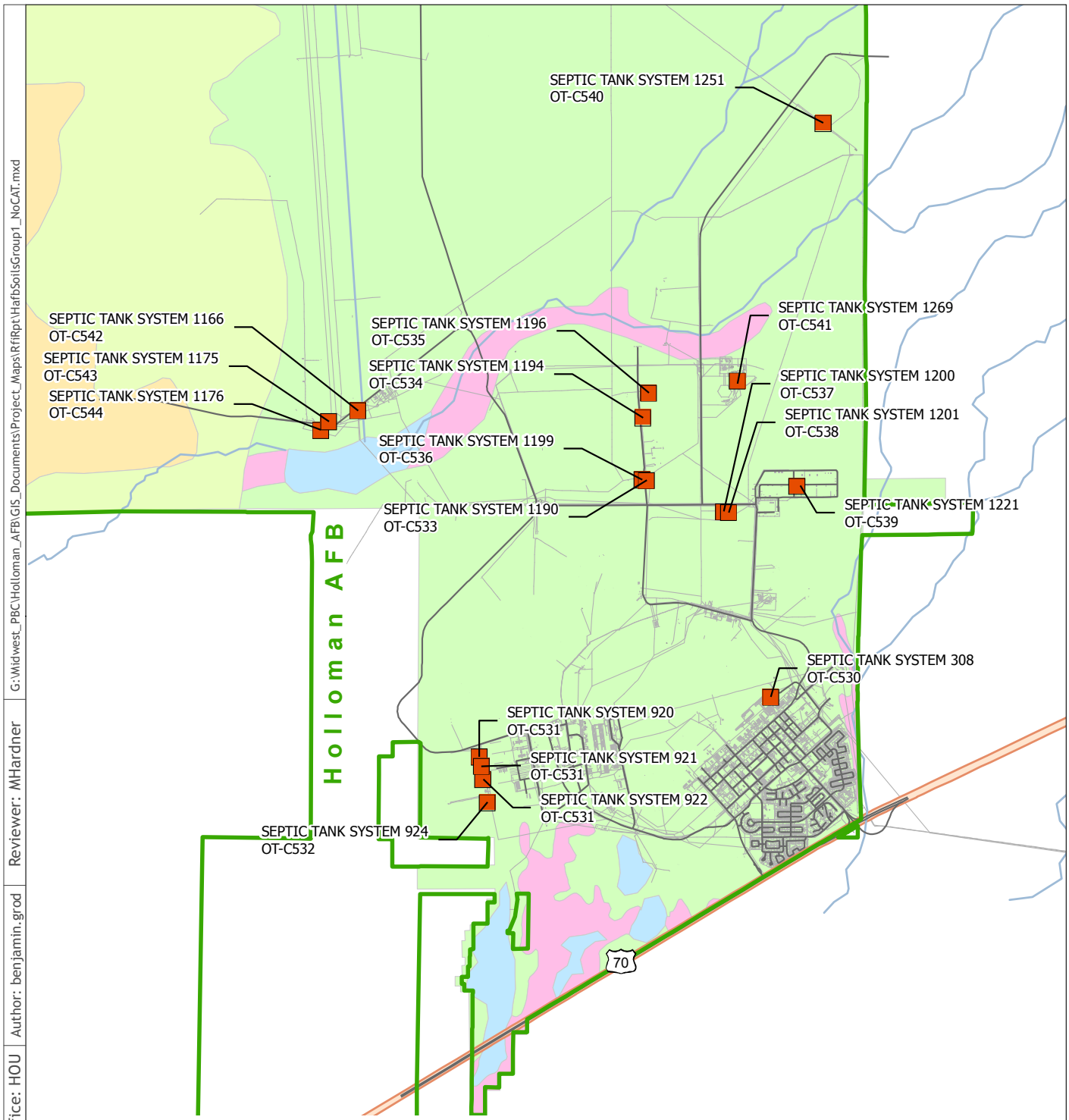
NAD 83 SPCS
New Mexico Central
Feet

0 50
Miles

Figure 2-1

Physiographic Map

Holloman AFB, New Mexico



Note:
1) Soils types at Holloman Air Force Base, New Mexico are based on United States Department of Agriculture (USDA) Soil Conservation Service Classifications. Source USDA, 1981

06/18/13 | Office: HOU | Author: benjamin.grod | Reviewer: MHardner | G:\Widwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbSoilsGroup1_NoCAT.mxd

Legend

- Installation Area
- Group 1 Septic Tank Sites
- Surface Water
- Active Dune Land Gypsum
- Duneland Yesum Association
- Holloman-Gypsum Land-Yesum complex
- Intermittent Water
- Mead Silty Clay Loam
- Rock Land Warm

NAD 83 SPCS
New Mexico Central
Feet

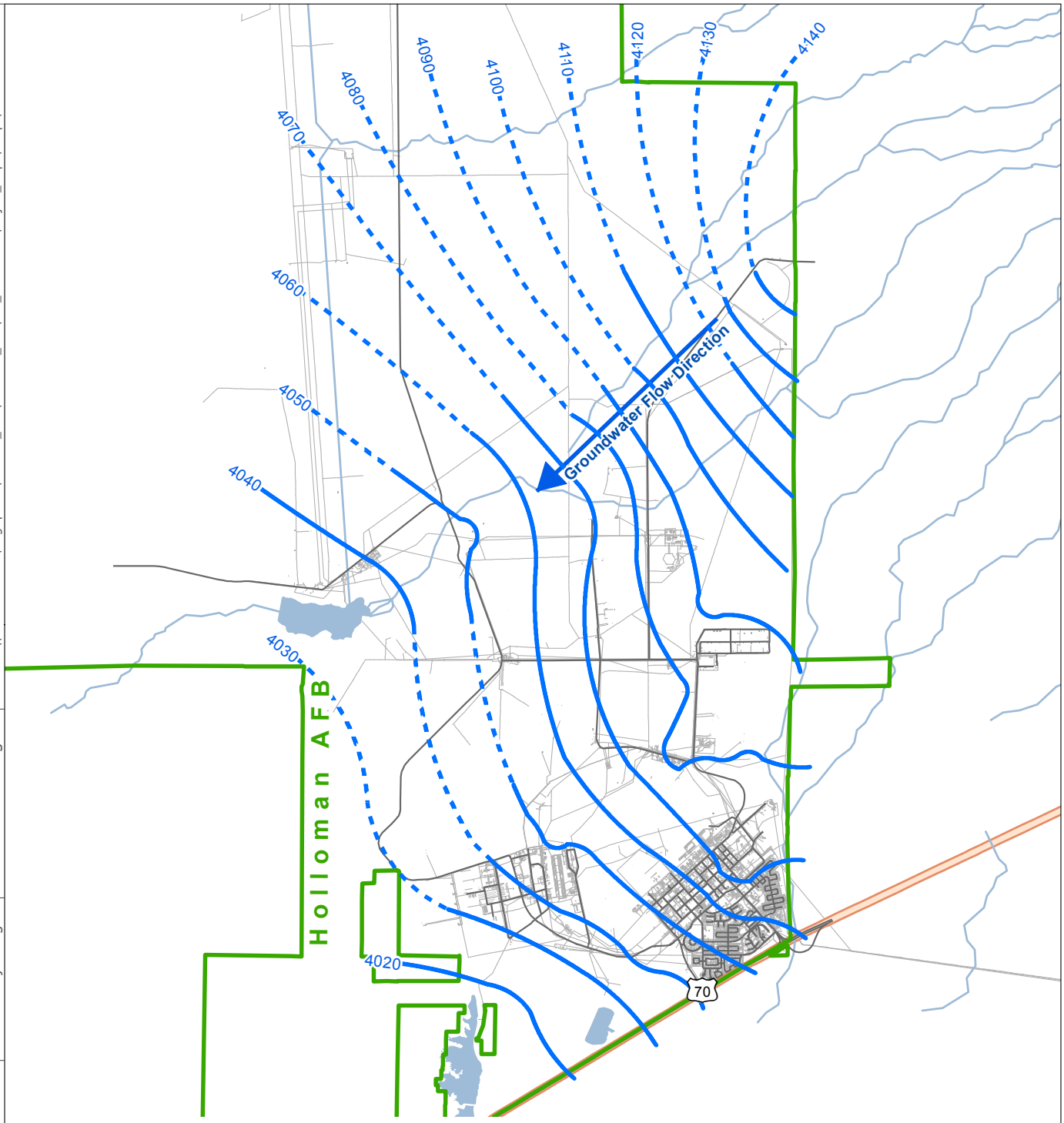
0 7,000
Feet

CBI

Figure 2-2

Septic Systems Soils Map

Holloman AFB, New Mexico



Note:
1) Groundwater contour map showing groundwater elevation contours across Holloman Air Force Base, New Mexico, are based on 2002 measurements taken from the shallow aquifer.
2) Source: Holloman AFB GIS, 2002 LTM.

08/28/13 | Office: HOU | Author: benjamin.grod | Reviewer: CLong | File Path: \\cfsfs01.cfs.com\arcgisprod2\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbGw2002.mxd

Legend

- Installation Area
- Groundwater Flow Direction
- Groundwater Elevation Contour (ft) (Dashed where inferred)
- Surface Water

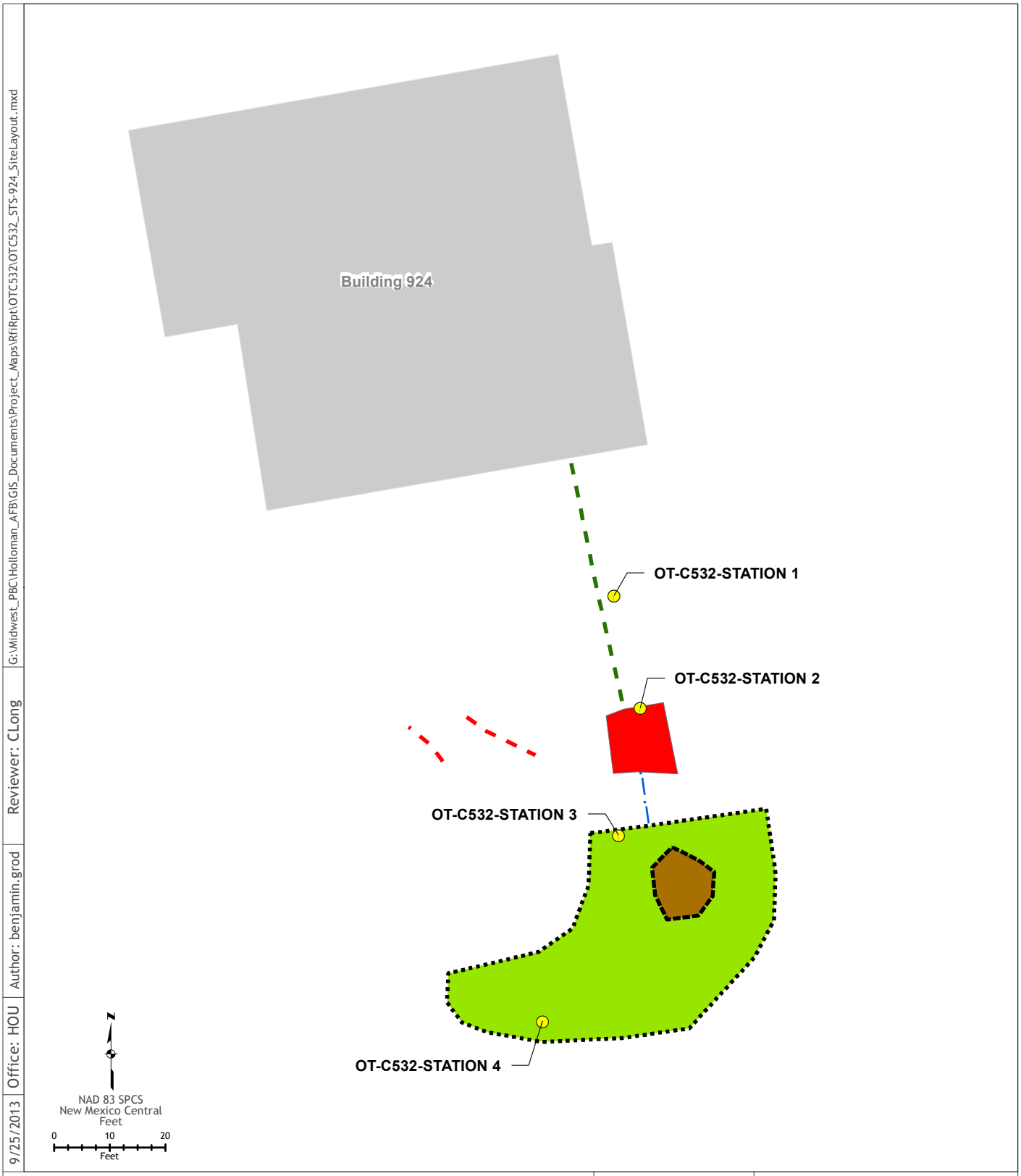
NAD 83 SPCS
New Mexico Central
Feet

0 8,000
Feet

Figure 2-3

Regional Groundwater Contour Map

Holloman AFB, New Mexico



Legend

- Soil Boring Station
- Effluent Line
- Influent Line
- Electric Utility
- Abandoned Septic Tank
- Leach Field
- Open Hole and Void
- Building

Note: The observed hole and/or underground void was observed during the survey, however the method of formation is unknown.

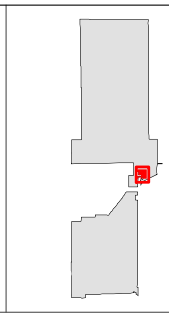


Figure 3-1

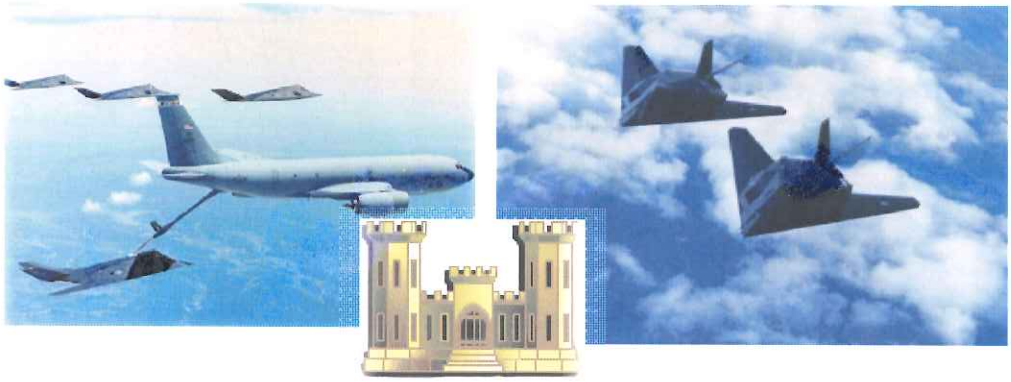
Site Layout and
Sampling Locations
Building 924
Septic Tank System OT-C532

Holloman AFB, New Mexico

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-067

Appendix A
Historical Records

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS



Holloman Air Force Base
New Mexico

APRIL 2007

Headquarters, Air Combat Command
Langley Air Force Base, Virginia

49 CES/CEV
Holloman Air Force Base, New Mexico

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH FIGHTER WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

APR 27 2007

MEMORANDUM FOR NEW MEXICO ENVIRONMENT DEPARTMENT
Attn: Mr. James P. Bearzi
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe NM 87505-6303

FROM: 49 CES/CEV
550 Tabosa Ave.
Holloman AFB NM 88330-8458

SUBJECT: Submittal of Information Required by NMED Letter of August 30, 2006
Septic Tanks and Associated Drain Fields, Holloman AFB
EPA ID# NM6572124422

1. Pursuant to Part 4, Condition IV.B.3 of Permit No. NM6572124422, Holloman AFB is submitting the final portion of the required information.

2. This final portion of the required information covers the history of the facilities served by each septic tank and, based on the historic activities that occurred in each facility, the possible wastes that were discharged into the septic systems.

3. If you have any questions or comments, please contact Mr. Dave Griffin or Mr. George Fish at (505) 572-3931.

DEBORAH J. HARTELL
Chief, Environmental Flight

cc: w/Attachments
Mr. Cornelius Amindyas
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

Mr. David Strasser
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS
HISTORY

Holloman's records show a list of fifty seven (57) septic tank systems broken into three categories- Active Septic Systems, Inactive Septic Systems, and Removed Septic Systems. The systems are identified by the Building number they are/were attached to. There are twenty five (25) Active Septic Systems which are listed in this report. There are twenty one (21) Inactive Septic Systems that are listed and the history of activities in the building associated with the system is identified to the extent of available knowledge. There are eleven (11) Removed Septic Systems listed with histories based on available record knowledge.

The Active systems are identified, but no histories of the buildings are provided as this will likely change over time particularly with change in mission (aircraft on base) or tie-in to the base waste water treatment system. A history will be added to this list if and when the septic system is no longer needed and moved to the Inactive or Removed list.

The Inactive systems are scheduled for proper closure per guidance given in the NMED Liquid Waste Regulation 20.7.3.307 NMAC. This regulation calls for capping of the line(s) from the building to the septic tank, pumping out the tanks contents, penetration of the bottom of the tank, along with collapse of the tank roof and filling of the tank with sand or soil.

The septic systems on the Removed list have had the actual septic tank excavated and removed.

A search of Real Property records and the Historic Properties Inventory yielded the information available on the buildings. There was not information available on every building, but if new information becomes available, it will be added to the list.

Attachment 54a-e shows the current plan of where the sewer system lies to show what buildings are currently connected to Holloman's Sewer System. Any building that does not have an active septic tank is either abandoned or connect to Holloman's Sewer System.

ACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	149	1998		1000
2	312	1994		1000
3	375	1968		500
4	882			
5	864 (863)	1994	5'x8'x6'4"	750
6	885	1970	7'10"x4'8"x6'10"	1000
7	886			
8	887	1991		1000
9	923	1959	4'2"x7"x7'9.5"	1600
10	1022	1992		1200
11	1066	1994		1000
12	1160	1957	5'x12'4"x7'6"	1500
13	1161	1957		750
14	1162	1957		350
15	1163	1957		350
16	1169	1962		1680
17	1195	1962		1260
18	1256	1970	12'8"x4'8"x5'	
19	1270			
20	1271			
21	1278	2004		1250
22	1284			
23	1625			
24	75600	1989		1200
25	La Luz Gate (1290)(**1292**)	2004		1250

INACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	308	1965		
2	920	1959	4'2"x7"x7'9.5"	1600
3	921	1959	4'2"x7"x7'9.5"	1600
4	922	1959	4'2"x7"x7'9.5"	1600
5	924	1959	4'2"x7"x7'9.5"	1600
6	1091	1969	6'8"x3'x8'5"	
7	1097	1987	5'10"x5'x7'8"	1672
8	1190	1952	9'x4'x8'10"	3000
9	1194	1987	4'x4'x8'10"	1350
10	1196	1993	4'6"x11'x6'	1300
11	1199	1957		500
12	1200	1954	4'x8'x4'	1000
13	1201	1951	2'6"x6'6"x5'5"	650
14	1219	1985	5'4"x10'6"x8'4"	
15	1221	1983	4'8"x9'4"x6'2"	1100
16	1226	1985	5'6'2"x6'	
17	1235	1986		1189
18	1239	1977	4'6"x8'6"x6'	750
19	1250	1957		350
20	1251			
21	1269	1966	4'6"x9'	500

INACTIVE SEPTIC SYSTEMS

BUILDING 308

This is a 3200 SF building originally constructed in 1965. The original operation in the building was calibration of guided weapons for aircraft. In the 1970s and early 1980s the building was used as a nosedock for F-4 - Test Aircraft Radar electronic work area. It has never had a floor drain.
This facility is currently being used to store air craft support equipment for Building 309. The shop has been used in the past for servicing, inspecting, and repairing AGE equipment, but due to the reduction in personnel, this work is currently only performed in Building 309. The need to expand the work area for AGE equipment maintenance into Building 308 in the near future is not anticipated. A current view of the building is shown below in Figure 1.

Figure 1: Picture of Bldg. 308

Facilities associated with the septic system consist of:

- Toilet
- Lavatory
- Janitorial Sink

The building is located at 340 Delaware Ave. The point of contact for this building is Ms. Vicky Cruz and Mr. Adam Ferrara, they can be reached at 575-~~475~~-5272. The hours

572

of operation for this building when it is in use is one 8.5 hr shift (0630-1500) and one 9 hr shift (1500-2400), five days per week.

Industrial Wastewater Drainage: There are no floor or trench drains in this facility. A janitor's sink is located in the restroom. The sanitary sewer pipe from the restroom connects with the pipe from the restrooms in Building in 309. The effluent pipe then proceeds south to Manhole 334E the layout of this facility can be seen below in **Figure 2**. At the time of the inspection surveyors were unable to open Manhole 334E. No cross-connections to the storm sewer were identified.

Industrial Wastewater Sources/Existing Pretreatment/ Existing Management Practices: There is only once source of industrial wastewater from this facility: floor washing

Floor Washing: The floor in this facility is washed every three months using a Tennant floor scrubber, 10 gallons of water and Simple Green. Average and maximum daily wastewater flows from this activity are estimated to be less than one gallon and ten gallons, respectively. The wastewater from this activity is discharged into the French drain at Building 309; therefore, the quantity of wastewater generated by this activity is included in the flow summary for Building 309.

Existing management practices consist of sweeping the floor prior to washing it.

Site Description: Aircraft Corrosion Control
Site Specific Contingency Action Plan: See Attachment 1
Secondary Containment Routes: None
Probable Spill Route: Leaks dissipate in local area on ground
Material Compatibility: No material incompatibilities

Connected to Sewer?

Stored Substances:

Chemical	Container Type
MEK	1 gallon can
Polyurethane Paint	1 gallon can
Naptha	1 gallon can
Toluene	1 gallon can
Epoxy Primer	1 gallon can
PD-680 Type II	55 gallon drum
Waste Paint/Thinners	55 gallon drum

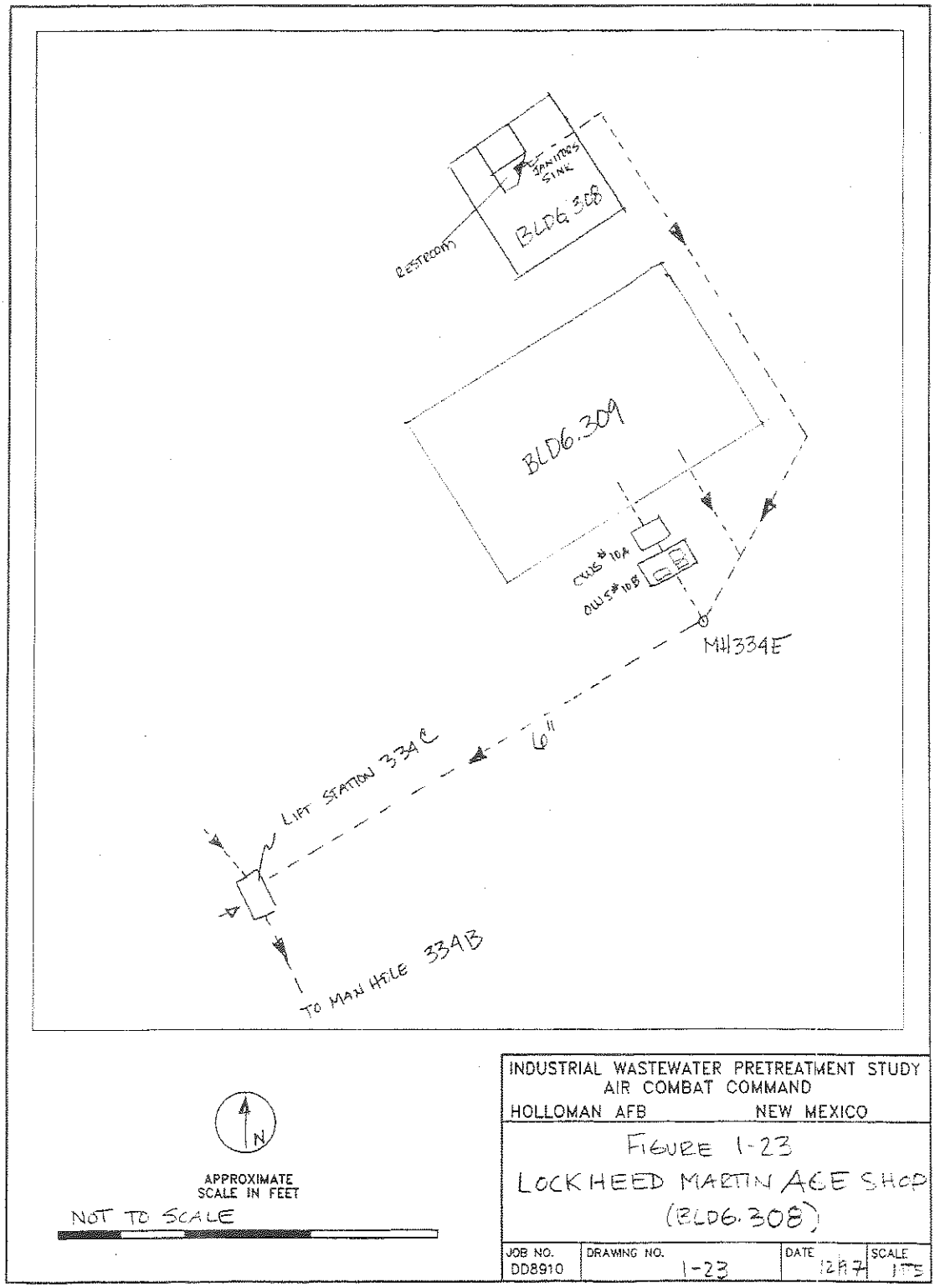


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Figure 2: Layout of Bldg. 308 and 309

INACTIVE SEPTIC SYSTEMS

BUILDINGS 920, 921, 922

These are three identical buildings constructed in 1959. Each building has 1900 SF. They were originally built for ammunition assembly which primarily consisted of bolting rocket components together prior to use. All three buildings are presently vacant and empty.
Each of the three buildings has a simple bathroom consisting of a:

- Toilet
- Lavatory

Multiple inspections were set up for this site, but no one showed up. Therefore, no follow-up information was found. Pictures of the current buildings are shown below in Figures 3-5.

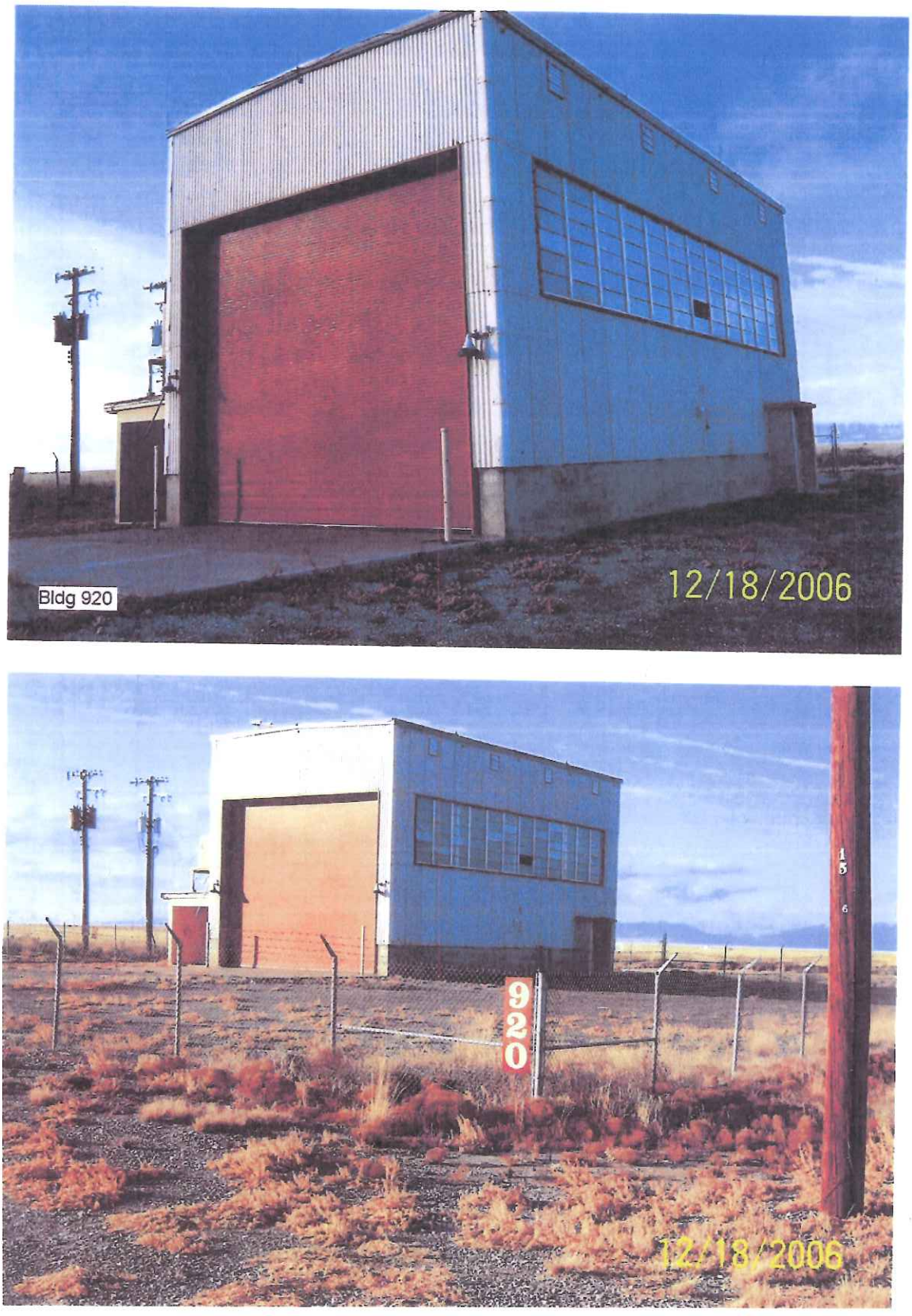


Figure 3: Pictures of Bldg. 920

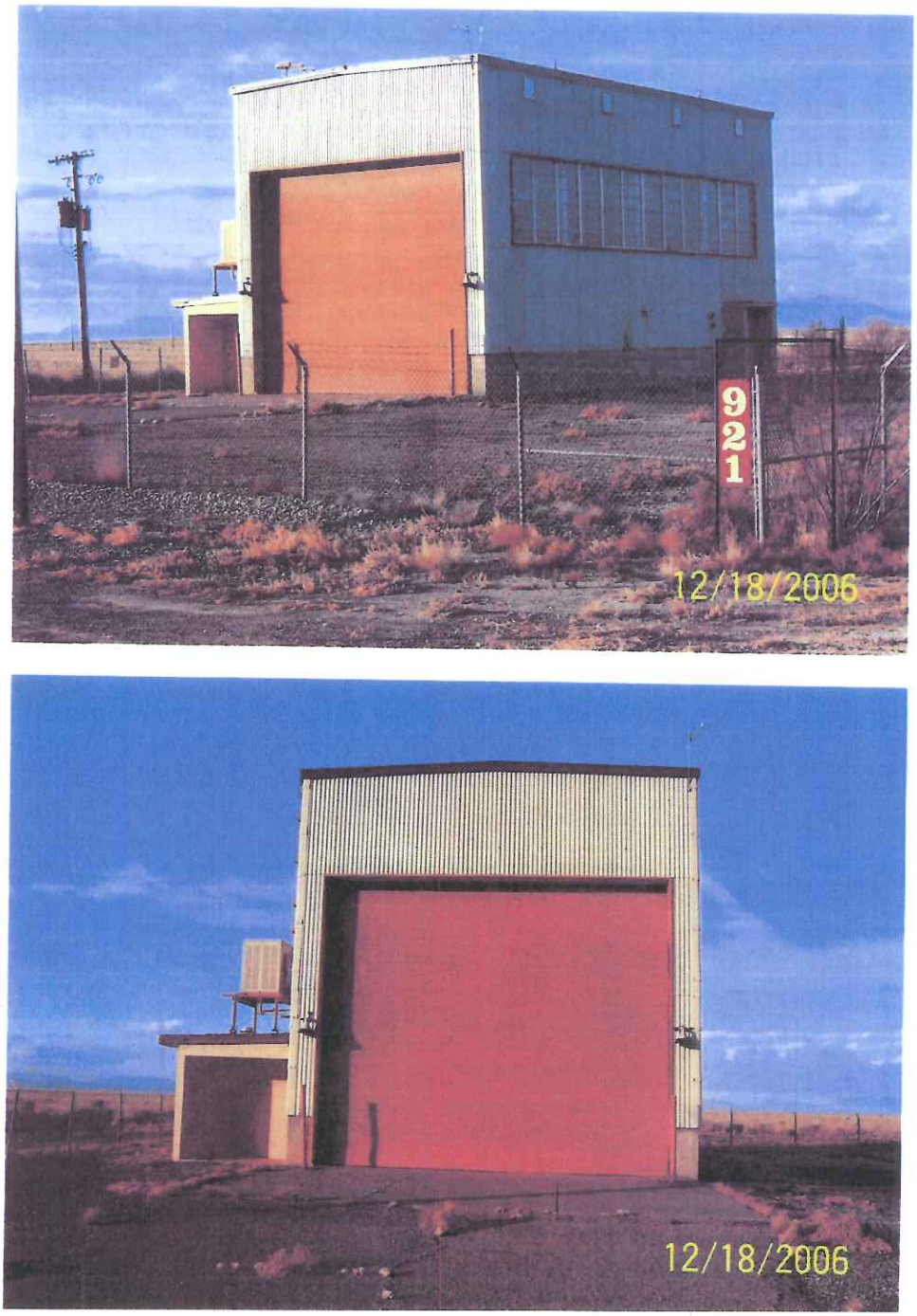


Figure 4: Pictures of Bldg. 921

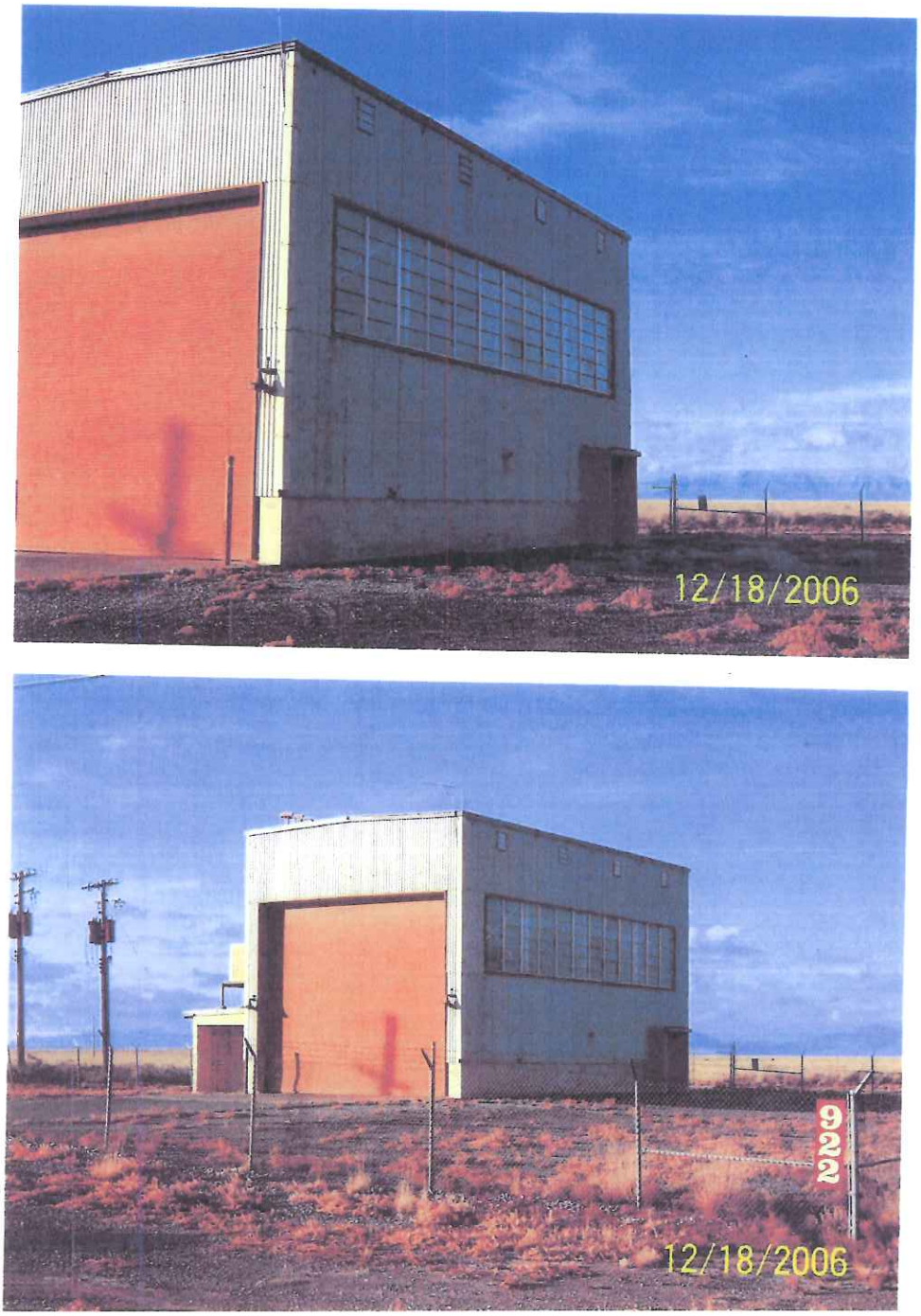


Figure 5: Pictures of Bldg. 922

INACTIVE SEPTIC SYSTEMS

BUILDING 924

This building was constructed in 1959 and has 4800 SF.
The building's original service was ammunition assembly similar to buildings 920-922.
It was later used for maintenance of radar tracking equipment.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

An on site inspection was done for this building on 20 Dec 2007 with the current facility manager, Mr. Michael Tackett. He did not have any information about the history of the septic tank system. Currently the building is being used for munitions storage. For the past two year it has stored rocket motors for the test track. From the on site inspection and drawings (Attachment 4-6) it can be seen that the bathroom drain is separate and there are no floor drains.

There are no pictures on file of this building.

INACTIVE SEPTIC SYSTEMS

BUILDING 1091

Site Description: There are no current files on this building because the building has been demolished. The building served as the Airfield Control Tower until replaced by the present Control Tower
On Attachment 55b a drawing of where the leach field was located in 1984 can be seen.
Grid Coordinates: J.9, 10.2
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: No secondary containment associated with underground storage tank
Probable Spill Route: Leakage from underground tank will contaminate water table in local vicinity

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 / UST

There were also three drawings that were discovered during the research stage of the project. The drawing (Attachment 7) shows the Septic Tank Details, Septic Tank Drain Field and the Drain Field Details.

INACTIVE SEPTIC SYSTEMS

BUILDING 1097

Specifications and history of this building are given in the following "Cold War Survey: Holloman Air Force Base". Along with this survey an on site inspection was done on 28 November 2007 with the current facility managers, A1C Clinton Bennett and TSgt Robert Edyburn. During the on site inspection it was discovered that the bathroom is separated from work area drains. In the past the building was used as a communications work center (office space) until 2005. There are no floor drains in the work area. It is currently being used as a houses base for a radio system network. There were also three drawings (Attachment 8-10) that were discovered in the investigation phase of the project. The drawings show the Materials Septic System, the Septic Tank Placement and Piping, the Latrine Plan, and the Mechanical Plumbing Plan.

Facilities in this building consist of:

- Toilet
- Urinal
- Lavatory

Description: Communications facility
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: None
Probable Spill Route: Leaks dissipate in local area on ground

Tank Location: South of facility
Fuel Flow – South/West

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 /AST
	500 gal each/ 1 /UST (Abandoned)

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Communications, Receiver.
Historic: Transmitter/Receiver.
Street Address: 1432 Sabre Road, HAFB, 88330-7842.

Building Number: 1097

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [ ] Minor [ ] Moderate [x] Major

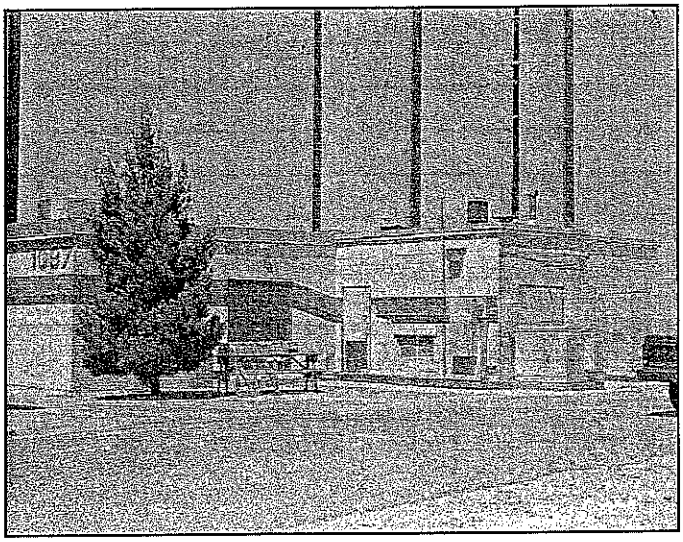
Comments:

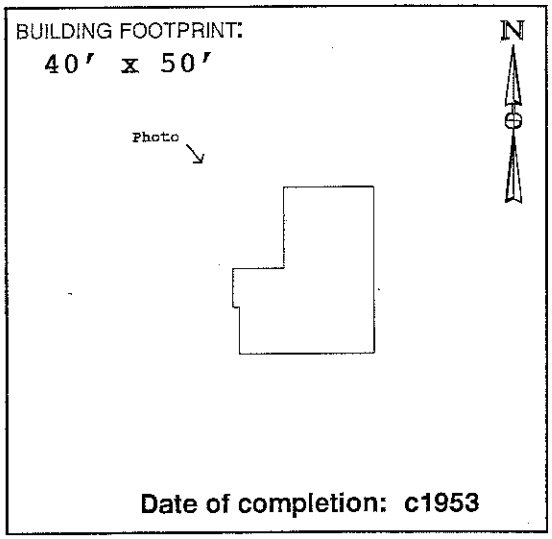
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1097 has not retained historic integrity.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1953

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1097 is a small transmitter building designed with few embellishments for utilitarian use only. Building 1097 originally had a rectangular footprint identical to Building 1098 and Building 1095. The original floor plan was sectioned into 4 rooms. An addition was constructed at the west elevation in 1986 using compatible structural and architectural components (CE File #1097-1). Both the builder and the architect are unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1097.

Current Function: Receiver/Air Traffic Control/Radio Control.

Original Function: Transmitter/Receiving/Communications.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1098-1 (c1952).

Foundation: Concrete wall footing. Concrete slab on granular fill.

Exterior walls: Painted concrete masonary units (CMU).

Roof: BUR on 2" rigid insul.; 2" poured gypsum on gyp board sup. by steel joists.

Notable interior features, including machinery:
Construction drawings document *"UHF Radio Air/Ground Facilities AN/GRC-27"*.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:
Continues to function as a communications facility/receiver site.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1097 has served as a Base communications facility since its completion c1953. Several renovations have resulted in a loss of historic integrity for this building. Building 1097 is no longer eligible for the National Register of Historic Places.

VII. ASSOCIATED BUILDINGS:

Location plan CE File #1098-2 identifies at least three north area transmitter sites. Building 1097 was associated with transmitter Building 1098. This facility is also associated with the flightline, and with communications Building 221.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building #1097 retains its original function as a radio receiver facility, however it has been modified to accommodate electrical, mechanical, and equipment additions and change-outs. Original equipment has been replaced.

Office space was added to the south elevation (1986: CE File #1097-1). All six windows at the north, east and west elevations have been blocked in. Original doors have been replaced. Vinyl floor tile covers original tile throughout. Dropped ceilings have been added.

This building, although retaining historic significance as a receiving site, has lost integrity of design, materials, workmanship, and association with its period of significance. Note: A Sgt. Boots (extension 3132) was identified by Building 1097 personnel as being a possible source for oral history research concerning specific activities associated with this facility.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Office space added to the west elevation (c1986: CE File #1097-1).

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Construction of adjacent buildings has altered viewshed.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Windows have been blocked in.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: An addition obscures the original west elevation. The original window treatments removed. Dropped ceilings added. Original asphalt floor tile covered.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: The presence of interior communications equipment and exterior poles contribute to the integrity of feeling as a radio site.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

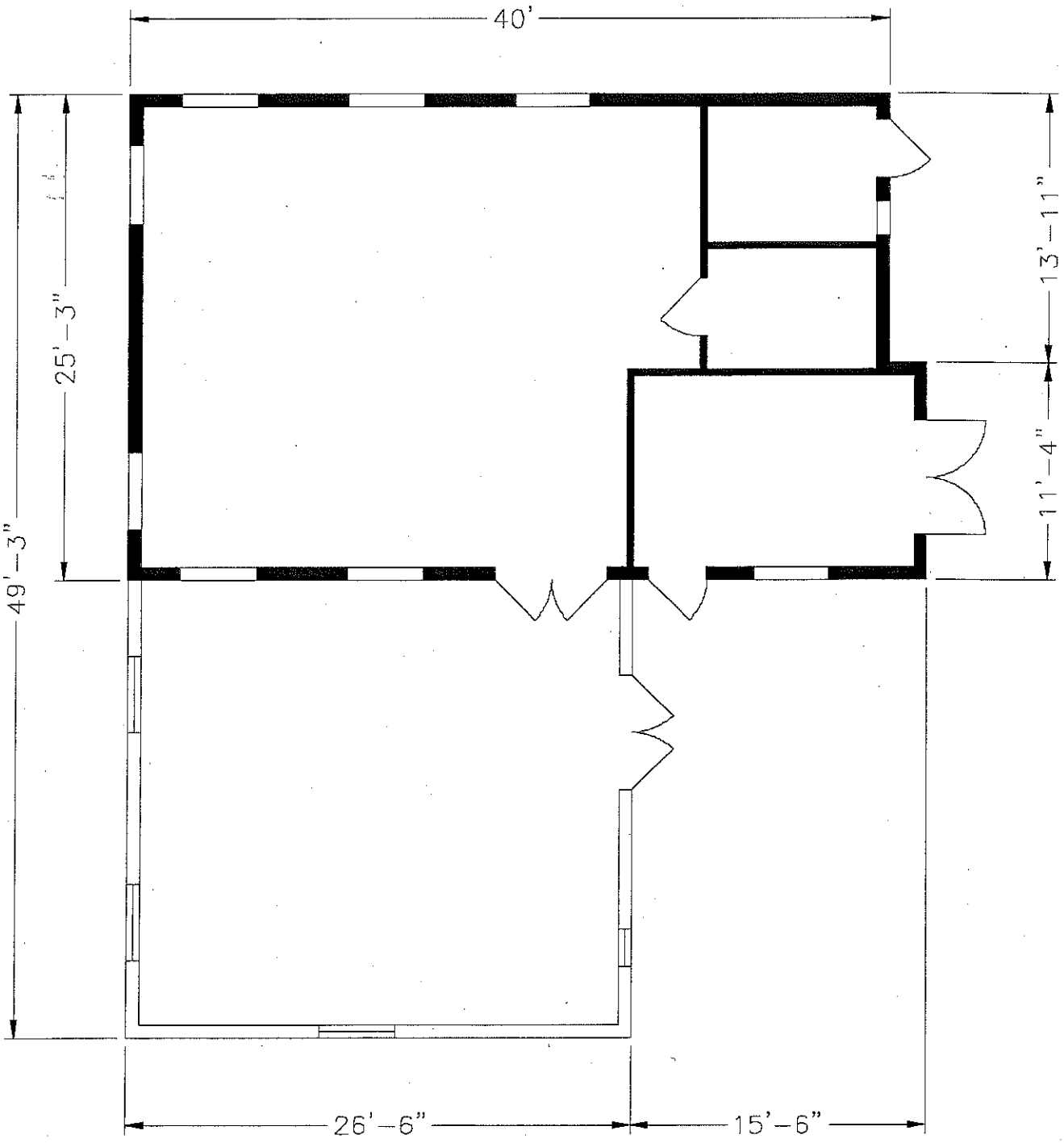
Comments: Original equipment has all been replaced.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #81**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



140

Source: CE File #1098-2 (c1971)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1097** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1190

This building was constructed in 1952 and demolished in 2002. Specifications and history are provided in the "Cold War Survey".

The only drawing discovered was the plumbing floor plan and it can be seen in Attachment 11. Attachment 55d shows the current location of the leach field in 1984.

2002 Demolished Due To Unrelated Condition

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Security Police Building.
Historic: Change House/Unconventional Fuel Storage.
Street Address: 1514 Lethal Road, HAFB, 88330-7840.

Building Number: 1190

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1190 is in need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

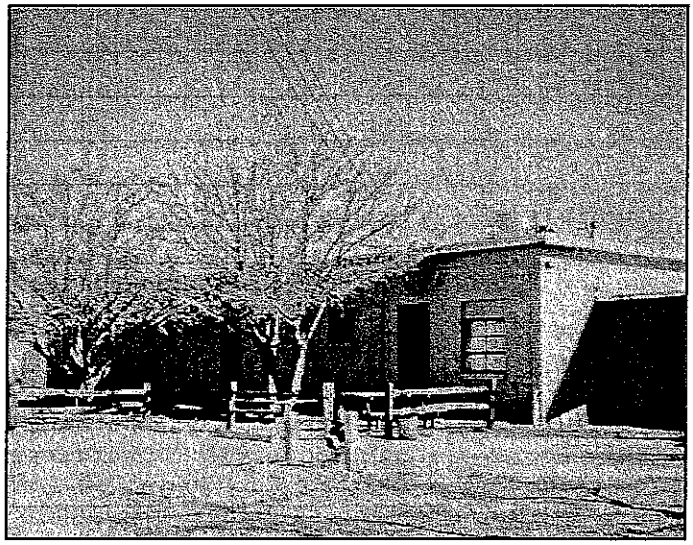
Comments: Interior partitions have been removed (date unknown).

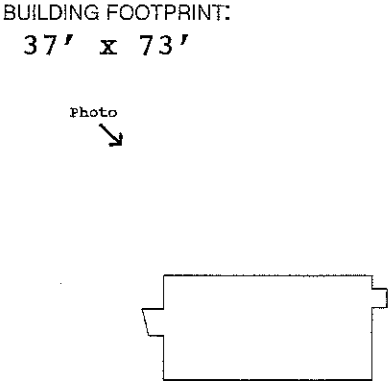
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1190 is a single-story, flat-roofed, concrete masonry unit (CMU) building exhibiting large roll-up equipment doors, numerous personnel access doors, and asymmetrical window fenestration. Construction drawings prepared in 1951 were stamped "As-built" but were not stamped in the revision block. Real Property Accountable Record/1190 indicates that Building 1190 was completed c1952 as a Change House for unconventional fuels personnel. W. C. Kruger Company (Santa Fe, NM) provided the construction drawings stored in CE File #1190. The builder is not known. A comparison of the current building and original blueprints reveals that no structural modifications to the building have occurred.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1190; CE File 1195-1 (c1951).

Current Function: Security Police operations.

Original Function: Change House, Unconventional Fuels.

Interim Functions: "RC Con House" (n.d.); "Prpln R-L Fuel/Lub" (n.d.); Prop Res Lab Rocket" (n.d.); "Prpln R-L Rkt" (n.d.); Sp Operations (n.d.).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1190-1 (c1951).

Foundation: Poured concrete footings and grade beams; concrete slab.

Exterior walls: Concrete masonry units (CMU).

Roof: (Built-up) gravel on rigid insul.; 2" slab sup. by metal lath and steel joists.

Notable interior features, including machinery: Shower stalls, locker room, dressing room, and laboratories.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

202

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Recommend reassessment of Building 1190 once the fifty-year construction date is met in the year 2002. This building retains historic integrity.

VII. ASSOCIATED BUILDINGS:

According to CE File #1190-1 *Title Sheet*, Unconventional Fuels Storage Building 1190 was associated with Building 1194 (Booster Inspection), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

This building retains all aspects of historic integrity. Although not meeting the "exceptional importance" standard imposed on buildings constructed within the last fifty years, Building 1190 remains potentially eligible as an individual property once the fifty-year date of construction is met in the year 2002. Recommend inclusion in a Multiple Property nomination along with the other unconventional fuels storage buildings. Building 1190 is currently being used as a storage and administrative facility by the 49th Squadron Security Police personnel. The original shower stalls, dressing room, locker room, shop, tools and supply rooms are all used for storage. Free-standing shelves have been installed to accommodate storage. As a result, some original doors and windows are blocked from view. Minor alterations have occurred at the interior. Two partitions have been removed. Glazed tile walls appear to have been added to at least one office. Vinyl tile has been installed over one section of the concrete slab in what once served as a machine shop. Some of the window panes have been painted. Because this facility remains potentially eligible, recommend that the original design features be considered in future modifications, and that photographs document any changes to the essential features. Suggested routine maintenance: Prune trees away from principal facade. Noticeable water damage warrants inspection of the roof. Replace broken window panes. Repair hole at exterior south elevation wall.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: Interior room layout as a Change House remains a key design element. This layout includes large open interior spaces, smaller labs/offices, and showers, dressing, and locker rooms used by unconventional fuels personnel.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Although no longer used as such, Building 1190 continues to be situated in the vicinity of other buildings historically associated with unconventional fuels testing and storage. This building appears to been recently landscaped.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two interior partitions removed. Glazed tile walls in office rather than CMU shown on original drawings.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Nearly all original workmanship remains visible, particularly at exterior.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Aside from the change in operations occurring here, Building 1190 remains essentially as it was originally constructed.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

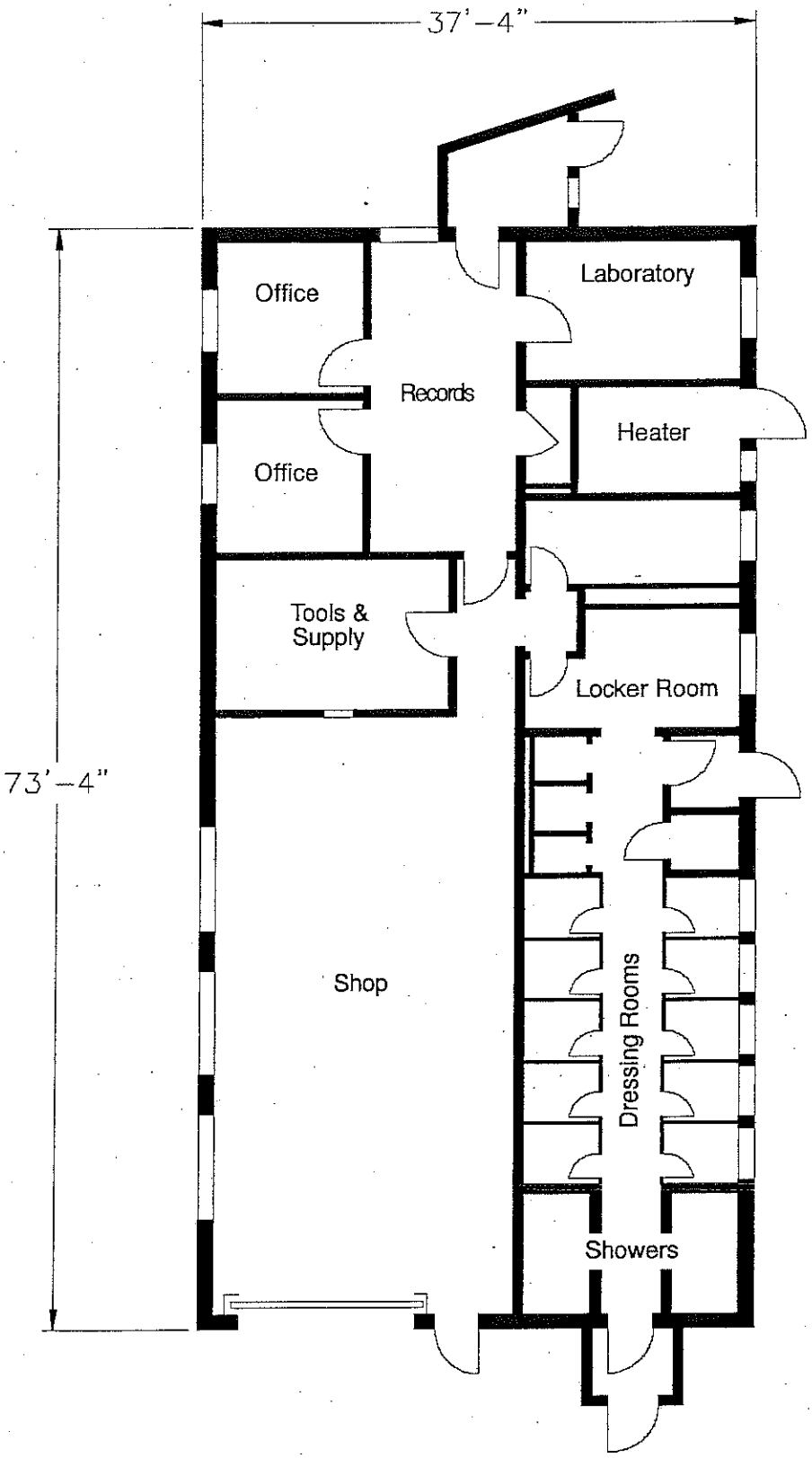
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #-Photo #**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1190-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1190** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Mike Gardner* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1194

Specifications and history are given in the "Cold War Survey".
Facilities in this building consist of:

- Toilet
- Lavatory

An on site inspection was done on 7 Jan 08 with the current facility manager, SSgt Joshua Roberts. In the inspection it was noted that the bathroom is separated from the work area drain. There was no history known. The building is currently being used for storage and it has been used for storage and has been used for storage for the past ten years.
Attachment 55d shows where the leach field for Bldg.1194 was located in 1984.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME: **Building Number:**

Current: Research Equipment Storage.

Historic: Booster Inspection/Unconventional Fuel.

Street Address: 1584 Lethal Rd., HAFB, 88330-7840. **1194**

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1194 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

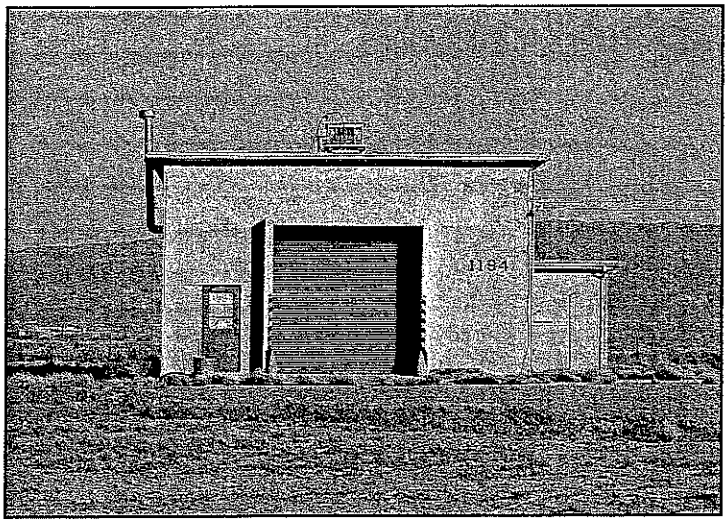
Comments: Interior partitioning is reversible.

Preliminary Determination of National or State Register Eligibility:

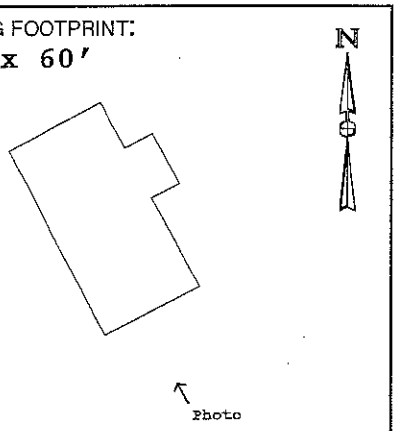
[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.



BUILDING FOOTPRINT:
30' x 60'



Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1194 is a rectangular, single-story, high bay structure made of concrete masonry units (CMU) and exhibiting a flat roof. The principal elevation faces west, showing one large roll-up door, and one personnel door. One row of windows is located below the eave line at the north and south elevations. The ceiling at the interior is exposed. "As-built" construction drawings show that Building 1194 was completed in 1952. W. C. Kruger Co. (Santa Fe, NM) provided the architectural work (1952: CE File 1194). The builder is unknown. No structural modifications to the original structure were noted.

III. HISTORIC AND CURRENT USE:

Current Function: Research equipment storage.

Original Function: Missile Assembly Test Building/Booster Inspection.

Interim Functions: "Mls/Space Rsch Tst" (n.d.); "M/Assembly Test Bldg" (n.d.); "Shp Wpn and Rlse Sys" (c1976); "BE Stor Cv Fclty" (n.d.); "Rsch Equip Stor" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1195-1 (c1952).

Foundation: Poured concrete footings and stem wall. Slab on compacted fill.

Exterior walls: CMU between concrete columns and bond beams.

Roof: BUR gravel. Rigid insulation. 2" concrete deck supported by steel joists.

Notable interior features, including machinery:

4-ton Wright Company chain-operated crane and hoist system, hoist no. 5197, serial no. 4925. The hoist is attached to a runway "I"-beam (crane) supported by steel support beams. Large metal roll-up doors at east and west elevations.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

210

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1194, although not meeting the "exceptional importance" standard, may be eligible for the National Register for its role in early Cold War materiel development once the fifty-year construction date is met in 2002.

VII. ASSOCIATED BUILDINGS:

According to CE File #1195-1 (c1951) *Title Sheet*, Building 1194 was associated with Building 1190 (Change House), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1194 remains essentially as it was constructed c1952. The original floor plan layout included one main room and an equipment room. A small area in the northwest corner of the main room has been partitioned. No documentation was found pertaining to this modification. This minor partitioning of the main room is reversible. This building is no longer associated with either missile assembly and test activities or unconventional fuels storage, and currently serves as an equipment storage room for the 6585th Test Group. Construction drawings (1956: CE File # 1194-1) show that an addition to this building was planned. There is no indication that this addition was ever built. Because this building retains historic integrity, and may be eligible for the National Register under Criteria A and/or C once the 50-year construction date is reached in the year 2002, recommend that future modifications take essential design features into account. Note: One isolated occurrence of prehistoric artifacts was noted on the grounds north of the building, including one white chert core, and one secondary chert flake.

Suggested routine maintenance: Scrape, prime, and paint the exterior. Replace downspouts. Prune landscape plantings away from foundation.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Construction drawings show plans for an addition to the north elevation (1956: CE File #1194-1). There is no evidence that this addition was ever built.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The high open-bay floor plan allowing the crane and hoist system, and the large metal equipment roll-up doors remain as key design elements.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Buildings 1193 and 1194 remain in an unmodified and isolated setting.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Nearly all of the historic materials used to construct this building remain visible.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two doors have been replaced. All windows appear to be original. Interior partitions at the northwest corner divide the original floor plan.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Although retaining its original open floor plan, this building is currently used for storage of modern equipment.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

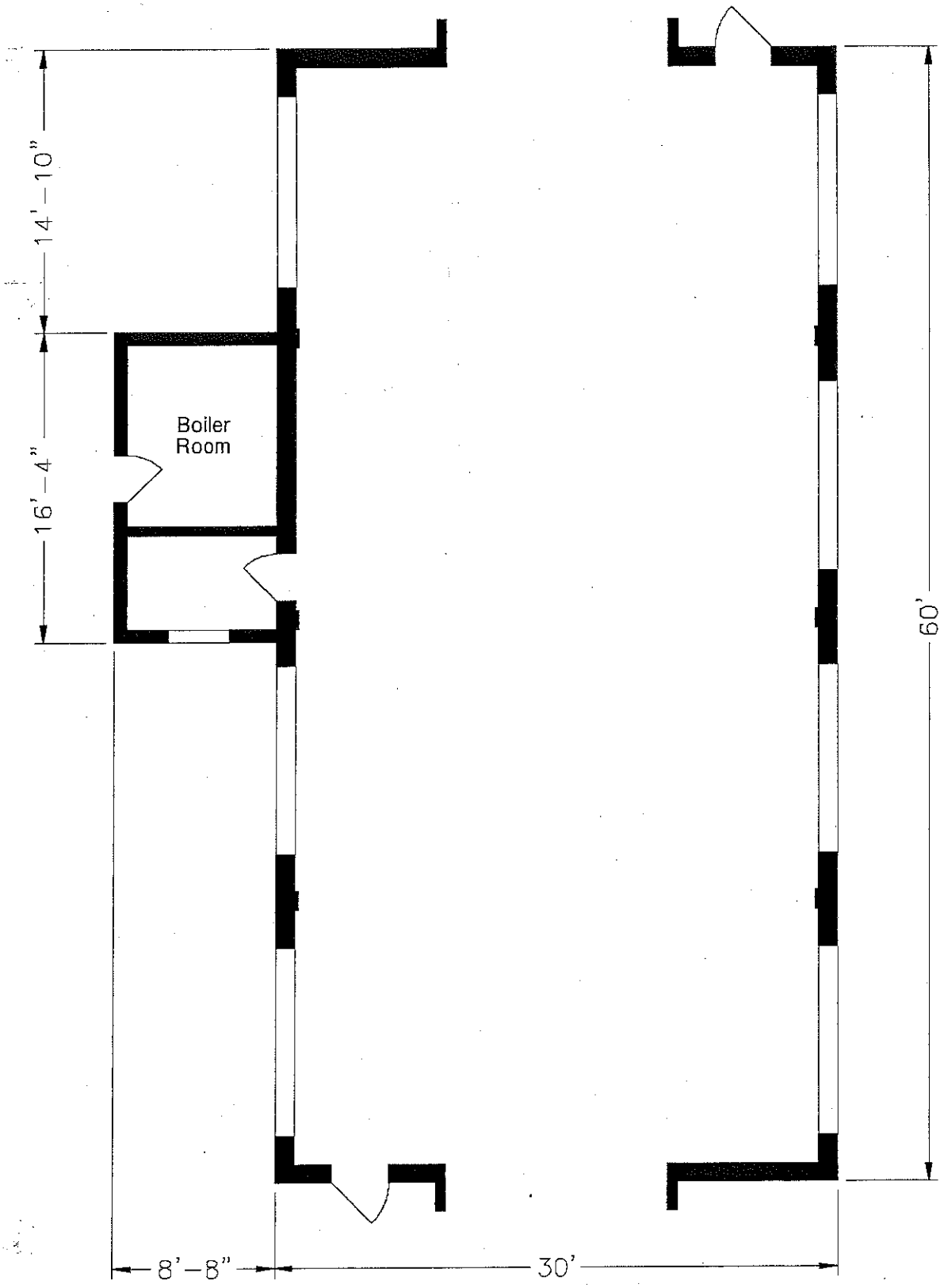
Comments: The open floor plan, isolated setting, hoist system, and nearby continuity check stand (Building 1193) contribute to this building's integrity of association.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #3-Photo #31**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1195-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1194** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1196

This building was constructed in 1956. It originally built for missile assembly, but is now in communications equipment storage.
The original facilities consisted of:

- Toilet
- Lavatory

These facilities were replaced in 1975 with:

- Toilet
- Urinal
- Lavatory

An on site inspection for this building was done on 4 Dec 07 with the current facility manager Sgt Lander. The information gathered from this inspection was that there were not any floor drains located within the building. In the past it was used for TAC can and for the past ten years it has been used for storage.
Attachment 55d shows where the leach field for Bldg. 1196 was located in 1984.

Figure 6: Picture of Bldg. 1196

INACTIVE SEPTIC SYSTEMS

BUILDING 1199

This building was constructed in 1957. It was originally built as a rocket fuel laboratory. In 1987 it was converted to the Security Forces Kennel.
As the fuels laboratory, it contained:

- Toilet
- Urinal
- Lavatory
- Shower

After conversion to the kennel, the facilities were changed to:

- Toilet
- Urinal
- Stainless Steel Sink

During the investigation stage of the project there were drawings found for building 1199. Attachment 12 and 13 are of the Site Plan, the Sewer Isometric, the Plumbing Plan and the Floor Plan.

Along with the drawings that were found an on site inspection was completed on 29 Nov 07 with the current facility manager, SSgt Gilmore. A new Security Forces Kennel area has been built and now the building is currently being used to house animals until they can be transferred to Alamogordo Animal Control.

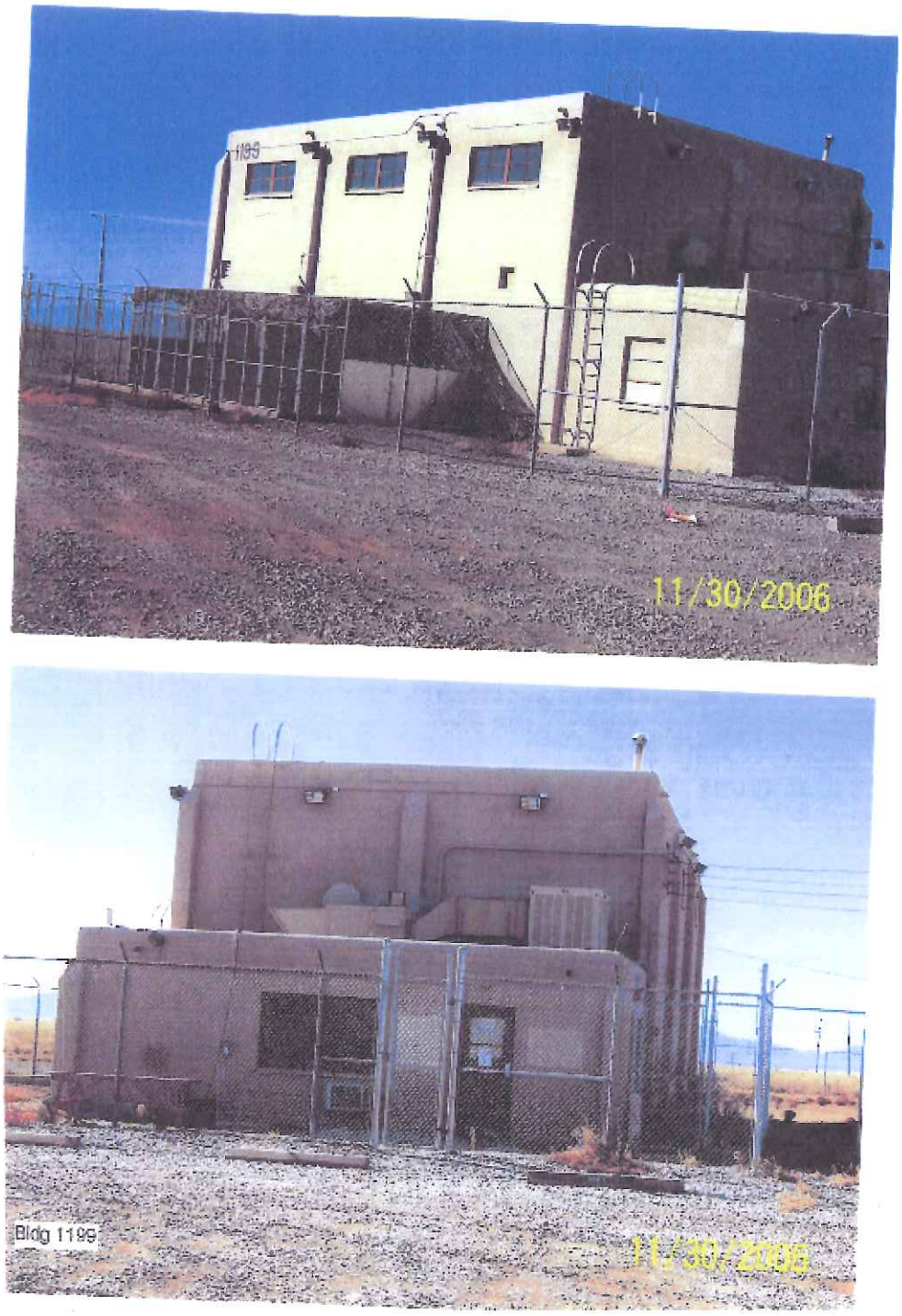


Figure 7: Pictures of Bldg 1199

INACTIVE SEPTIC SYSTEMS

BUILDING 1200

Specifications and History: See "Cold War Survey".

Three drawings were found for this building. These drawings show the Plumbing Floor Plan (Attachment 14), a Floor Plan (Attachment 15) and the Septic Tank and Drain Field (Attachment 16).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab, Medical (VACANT).
Historic: Space Biology Laboratory.
Street Address: 841 Douglas Road, HAFB, 88330-7823.

Building Number: 1200

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [ ] Needs maintenance [x] Deteriorated [ ] Archaeological

Comments: Building 1200 is abandoned, and showing signs of deterioration.

Degree of Alteration: [ ] None [ ] Minor [x] Moderate [ ] Major

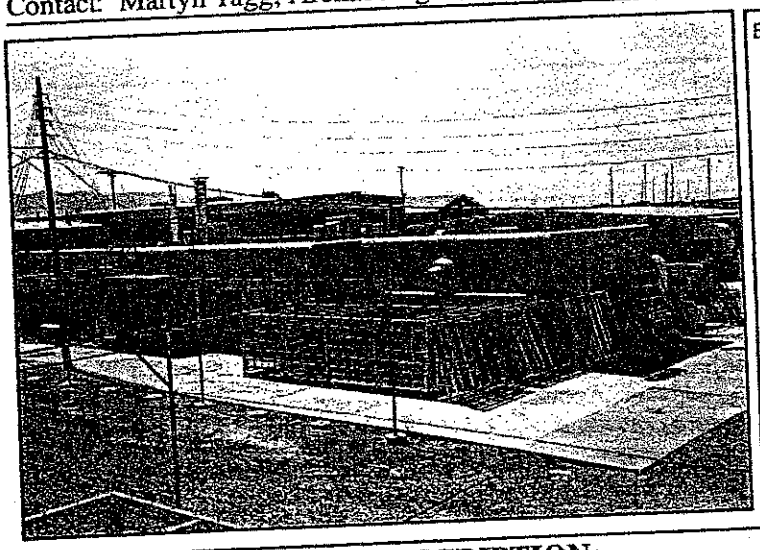
Comments: Alterations are architectural rather than structural.

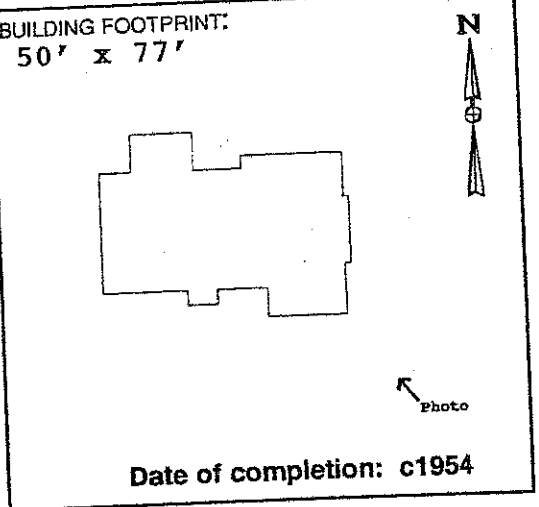
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1200 no longer retains historic integrity. See Section VI.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1954

273

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1200 is a rectangular, single-story, flat-roofed concrete masonry unit (CMU) building constructed as one of several laboratories dedicated to important aeromedical research using both animals and humans. None of the construction drawings were correctly stamped "As-built." According to Real Property Accountable Record/1200, the estimated date of construction is 1954. Subsequent improvements documented in CE File drawer #1200 include an addition to the medical lab (c1958), a covered passageway added to the boiler room (c1957), and a frame wall addition to the surgery room (c1957). Neither the builder nor the architect is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1200; Field visit Summer 1995.

Current Function: Vacant.

Original Function: Space Biology laboratory/Animal experimentation.

Interim Functions: Animal experimentation/Storage.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1200-1 (c1953).

Foundation: Concrete wall footings. Concrete slab on fill.

Exterior walls: Painted concrete masonry units (CMU).

Roof: BUR on concrete deck, supported by metal lathe and steel bar joists.

Notable interior features, including machinery:

Originally used as a medical laboratory, with work tables, work benches, built-in lockers, cabinets, operating tables, x-ray tables, etc.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:

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One room is currently being used for storage. All medical and laboratory equipment has been removed.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Due to extensive alterations to the exterior, Building 1200 no longer retains historic integrity. Recommend, however, that this building be considered as a contributing feature in a basewide early Cold War National Register of Historic Places Multiple Property nomination.

VII. ASSOCIATED BUILDINGS:

Building 1200 was an integral part of Holloman's aeromedical facilities, including Buildings 1201, 1202, 1203, 1204, 1205, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Since its original construction c1954, Building 1200 has been used as a laboratory and medical facility for a wide variety of research animals, including trout, black bear, dogs, mice, and chimpanzees. Although currently abandoned, this building featured a lead-lined x-ray room, an autopsy room, an observation room, a surgery room, a dark room, and animal pens (c1954: CE File #1200-1). Built-in steel lockers, metal cages, x-ray tables, work benches, food bins, operating tables, scrub sinks, surgical lamps, sterilizers, etc. have been removed. Two exterior doors have been blocked in, and thirteen exterior windows have been blocked in. One exterior door and one exterior window have been added. Interior walls have been added, removed, or relocated. A storage room has been added to the south elevation. Animal cages remain at the west elevation. The presence of dead rodents, foul odors, torn pipe and duct insulation (possible containing asbestos) and peeling paint (possible lead-based) represent hazards to health and safety. Because of the unique and important nature of the research conducted here, recommend that this building be nominated as a contributing feature as part of an HAFB early Cold War National Register Multiple Property nomination.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?
[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.
Comments: The building has been located at its present location since c1954.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?
[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact
Comments: Most of the original doors and windows have been removed. All of the equipment has been removed. Most of the original finishes have been obscured.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting
To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting
Comments: Continues to be situated in an isolated setting with the other Aeromedical facilities.

Materials: To what extent have the original materials used to construct this structure been retained?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Elevations have changed due to modified openings, an addition, and a covered passageway. Interior wainscot and cornice removed, wall tile added.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Exterior walls and cages remain intact. Some architectural features remain. Most of the original interior workmanship has been lost.

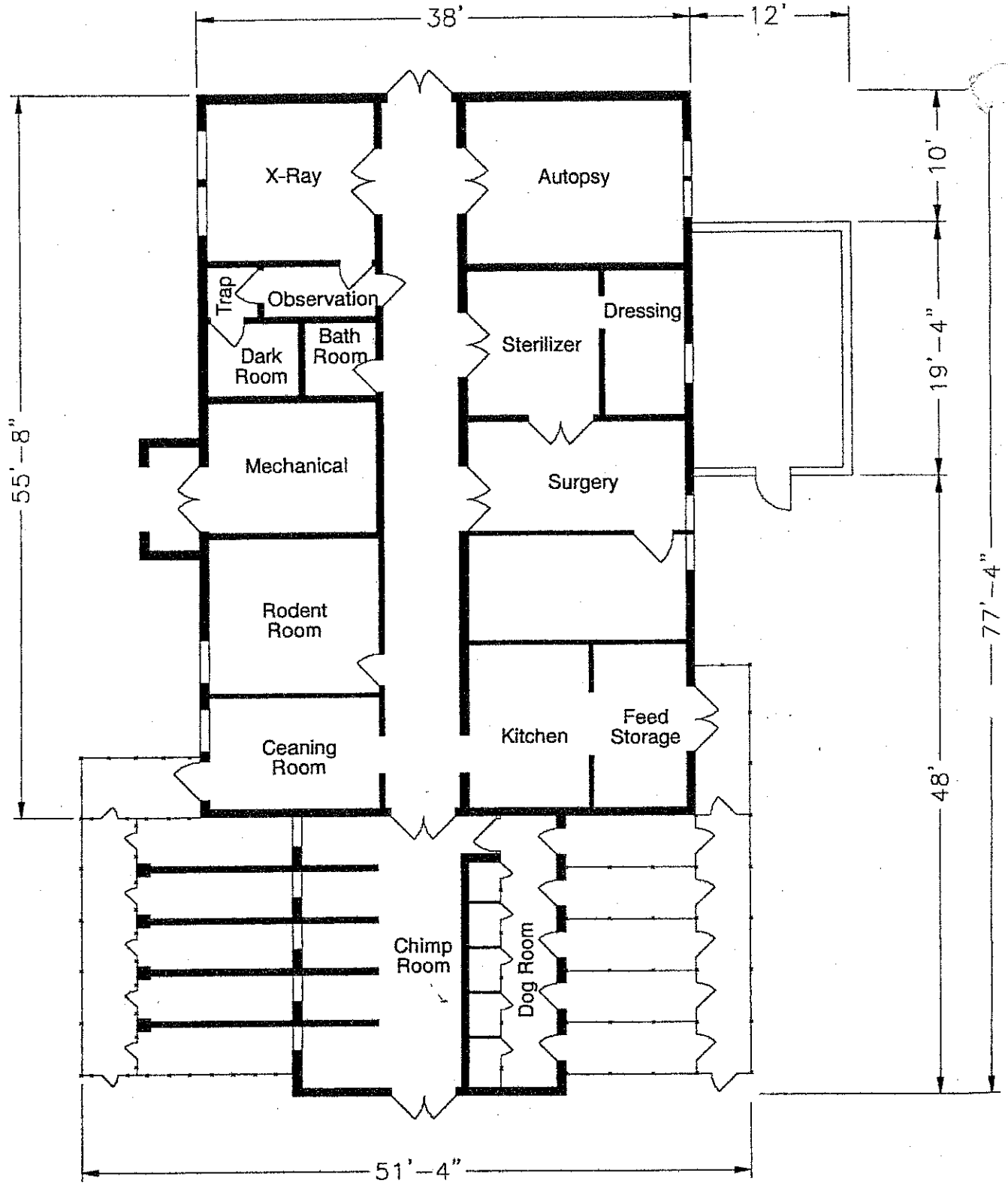
Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?
[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity
Comments: Building 1200 continues to be situated within the compound set aside for animal research. Chimpanzee research continues today in nearby buildings.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?
[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity
Comments: Although all of the equipment has been removed, this building still demonstrates a link with its past by virtue of its setting, the odors, and the animal cages.

X. FURTHER INFORMATION:

Surveyed By:
Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #94**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1200-1 (c1954)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1200** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

BUILDING 1201

Specifications and History: See "Cold War Survey"

Seven drawings were found for this building. These drawings show the Septic Tank and Absorbent Area Layout, Isometric Sewer Layout, Septic Tank Plan and Septic Tank Elevation (Attachment 17), Floor Plan (Attachment 18), Layout Plan (Attachment 19) and Systematic-Waste System (Attachment 20).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab Medical.
Historic: Aero. Medical Field Lab.
Street Address: 821 Douglas Road, HAFB, 88330-7823.

Building Number: 1201

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Structurally intact. In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

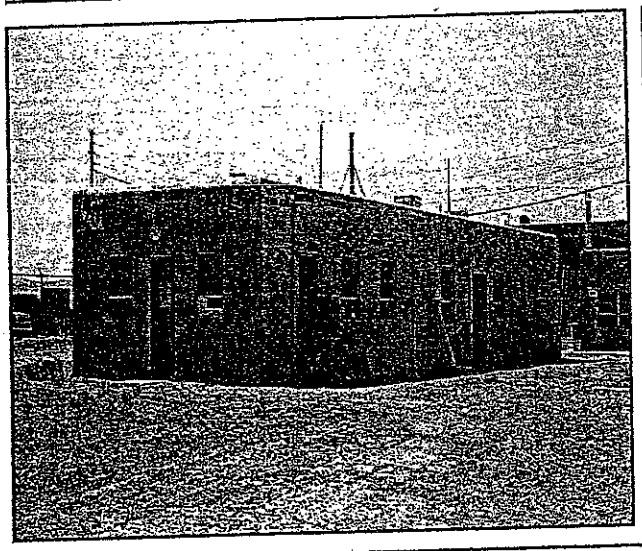
Comments: Mortuary/autopsy room added as subsequent improvement c1958.

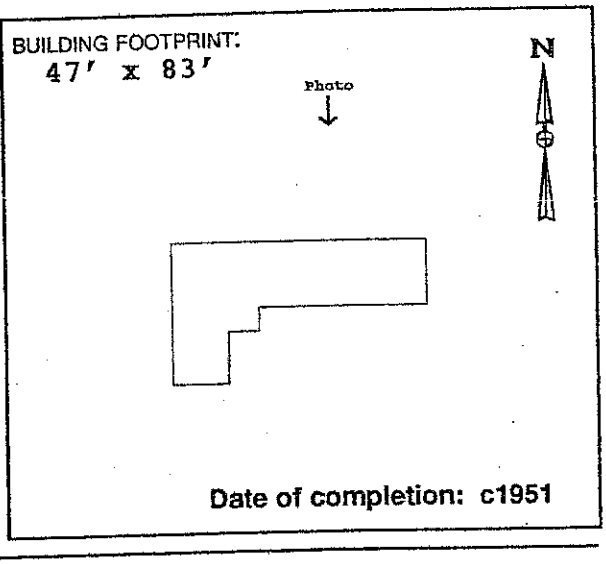
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible under Criteria A and/or C at a national level.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1951

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1201 is an "L-shaped", single-story, flat-roofed, building constructed primarily using painted 8" structural clay tile and exhibiting asymmetrical door and window placement. Animal cages occupy the west elevation. Real Property Accountable Record/1201 indicates that this science laboratory was constructed c1951. The construction drawings consulted were stamped "As-Built," although no date was given. Both the architect and builder are unknown.

At least two structural modifications may be viewed as subsequent improvements to the original building, including the addition of a Mortuary/ Autopsy Room (c1958: CE File #1201-4), and the addition of a rooftop observation deck (c1952: CE File #1201-5).

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1201.

Current Function: Carpentry shop; Employee break room; Office space.

Original Function: Aerospace Medical Lab; Animal experimentation.

Interim Functions: "SC Lab Human Eng" (n.d.); "SC Lab Med (c1968).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1201-1 (c1951).

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted structural clay tile.

Roof: Built-up roof w/ gravel on sheeting, supported by 2x12 wood joists.

Notable interior features, including machinery:

Fixed chain link cages, lab tables, equipment tables, work tables, wood storage bins, sterilizer, incubator.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL: (Based on field visit Summer 1995

[c1958 SUBSEQUENT IMPROVEMENT--MORTUARY/AUTOPSY]:

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted cement masonry unit (CMU).

Roof: 5-Ply built up roof on concrete slab. Steel joists.

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Notable interior features, including machinery:

Washer and dryer, kitchenette, tool room, table saw, furniture, lockers.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1201 is eligible to the National Register under Criteria A and/or C at a national level of significance for its vital role in early aeromedical research in support of the early Cold War space exploration mission.

VII. ASSOCIATED BUILDINGS:

Building 1201 was associated with the other Aeromedical facilities, including Buildings 1200, 1202, 1203, 1204, 1205, 1206, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1201 retains historic integrity as far as the structure itself goes. Very little physical evidence remains of this structure's original use as an animal laboratory. The cages have been removed. Two interior walls with doors have been added. One interior wall has been removed. Service sinks, work tables, wooden bins, an incubator, and other lab support items shown on c1951 construction drawings have been removed. An area of the original roof approx. 10' x 13' was reinforced with three inches of concrete for observation deck c1952 (CE File #1201-5). A mortuary/autopsy room was added c1958. These additions may be viewed as early improvements, and do not diminish Building 1201's historic integrity. Drawings itemize a "2-body" mortuary room, an autopsy table, a band saw, cabinets, a sterilizer, a photography area, and other laboratory equipment. This equipment has been removed. This room currently serves as a lounge area for employees. Due to the important research conducted here in support of this nation's space program, further research is warranted. Recommend that Building 1201 be included in a Cold War-era Multiple Property nomination. Suggested routine maintenance: This building is showing the signs of long-term neglect. Fill the stress cracks at the exterior corners. Scrape and paint exterior walls. Replace window glass and door hardware as needed.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Continues to be situated in an isolated compound.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Original structure essentially intact. Interior lab equipment and cages removed.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Enclosed by chain link fence topped with barbed wire, along with other research facilities. Chimpanzee research continues in nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Clay tile walls still intact. Some glass block windows remain. Some glass block windows blocked in when addition constructed. Floor tiles removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Roof, walls, and exterior openings remain essentially the same. The east elevation changed due to an early addition. Interior partitions, openings, and finishes have changed.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Historic photographs show that the natural, historic, and aesthetic character of Building 1201 has been retained.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

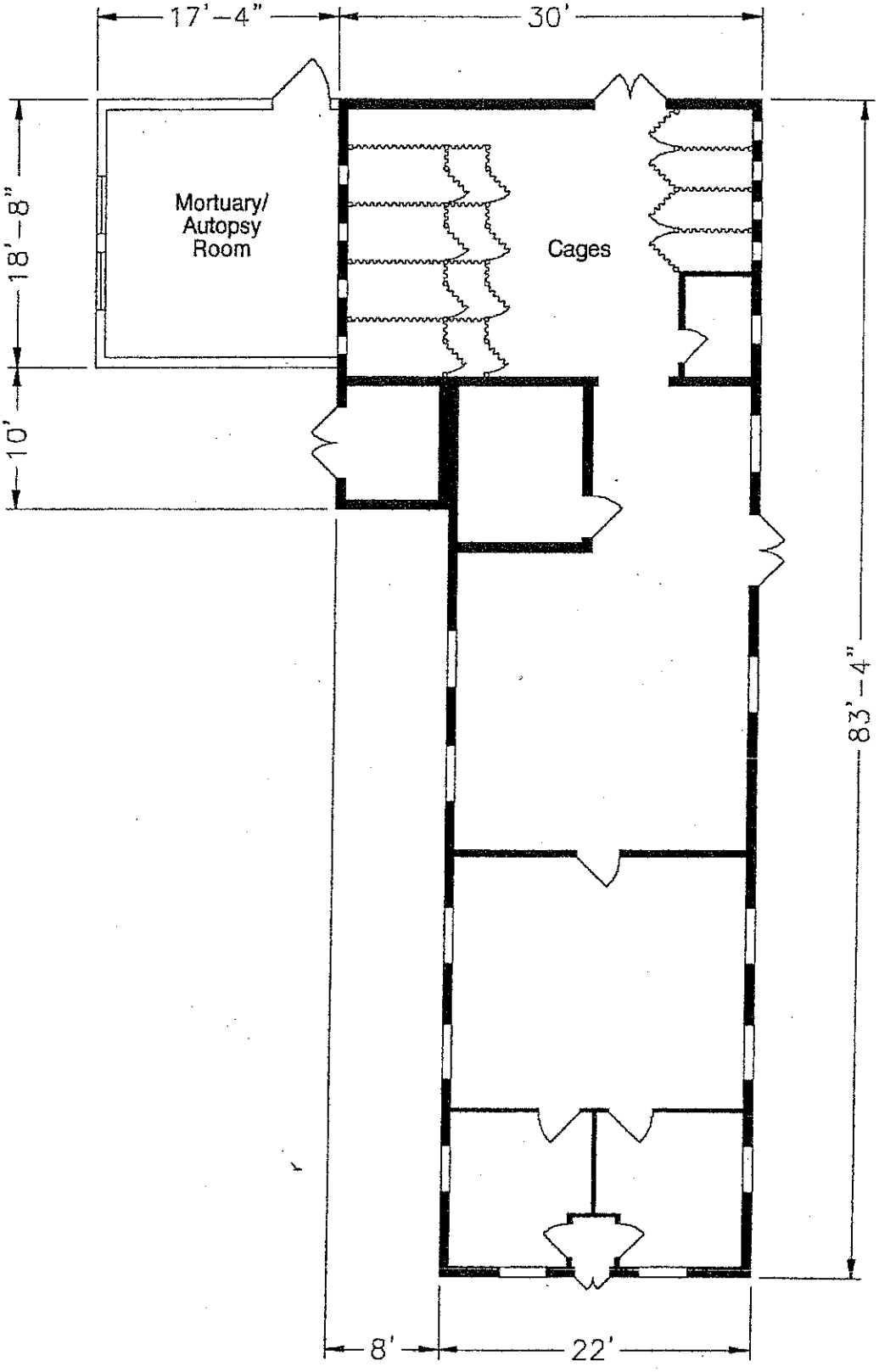
Comments: Building 1201 retains a visible link with its period of significance.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #91**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1995**



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Source: CE File #1201-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1201** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

Buildings 1219, 1221, 1235 and 1239
An on site inspection was completed on 20 Dec 07 with the current facilities manager, TSgt Pote, he has been the facilities manager for the past nine years. During the inspection it was discovered that there are sink holes on all leach fields in the compound. All buildings in this compound have separate drains for the bathrooms. All buildings are also currently connect to the base sewer system.
Attachment 55d shows the leach field location for Buildings 1219, 1221, 1235 and 1239.

BUILDING 1219

This building is the Administrative Offices for the Munitions Maintenance Squadron. It was constructed in 1985 and covers 4476 SF.
There are Men's and Women's Bathrooms that discharged into two (2) septic tanks prior to the installation of a sewer main that discharges to the Base Waste Water Treatment Plant.

INACTIVE SEPTIC SYSTEMS

Building 1221

This building is in the Ammo Depot and was originally constructed for ammunition storage. It was later switched to store inert munitions.
The building was constructed in 1983 and covers 2857 SF.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan (Attachment 21), Floor Plan (Attachment 22), Partial Plan (Attachment 23), Septic Tank Details and Sewage Disposal System (Attachment 24) and a Profile of Sewer Line Septic Tank and Disposal Field (Attachment 25).

INACTIVE SEPTIC SYSTEMS

BUILDING 1226

This is a munitions maintenance shop building constructed in 1985. It has 2945 SF of floor space.
Facilities installed include:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Utilities Plan (Attachment 26), Plumbing Demolition Plan (Attachment 27), Plumbing and HVAC Plan (Attachment 28) and Waster/Water Piping Detail (Attachment 29).

In Figure 8 on the following page it can clearly be seen where the leach field is in relation to where building 1226. This is the leach field for building 1219, 1221, 1235 and 1239 as well. In Attachment 46 (a map showing many of the building on Holloman AFB) it can be seen where building 1226 is in relation to these building.

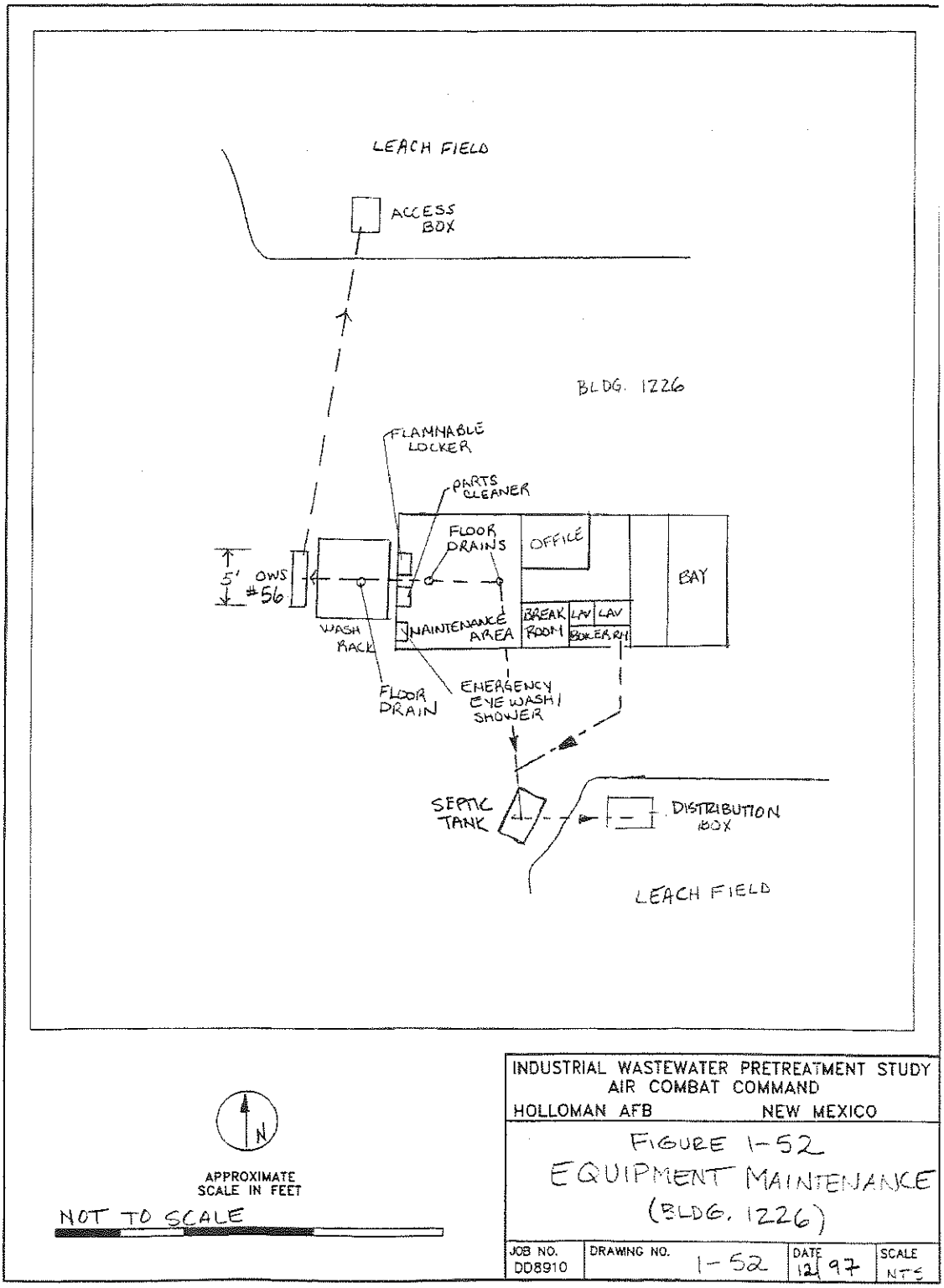

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Figure 8: Drawing of Leach field

INACTIVE SEPTIC SYSTEMS

BUILDING 1235

This building was constructed in 1964 and contains 3000 SF of floor space.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, a drawing for this building was also located. This drawing (Attachment 30) shows the Site Plan, Septic Tank Details and Sewer Clean Out.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST

INACTIVE SEPTIC SYSTEMS

BUILDING 1239

This is another building in the Ammo Depot. It was constructed in 1971 and contains 1920 SF.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Urinal
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan, Septic Tank Details, Utility Plan (Attachment 31), Floor Plan (Attachment 32), Grading Plan (Attachment 33) and Lavatory Detail (Attachment 34).

INACTIVE SEPTIC SYSTEMS

BUILDING 1250

This building was constructed in 1957 and contains 2890 SF.
It was originally a water pumping station. In 1985 it was changed into a storage facility. As part of the change in service the bathroom facilities were removed. Currently it has a large infestation of vectors and it is unsafe to go inside. The POC for this building is Mr. Chuck Price.
The original facilities consisted of:

- Toilet
- Lavatory
- Floor drains for the water pumps

INACTIVE SEPTIC SYSTEMS

BUILDING 1251

This building was constructed in 1965 and contains 1300 SF.
In the records it is listed as a Research and Testing Shop. It currently has a large infestation of vectors, therefore it is not safe to go inside. The building has been vacant since the mid 90's. The point of contact for this building is Mrs. Eisele.
It contains the following facilities:

- Toilet
- Lavatory

INACTIVE SEPTIC SYSTEMS

BUILDING 1269

This building was constructed in 1966 and contains 3262 SF.
The original service was a Medical Science Laboratory. It has been relegated to a storage facility.
The facilities consisted of:

- Toilet
- Lavatory
- Kitchen Sink with Garbage Disposal

Site Specific Contingency Plan: See Attachment 1

Max. Spill Quantity (gal): 55

Chemical	Container Type
Benzene	NA
Acetonitrile	

REMOVED SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	1102	1952	6'x4'x8'10"	2500
2	1103	1948	7'x9'x3'2"	1412
3	1108	1958	6'x9'6"x6'3"	750
4	1119			
5	1150	1953	4'x9'x6'3"	2500
6	1154			
7	1166	1960		450
8	1175	1949	5'1"x10'4"x6'10"	2970
9	1176	1959		640
10	1265	1992		1200
11	1173			

REMOVED SEPTIC SYSTEMS

BUILDING 1102

Specifications and History: See "Cold War Survey." More information can be seen in the drawings. The drawings that have been found for this building are as follows the Grading Plan (Attachment 35), Septic Tank Details and Boring Log Results (Attachment 36), Leaching Well and Cover Details and Sewer Clean Out (Attachment 37).

Attachment 55c shows where the leach field was located for this building in 1984.

This building has the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Missile Radar Station.
Historic: Radar Triangulation: King I.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1102

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

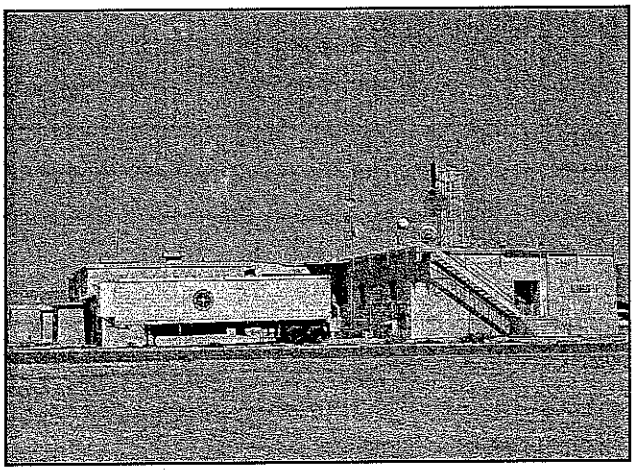
Comments: Essential structural and architectural features remain intact.

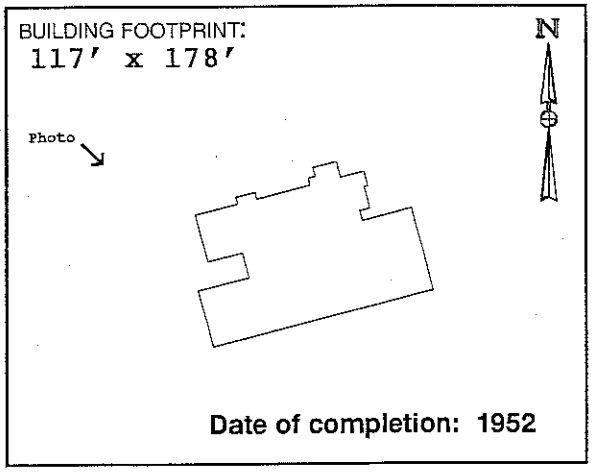
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Recommend listing as part of a Cold War Multiple Property.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1102 is a one-story concrete masonry unit, multi-shaped building with a central corridor running east-west the entire length and single rooms flanking both sides of the corridor. Original footprint shows primarily rectangular shape with a central projecting core. This core is a large open room with an upper balcony around its perimeter. Construction of the original building was completed in 1952, according to "As-built" drawings in CE File #1102-1. Surveillance display room added in 1969 (CE File #1102-1). It is unclear when north elevation additions constructed, although information in Real Property Accountable Record/1102 date the additions as being post-1970. The architect for this project was W. C. Kruger (Santa Fe, NM). The builder is unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1102.

Current Function: Telemetry and Optics. Altitude measurements.

Original Function: Missile Instrumentation Station; Mission Control.

Interim Functions: Missile Radar Station.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1102-1 (c1952).

Foundation: Concrete footing and foundation wall. Column spread footing.

Exterior walls: Concrete masonry units (CMU).

Roof: Bituminous concrete over built-up roof, ltweight concrete, supported by one-way concrete slab using concrete beams and steel beams encased in concrete.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

380

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Eligible under Criteria A and/or C at a national level of significance for important role in early Cold War-era missile and High Speed Test Track mission control and tracking. Further research recommended.

VII. ASSOCIATED BUILDINGS:

Building 1102 supported all missions at White Sands Missile Range and at Holloman Air Force Base until Building 300 and possibly 1527 at White Sands were constructed.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1102 continues to operate as a mission control building, with mostly optics and telemetry functions. The Flight and Instrument Control Room, and the Surveillance Radar rooms are vacant. Originally, missiles were fired using an analog boards (mechanical) system. When operations changed to a digital system in c1978, support moved from the central instrument control room to the north addition off of this room. Nearly all of the original interior finishes remain unchanged.

Suggested routine maintenance: Scrape, prime, and paint all block and concrete surfaces. Remove vegetation and rusted pipes by gas meter. Fill depressions at foundation, and regrade using gravel to promote positive drainage. Fill holes at concrete stoops. Replace wood bumper at dock using similar-sized lumber. Secure panel covers on abandoned electrical panels. Enclose live connections in junction boxes. Scrape, prime, and paint metal stairs. Reattach stair nose treads. Remove miscellaneous debris from building perimeter.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Still situated at the northeast corner of the intersection of Tula Peak Road, and Douglas Road.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The original floor plan remains intact.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Continues to be situated at the intersection of two roads in an isolated setting with few nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Most all original materials have been retained at both the exterior and the interior.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: All original exterior and interior room finishes remain visible. At the south elevation, one window is blocked, one window has been replaced with a door, and the door at the loading dock has been replaced. Most of the north elevation is obscured by the addition of an operations room.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1102 continues to support limited mission control operations.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

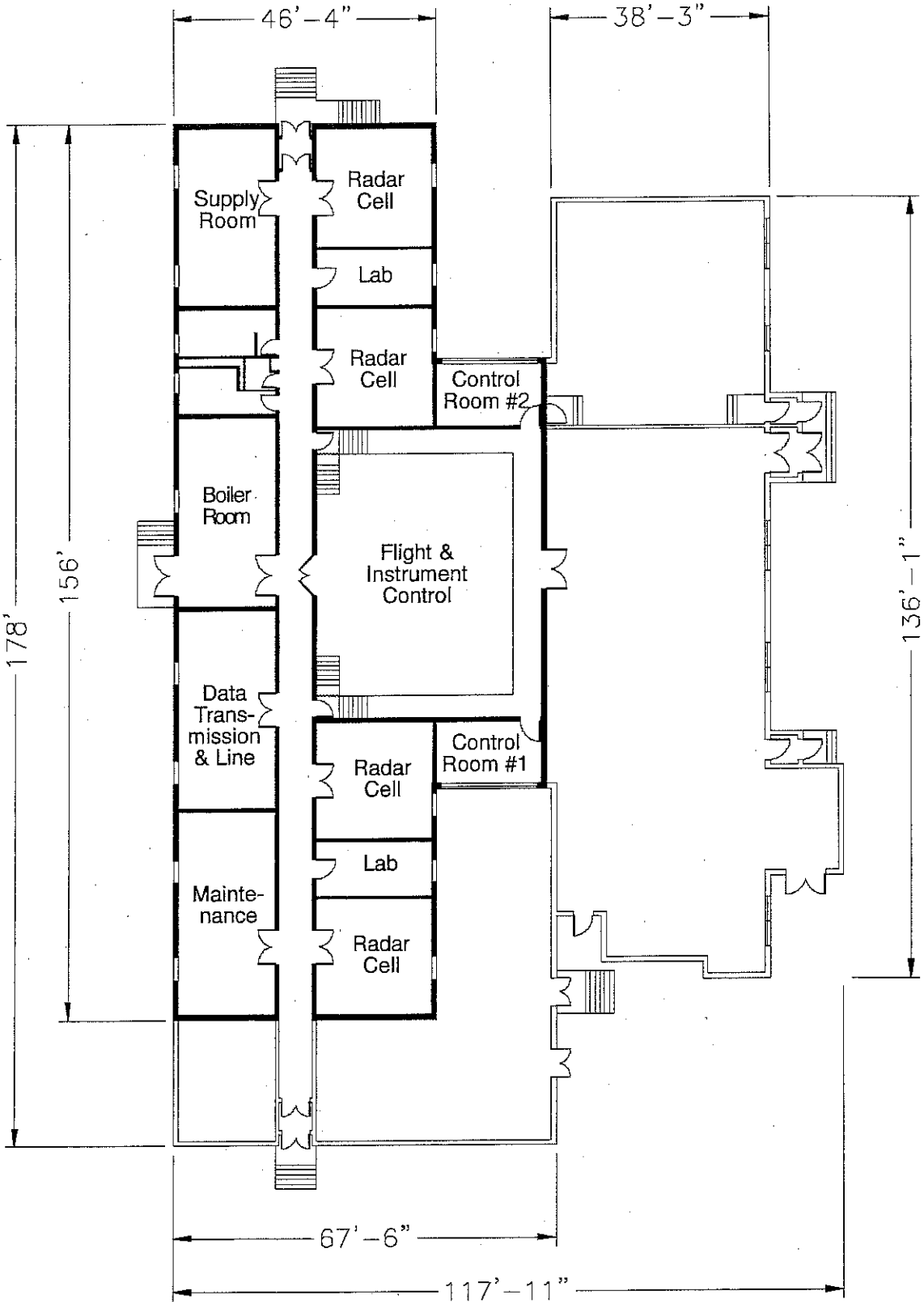
Comments: Building 1102 retains an evident link with its aesthetic and functional historic character.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #49**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1102-1 (c1952)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1102** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-6401* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1103

Specifications and History: See "Cold War Survey" the Layout Plan (Attachment 38) has also been provided.

Attachment 55c shows where the leach field was located for this building in 1984.

Facilities: This building contains the following facilities.

- Tiolets-2
- Urinals-2
- Lavatories-3
- Service Sinks-3

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Timing.
Historic: Telemetering Building.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1103

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance only.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

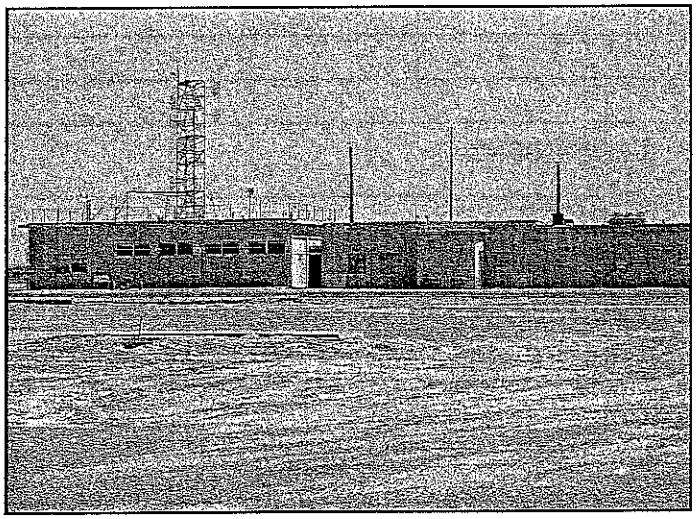
Comments: Few alterations since early improvements.

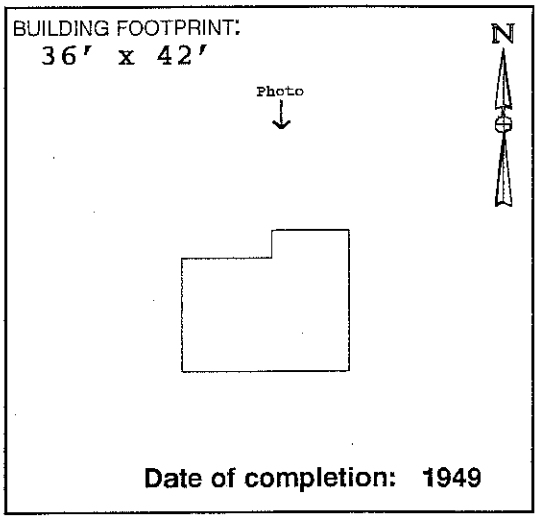
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Research recommended to determine historic use. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1103 is a one-story rectangular building with concrete masonry unit walls, and a flat roof. The original building was completed in 1949, according to "As-built" drawings located in CE File #1103-1. This original construction is centrally located, flanked to the east and west by subsequent additions. Real Property Accountable Record/1103 documents the addition of 2,930 square feet to the original building with the notation "Subsequent Improvements thru May 57." One or both additions to the original building may therefore be considered to be subsequent improvements, rather than additions that compromise historic integrity. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE: (Personal communication with Building 1103 personnel)

Current Function: (East end) Leased by WSMR to transmit mission timings.

Current Function: (West end) Unknown.

Original Function: Telemetering station for data collection of Range missions.

Interim Functions: Real Property Accountable Record/1103: "Communications CTR" (c1962); "Telecom Cen" (c1971); "Comm Fclty" (c1980); "Elec Rsch Rdr" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1103-2 (1967); CE File #1103-1 (1949).

Foundation: Concrete wall footing.

Exterior walls: Painted concrete masonry units (CMU).

Roof: Built-up roof on wood sheathing and 2 x 8 wood joists.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Although perhaps not meeting the "exceptional importance" stipulation imposed on buildings constructed within the last fifty years, Building 1103 may be eligbile for the National Register under Criterion A at a regional or national level in the year 1999. If further research determines that Building 1103 is not eligible as an individual property, consideration should be given to its eligibility as a contributing feature in a Cold War Multiple Property submission for its support of early Cold War-era test launches.

VII. ASSOCIATED BUILDINGS:

Building 1103 was associated during its historic period of significance with Building 1102, mobile data collection vans, and Building 300 at White Sands Missile Range.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1103 appears very different today from depictions on "As-built" drawings dated 1949. It is unclear whether additions to the east and west ends of the original building represent early improvements to the original building, or whether these additions represent later construction that has compromised the historic integrity of the original building. Information obtained from Real Property Record/1103 and field visits seems to indicate that the additions represent early improvements to the original building. If so, Building 1103 retains historic integrity. Further research is needed to verify the construction sequence, and to verify what early Cold War-era research activities were supported by Building 1103. Currently, Building 1103 is leased by the White Sands Missile Range. Aside from minor partitioning at the telemetering room, the original floor plan of the original building shows no alterations. Wood posts (6 x 6) that appear on original drawings to support the roof girders have been removed.

Suggested routine maintenance: Repair, or replace in kind, the exterior wood architectural features, including the soffit, fascia, wood doors, and louvers. Patch spalling concrete at foundation. Remove vegetation at roof.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Original telemetering room is now used as spare equipment storage.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Earlier location plans indicate three utility buildings situated in a row next to Building 1103 to the east. These buildings have been removed. Continues to be set in a somewhat isolated setting, in the vicinity of King-I.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Unable to access some rooms. Those rooms that were accessed, however, appear to have most of the original materials intact. A brick chimney and a metal stack have been removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original windows at north elevation have been covered up at the interior. The telemetering room has been partitioned (reversible).

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity

Comments: Building 1103 personnel are actively engaged in serving as a timing link for White Sands Missile Range tests.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

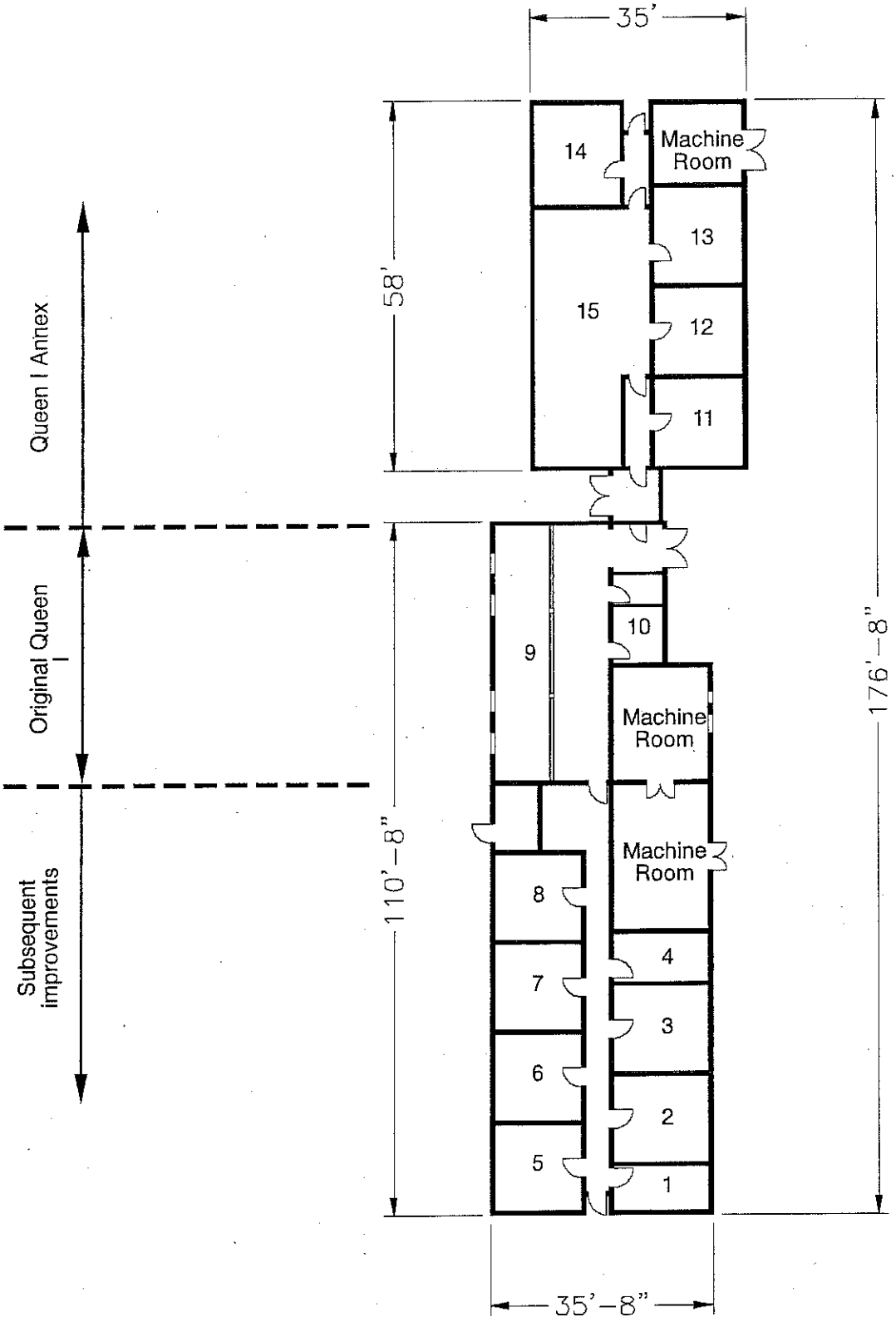
Comments: Building 1103 continues to provide support to the White Sands Missile Range.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #47**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: Dynalectron *Facilities Handbook*, c1964.

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1103** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1108

This building was constructed in 1958 and contains 2626 SF of floor space.
The building was originally built to serve as the telephone exchange. In 1980 it was retitled as a communications facility.
The building contains the following facilities:

- Toilet
- Lavatory
- Janitorial Sink

The drawings provided (Attachment 39-40) show a Utility Plot Plan, Septic Tank Details, Sewer Clean Out, Toilet Room Details and Plan Details.

Attachment 55e shows where the leach field was located for this building in 1984.

Site Specific Contingency Plan: See Attachment 1 and 2

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate into local area on ground

Tank location: North of facility

Fuel Flow - North

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST
MOGAS	250 gal each/ 2 /AST

REMOVED SEPTIC SYSTEMS

BUILDING 1119

This is an Army owned building that contains 2224 SF of floor space. Use and maintenance of the building was transferred to the Air Force in 2005. Prior to the Air Force taking possession the Army had delegated the building to the GSA for use as a vehicle maintenance shop. Once the Air Force took over, the building changed service to an electrical shop and storage facility.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
Diesel	250 gal ea/ 3 /AST
MOGAS	250 gal ea/ 2 /AST
Diesel	750 gal ea/ 3 /AST

Figure 9: Picture of Bldg 1119

REMOVED SEPTIC SYSTEMS

BUILDING 1150

This is also an Army owned building and therefore details are lacking from Holloman's records. The building has 2844 SF.
The original service is unknown, but since the Air Force started using the building it has been used as storage space.
It contains the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 9: Drawing of Bldg 1150

REMOVED SEPTIC SYSTEMS

BUILDING 1154

This is an Army owned building and there is no information in Holloman's files pertaining to this building.

Attachment 55c shows where the leach field was located for this building in 1984.

REMOVED SEPTIC SYSTEMS

BUILDING 1166

This building was constructed in 1960 and contains 4955 SF. The structure is a Test Track Shop/Storage Building known as the "Break Setter Building".
The facilities include:

- Toilets-2
- Urinal
- Lavatory
- Shower

Attachment 41 is a drawing showing the sewer layout and the septic tank details.

Attachment 55c shows where the leach field was located for this building in 1984.

Site Specific Contingency Action: See Attachment 3

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate in local area on ground; if full tank or drum spilled' the substance may reach open ditch.

Material Compatibility: No material incompatibilities

Chemical	Container Type
Oil/Water Separator Waste	500 gal/ 1 / UST

Figure 10: Picture of Bldg. 1166

REMOVED SEPTIC SYSTEMS

BUILDING 1175

Specifications and History: See "Cold War Survey"
Facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

In Attachments 42-44 a trench pit, the toilet room details, the trench junction to UPS, the sanitary sewer manhole and water and sewer piping can be found for Bldg 1175.

Attachment 55c shows where the leach field was located for this building in 1984.

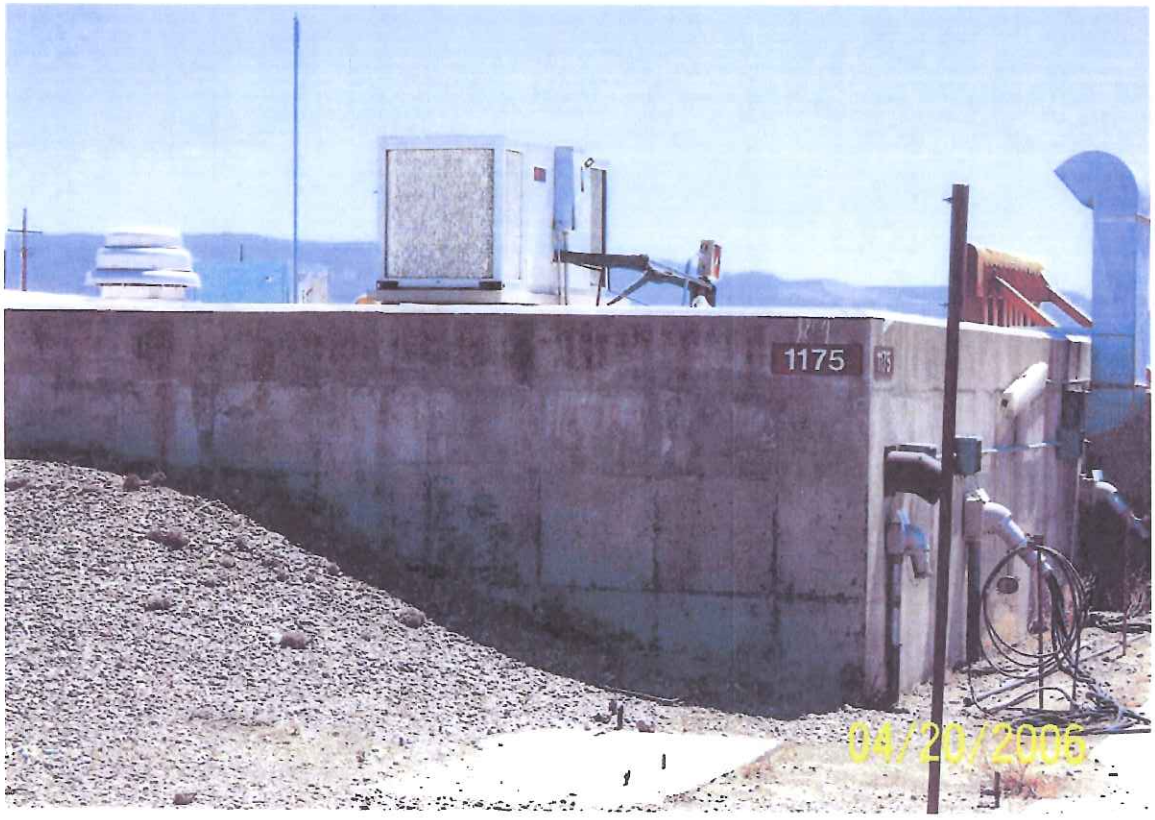


Figure 11: Picture of Bldg 1175

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Blockhouse--"Alpha".
Historic: Blockhouse--"Alpha".
Street Address: 1656 Test Track Rd., HAFB, 88330-7848.

Building Number: 1175

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1175 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

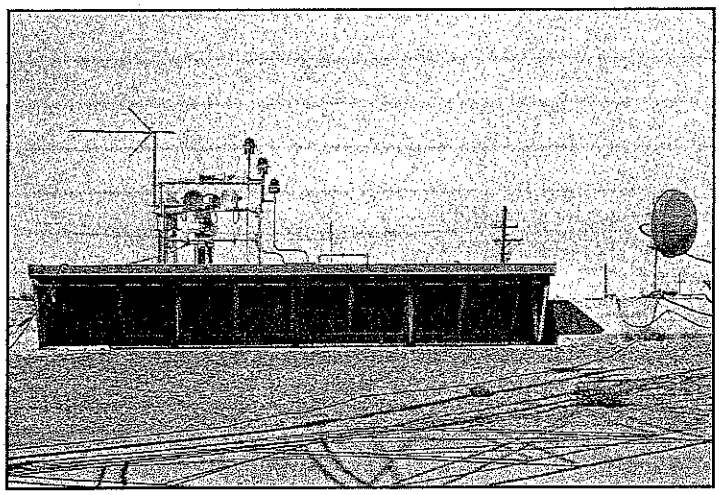
Comments: Modernization at interior to enable continued Test Track use.

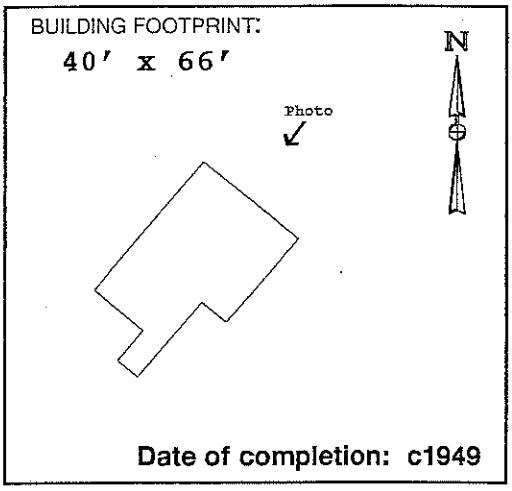
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible for the National Register under Criteria A and/or C.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1175 is an irregularly shaped, one-story concrete structure, built mostly below grade. The building is accessed by a ramp leading down to double doors at the southwest elevation. These doors access the original launch control room constructed in c1949. This entrance, three entrances off of the ramp, and windows facing the track (northeast) are the only visible openings. A 15′ x 32′-6″ addition was constructed at the northwest elevation in 1960 (CE File #1175-2). Another addition, adjacent to northwest side of ramp was completed in 1981 (CE File #1175-3). The ramp extension was also constructed at this time. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1175; CE File #1175-1 (c1949).

Current Function: Launch control facility, High Speed Test Track.

Original Function: Launch control facility, High Speed Test Track.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1175-1 (c1949); CE File #1175 (c1980).

Foundation: Concrete footings.

Exterior walls: Reinforced concrete.

Roof: 3-foot thick reinforced concrete.

Notable interior features, including machinery:
A long row of thick blast-proof windows faces the track to the northeast.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

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VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

"Alpha" Block house Building 1175 is one of the original High Speed Test Track support facilities, constructed c1949 to provide launch control. Recommend that Building 1175 be nominated under Criteria A and C as part of a basewide early Cold War Multiple Property listing.

VII. ASSOCIATED BUILDINGS:

Building 1175 operated, and continues to operate, in support of the high speed test track launching activities, along with Buildings 1162, 1163, 1161, 1645, and the Horizontal Test Stand facility (Buildings 1159 and 1160).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1175 retains historic integrity. Due to its national level of significance under Criteria A and C, recommend that Building 1175 be listed along with the other test track support buildings as part of a Multiple Property nomination to the National Register of Historic Places.

Subsequent improvements to the original Building 1175 augmented the original design and function as a launch control facility for important research conducted at the high speed test track. The interior was renovated in 1984 (CE File #1175-4). Although this renovation obscures original interior finishes, Building 1175 as a whole retains historic integrity of location, design, setting, workmanship, materials, feeling, and association. Of interest to future researchers may be the dramatic changes in computer technology which have occurred since the construction of Alpha Blockhouse: Computers which at that time required several rooms to house, now occupy considerably less space. Launch control operations continue at Alpha Blockhouse, although rooms designed to hold early equipment are virtually empty.

Suggested routine maintenance: Repair bond beam where steel is exposed. Remove vegetation at exterior embankments. Remove debris at front walkway.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Subsequent improvements to the original floor plan added to Building 1175's design and function as a launch control facility.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Except for the construction of smaller buildings in the vicinity, the original setting of Building 1175 near the test track launch pad has been retained.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: The raised wood floor in the console room has been removed. The original light fixtures have been removed. One wood and glass partition has been removed. Sheetrock® walls, carpeting, wainscot, and linoleum have been added to the control room.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original workmanship at the northeast elevation, and at the entrances at the ramp is still visible. Interior renovations hide the original architectural craftsmanship.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1175 continues to function as a launch control facility for the High Speed Test Track.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

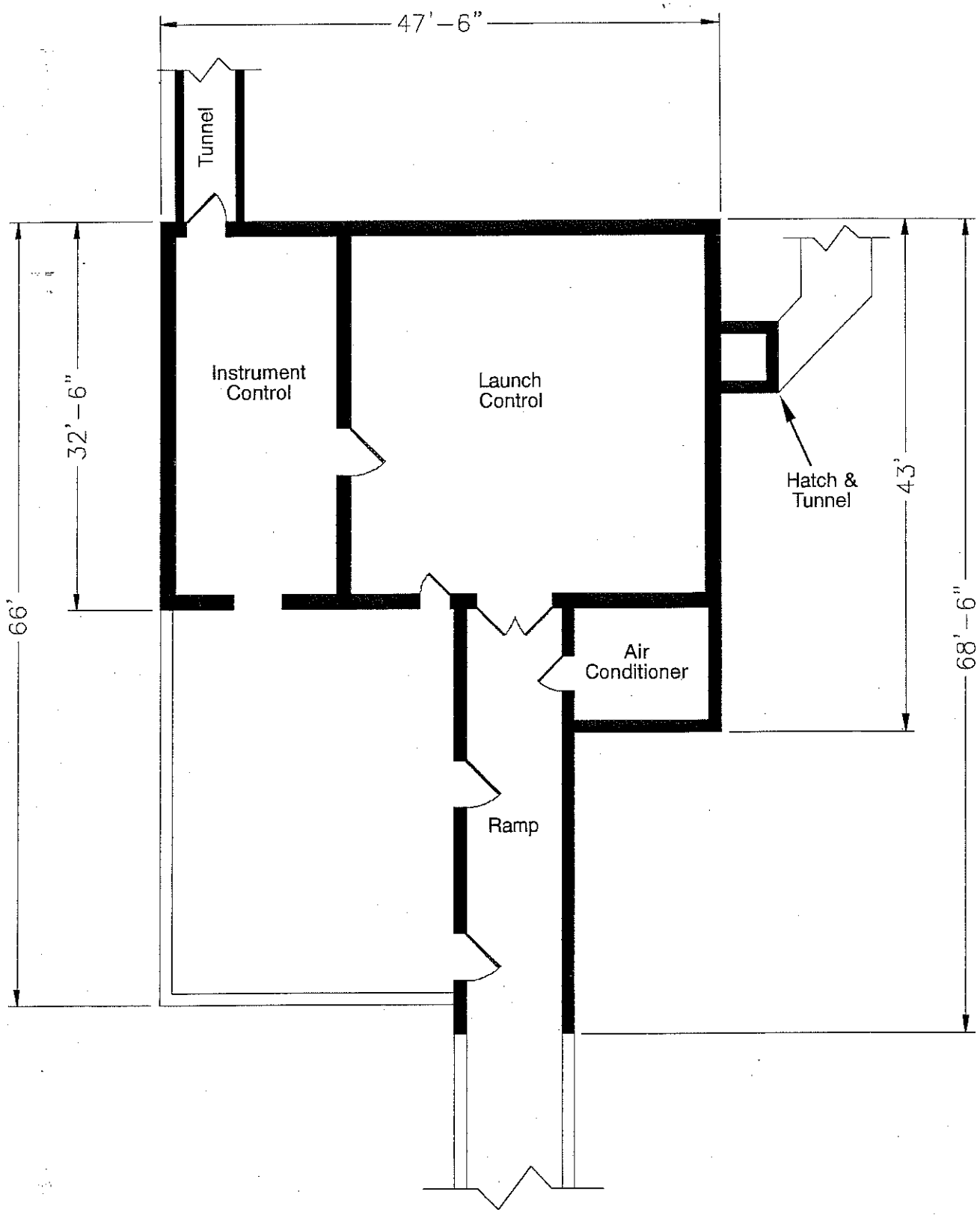
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #35**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1175 (c1980)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1175** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1176

This building was constructed in 1959 and contains 3850 SF.
The building is located at the Test Track and is known as the Sled Launch Shop.
Facilities include:

- Toilet
- Lavatory
- Shower

In Attachments 45-48 a plumbing plan, new drain pit, utility plan, sewer clean out, utilities contour plan and septic tank details can be found for Bldg 1176.

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 12: Picture of Bldg 1176

REMOVED SEPTIC SYSTEMS

BUILDING 1173

This building was constructed in 1957 and contains 17,428 SF.
The building is the main office building at the Test Track.
It contains the following facilities:

- Toilets-8
- Urinals-4
- Lavatories-9
- Janitorial Sinks-2

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 13: Picture of Bldg 1173

REMOVED SEPTIC SYSTEMS

BUILDING 1265

This building was constructed in 1957 and covers 43,388 SF.
This is the Inertial Guidance Facility, previously known as the Guided Weapons Lab.
The building contains the following facilities:

- Toilets-12
- Urinals-6
- Lavatories-12
- Janitorial Sinks-5

This building has been attached to the sewer system at Holloman AFB since before 1984.

In Attachments 49-53 a Water Piping Diagram, Partial Plumbing Plan, Floor Plan, Building, Pavement and Utilities Layout, Sewer Clean Out, and Enlarged Plan can be found for Bldg 1265.

North Wind

Letter No. NW-2008-155

Mr. Dave Griffin
Project Manager
49 CES/CEV
550 Tabosa Ave.
Holloman AFB, NM 88330-8458

11 March 2008

SUBJECT: Technical Memorandum summarizing the decommissioning of inactive septic tanks at HAFB in January of 2008

Dear Mr. Griffin:

Reference Contract Number: W9128F-04-D-0017 DO-0017

Attached please find a copy of the above referenced Technical Memorandum and attached State of New Mexico On-Site Liquid Waste System Abandonment forms. Also attached are copies of the daily reports for the field work.

Please contact me (phone 785-838-3141 or email at tmatzen@northwind-inc.com) or the Program Manager, Rusty Gilbert (phone 210-722-4074 or email at rgilbert@northwind-inc.com) if you have any questions.

Sincerely,

Thomas A. Matzen, P.G.
Project Manager
North Wind, Inc.

Attachments: Technical Memorandum summarizing decommissioning work conducted on inactive septic tanks at HAFB

cc: R. Gilbert (North Wind)
Mr. Tom Zink (USACE Omaha District)
Letter File

North Wind

Technical Memorandum

11 March 2008

To: Mr. David Griffin, Holloman AFB
CC: Mr. Tom Zink, USACE Omaha

From: Tom Matzen, North Wind, Inc

SUBJECT: Decommissioning of Abandoned Septic Tanks Conducted 8 - 24 January 2008 at Holloman AFB

Purpose

This memorandum summarizes the septic tank decommissioning activities conducted on abandoned STLFs from 8 through 24 January 2008 at Holloman AFB.

Description of Work

North Wind, Inc. (NWI) contracted a local septic system installer (Jontel Septic) to decommission 21 abandoned Septic Tanks at Holloman AFB. During the course of the decommission work NWI was requested also to abandon a septic tank at Building 1284 for a total of 22 tanks. North Wind provided a field supervisor to obtain excavation permits, coordinate field activities, and to ensure that quality and safety requirements were met.

Base dig permits were obtained for each of the systems prior to conducting any excavation work necessary to locate the systems. After dig permits were obtained, each system was excavated (if required) to the extent necessary to remove the top of each tank, crush or otherwise perforate the bottom of each tank such that water will not pool in the abandoned tank, and backfill each tank with clean fill per State of New Mexico requirements. Each system was pumped out (if it contained any liquid or sludge), and visually inspected prior to decommissioning.

The required system abandonment forms for each septic tank with accompanying photographs are in Attachment 1. Attachment 2 contains the Daily Progress Report/Quality Control Report Forms. Please note that these forms start at number 29. Forms 1 through 28 were used for daily reporting on the Septic Tank and Leach Field Inspection work.

Interpretation of Findings:

Several tanks were still active and so were not decommissioned. These include the tanks at Buildings 308 (actually an oil/water separator), 1097, 1219, 1226, 1235, and 1239. No septic tanks could be located at Buildings 1200, 1201, and 1269 though we did backfill an earthen pit at Building 1200 and an abandoned sewage treatment plant at Building 1201. Mr. Shawn Quarles, the Base safety person, marked Building 1190 off of the 332 form. Mr. Quarles stated that Building 1190 had been demolished and that there was nothing left at that location. The location of the septic tank at Building 1284 was such that it could not be accessed for demolition. The septic tank at Building 1091 was not abandoned at this time as NWI was unable to obtain a security escort. The tank at Building 1091 will be abandoned while NWI is working on the active septic tank upgrades.

As the abandonment forms indicate, the majority of the septic systems on the original list provided by HAFB were decommissioned per state requirements.

Table 1 summarizes the decommissioning activities and status of the listed septic systems.

Summary of Results

Table 1. Summary of septic system decommissioning activities for abandoned STLFs at HAFB.

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
1	308	01/24/08	Found an oil/water separator still in use.	Notified Base POC that this is an oil/water separator.
2	920	01/16/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
3	921	01/16/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
4	922	01/17/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
5	924	01/17/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
6	1091	01/24/08	Building is in security area. Could not obtain escort.	No action taken at this time. Will decommission tank when we are in the area doing tank replacement work.
7	1097	01/23/08	Found that the septic tank for this building is also hooked into Bldg 1099 and is still in use. Inspected system. This septic tank has no manholes, bottom is damaged and is leaking, no baffle present, leach field is dry and full of dirt.	Turned system back over to active list and inspected system. Inspection form is attached.
8	1190	01/14/08	During the course of obtaining a dig permit for this Bldg the safety person, Mr. Shawn Quarles, marked this one off of the 332 form. Mr. Quarles stated that this Bldg had been demolished and that nothing was left at that location.	Notified Base POC of situation regarding Bldg 1190

North Wind

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
9	1194	01/09/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
10	1196	01/08/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
11	1199	01/09/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
12	1200	01/11/08	No septic tank located. Did locate abandoned earthen pit with a concrete cover. Notified Base POC of situation and received instructions to backfill and abandon.	Removed concrete cover over pit and backfilled pit with clean fill.
13	1201	01/11/08	No septic tank located. Did locate an old abandoned treatment plant. Notified Base POC of situation and received instructions to decommission and backfill the old treatment plant.	Demolished old treatment plant by crushing bottom and caving in sides, then backfilled with clean soil.
14	1219	01/18/08	Septic tank still in use	Notified Base POC that system is still in use
15	1221	01/18/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
16	1226	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.
17	1235	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.
18	1239	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.

North Wind

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
19	1250	01/23/08	Located abandoned septic tank. Also found an old diesel tank still containing fuel.	Opened septic tank, pumped out, crushed bottom, and backfilled tank. Notified Mr. Gomolak at CE Environmental regarding diesel UST.
20	1251	01/23/08	Located abandoned septic tank	Opened tank, pumped out, crushed bottom, and backfilled tank.
21	1269	01/16/08	Could not locate any septic tank. Mr. Vernon (a 30+ year employee) stated that the building had been on the base sewer system for the last 30 years and that the septic tank may have been removed when the moat around the building was removed.	Notified Base POC that there does not seem to be a septic tank at this building.
22	1284 (not on original list, added at request of HAFB POC)	01/16/08	Septic tank hangs over back side of area and is not accessible for removal. This tank is a holding tank with a manual valve that drains to a ditch below. There is no water in the associated Bldg.	Notified Base POC. No action taken.

Future Work

As discussed above in Table 1 the septic tank at building 1091 still must be decommissioned. There are septic systems in that area that require repair and 1091 will be decommissioned when the other septic tanks are being repaired.

North Wind

Attachment 1
Septic Tank Abandonment Forms

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
ON-SITE LIQUID WASTE SYSTEM ABANDONMENT

NMED Permit No.: N/A

System Owner's Name: US ACE

Address: HAFB Building # 924

BUILDING SEWER:

_____ Connected to Sewer Lines or Plugged/Capped based on UPC Requirements

ON-SITE LIQUID WASTE SYSTEM TYPE:

- [x] Septic Tank
- [ ] Seepage Pit
- [ ] Sec./Tert. Treatment Unit
- [ ] Other:
- [ ] Holding Tank
- [ ] Cesspool

ABANDONMENT PROCEDURE:

- [x] System Pumped
- [x] Bottom of System Opened or Ruptured or Unit Collapsed
- [x] System filled with Earth, Sand, Gravel, Concrete, or Other Approved Material
- [x] Top Cover Removed or Collapsed
- [x] System Filled to the Top of Sidewalls or above the Level of any Outlet Pipe
- [x] System Filled Level with Top of Ground Surface

COMMENTS/VIOLATIONS:

Elevation 4037 GPS: N32.83401
W 106.12568

ABANDONMENT PERFORMED BY:

Company Name: Foster Septic Co.

Address: PO Box 927 Tijeras NM 87337

NMED ACTION TAKEN:

- [ ] Abandonment Approved
- [ ] Abandonment Approved w/conditions (See Comments/Violations)
- [ ] Abandonment Not Approved (See Comments/Violations)

FINAL APPROVAL:

- [ ] Granted
- [ ] Not Granted

_____
NMED Inspector Date

OK - If Abandoned and meets Requirements	N/C - Not Compliant
N/I - Not Inspected	N/V - Not Verified
N/A - Not Applicable	

#924

#424

424

Appendix B
Photographic Log

Appendix B
Photographic Log
Building 924 (OT-C532)

Photograph No.	Task and Description
1	Building 924
2	Septic Tank Location – Building 924
3	Leach Field Area – Building 924
4	Void Area – Building 924
5	Leach Field – Building 924
6	Geophysical Survey Markings – Building 924
7	View toward Septic Tank and Leach Field – Building 924
8	Influent Line to Septic Tank from Building 924
9	Top of Influent Line Exposed – Building 924
10	Septic Tank Location – Building 924

Photograph 1: Building 924

Photograph 2: Septic Tank Location – Building 924

Photograph 3: Leach Field Area – Building 924

Photograph 4: Void Area – Building 924

Photograph 5: Leach Field – Building 924

Photograph 6: Geophysical Survey Markings – Building 924

Photograph 7: View toward Septic Tank and Leach Field – Building 924

Photograph 8: Influent Line to Septic Tank from Building 924

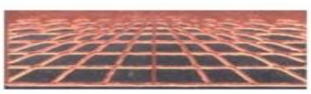
Photograph 9: Top of Influent Line Exposed – Building 924

Photograph 10: Septic Tank Location – Building 924

Appendix C
Geophysical Report

ULS SERVICES CORPORATION

GEOMARKOUT LOCATING Co a tradename



SAN DIEGO–LA . SF- SAC . SEATTLE . ALASKA . HAWAII- GUAM

1 (800) 528 – 8206 www.geomarkout.com 1 (866) 804 – 5734

---------- *A Veteran Owned Small Business* ----------

5 July 2012

Christopher Long, P.G.
Scientist
Federal Services
Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, TX 77077

Subject: Field Documentation Report for Geophysical Services -
Location of Utilities and Underground Features Associated
With Former UST and Septic System Sites,
Holloman AFB, NEW MEXICO (SHAW PO 783916-000 OP)

Gentlemen:

This report documents the recent Geophysical Survey field work ULS Services Corp completed at the subject site On and between the dates of 11 June 2012 thru 23 June 2012.

SHAW / ULS SERVICES CORP
GEOPHYSCIAL SERVICES
FORMER UST AND SEPTIC SYSTEM SITES
5 JULY 2012

SCOPE OF WORK

Scope of this work is includes geophysical services at approximately 29 Former UST or Septic Systems sites located across Holloman AFB that have reportedly undergone past abandonment in place or excavation activities. Geophysical services are employed in an attempt to locate potential USTs, former UST excavation areas, abandoned septic tanks or excavations and associated leach field areas. Location of underground utilities near these observed features is included. Observations are marked out in field and electronically mapped with GPS data collection and GIS presentation. Survey of each site is approximately 25 by 25 to 100 by 100 feet in size.

METHODS

Methods utilized in performance of this work include: Visual Inspection, Analog Real - Time Electromagnetic Induction Conductivity Detection (EMICD), Magnetic Locating (MGL), Ground Penetrating Radar (GPR), and EM Pipe and Cable Location (EMPCL). A sub-meter WAAS GPS receiver with automatic real -time differential correction and ESRI Arcpad software is utilized to collect observation data. ESRI Arc View 10 GIS software is utilized for mapping presentation.

EMIMD ground induction methods are employed to detect both 1) broad metal mass anomalies (Rectangular Surface Projections) or conductive zones that may be indicative of potential USTs – Septic tanks, conductive metal debris, steel reinforced concrete, UST's, building hosts, piping, building demo materials, drums, sumps or other unknown burial materials; and 2) to detect relative lateral changes in conductive zones of soil or backfill materials relative to native soils. Former UST excavations and septic -leachate material may potentially have a higher conductive response or well drained leachate fill materials associated with septic systems may in some cases exhibit a relatively lower or quiet conductive response relative to surrounding higher conductive soil response. A two-way Cartesian grid pattern of five by five feet is walked within the search area (site). Observations are real time and marked on ground surface with paint and pin flagging. Observations are collected with a sub- meter GPS with automatic differential correction and plotted approximately onto web based imagery.

GPR is utilized to detect and potentially observe former UST excavation sidewalls as well as septic – leach field pit sidewall and fill areas. GPR is also utilized to compliment the EM Pipe and Cable utility survey work by potentially locating conductive as well as non-conductive utilities.

A EM Pipe and Cable Survey is conducted at each site by performing ambient passive live power and communication line sweeps, active ground induction sweeps, and active direct- connect or induction- clamp sweeps using existing conducts or pipes visibly nearby. Multiple active frequencies are utilized for best Detection. Utilities are identified where possible and marked unknown if not identified.

All observations are marked with hi-visibility orange-red marking paint. Some Ares are hi-lighted with black paint due to light soil conditions. GPR boundaries indicating potential septic tank and leach field areas are outlined with black paint. Pin flags are also utilized to mark these boundaries in soft soil and weed areas.

OBSERVATIONS

Site Description

The Project Site (Holloman AFB - Former UST and Septic Systems) is comprised of approximately 29 different environmental site locations (heir in referred to as Sites) . Each sites includes and varies in description from existing active building locations to in-active remote abandoned to former building areas where USTs or Septic systems were utilized in the past. Each Site is fairly flat with sandy to gravelly surface conditions. Some sites include native brush and weeds. Sites near active building areas include asphalt or concrete surfaces, sidewalks and planter areas. ULS field staff helped review historical documentation available of each site in the field. Where available, drawings and photographs were reviewed. When available, reported GPS coordinates from reports, of septic tank locations, were utilized by SHAW field staff to navigate to septic tank location to aid focus search area.

Generally there are no surface indications of USTS or Septic tanks, however some limited features exist at some sites and include potential vent riser pipes and asphalt patching, settling areas, and conidial – rectangular cracks in concrete. Surface indications of septic systems at some sites include potential inactive clean- outs pipes near building and nearby existing upgraded sewer man-hole systems that have been connected to the existing Base sewer collection system. Some septic system sites have open holes , surface erosion, and associated potential underground voids observed near the inactive cleanouts and suspected septic search area.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

General ambient or background EM conditions at this site are categorized as being high or noisy most likely resulting from caliche or saline soil conditions throughout the area. These conditions all result in a high ambient background EMICD response that are difficult to filter out, however, subtle to distinct lateral changes are observed potentially marking position of former UST excavations. Magnetic locator is not affected by saline conditions. GPR response in these conditions is poor to somewhat fair, however, subtle, trends in GPR observations exhibit dipping or high angle (from horizontal) refraction bands indicating potential soil side-wall trends allowing for location of approximate former excavations. The use of EMICD and GPR data in conjunction with historical information and physical observations are all utilized to mark the approximate location of potential former USTs in the field as shown on the GIS imagery maps.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

Similar response is observed near former septic systems. Most all septic tanks are reported to have been abandoned in place or partly crushed in place. Magnetic locator surveys revealed concentrated areas of metal response (metal anomalies) likely from metal plates and rebar in septic tanks in areas near former sewer clean-outs and next to reported septic tank locations where latitude and longitude data is available. EM Induction and GPR transects over these metal anomalies further corroborated these findings. EM Induction survey results near the effluent (down gradient) side of metal anomalies (potential septic tanks) resulted in observation of relatively moderately higher lateral response to zones of low to quiet lateral response zones near the septic tanks relative to the ambient response in surrounding area. GPR data across these zones exhibited very subtle side-wall trends that appear to corroborate with EMICD findings. The use of EMICD and GPR data in conjunction with historical information and physical observations of cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs in the field and as shown on the GIS imagery maps.

CONCLUSIONS and LIMITATIONS

The use of EMICD and GPR data in conjunction with historical information and physical observations of reported building location, vent riser location, boiler room location, existing and abandoned sewer cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs , Septic tanks and leach fields. Ambient soil conductivity at this site is very high and EM and GPR data observed is very subtle. Field trends are used to mark the approximate location of potential targets.

As in any type of survey or investigation to determine characteristics below grade, careful exploratory excavation or drilling may be needed to further help determine a more accurate determination of the subsurface. Use of hand tools and air knifing is also useful to help as a safety measure. Base one- call utilities, as well as, private 811 one –call should be consulted and recalled as necessary.

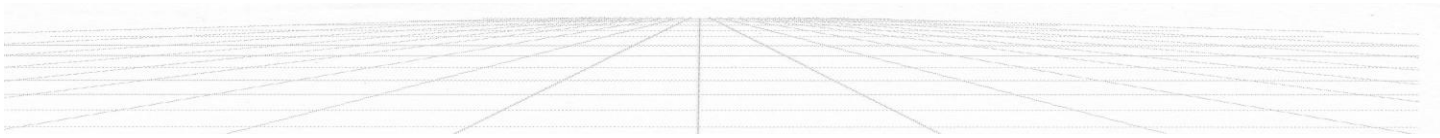
If you have any questions regarding this report please contact me at (206) 384- 2857.

Sincerely,

ULS SERVICES CORPORATION
Geomarkout tradename

Michael W. Benedict
Site Representative

Admin Office/Billing: PO Box 724 Pocatello, Idaho 83204
(208) 234-1441 Fax (208) 234-1507 1 800 301-4420
Seattle / Portland / SAC / Alaska / HWI – AS - GUAM Operations
1 - (866) 804- 5734 / San Diego – LA / Operations 1 - (800) 528-8206



BLDG 924 SEPTIC SYSTEM
HOLLOMAN AFB

WGS_1984_UTM_Zone_13N
ULS SERVICES CORP
mwb 18 June 2012

0 10 20 40 60 80
Feet

Appendix D
Sample Collection Logs

Sample Collection Log

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- Holloman AFB

* STATION 1

Manager Christopher Long

Location Code OTC532 (Bldg 924)

RFA / COC Number 144106-H016

Sample Number OTC532-IS-0001-~~MMDDYY~~ 071612

Task

Sample Name OTC532-z-OTC532-IS-0001-MMDDYY-z

Collection Date 071612

Sampling Method ~~Unknown~~ Hand Auger

Sample Type ~~Unknown~~ Grab

Collection Time 0820

Sample Purpose ~~Unknown~~ Invest.

Start Depth 3'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 5'

Sampling Equip Hand Auger

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase Hins 07/16/12

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

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Manager Christopher Long

* STATION 1

Location Code OTC532 (Bldg 924)

RFA / COC Number 144106 - H016

Sample Number OTC532-IS-0002-M~~MDDYY~~ 071612

Task

Sample Name OTC532-z-OTC532-IS-0002-MMDDYY-z

Collection Date 071612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0835

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 12'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	)(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Logged By / Dat Chase Hill 07/16/12

Reviewed By / Dat

Sample Collection Log

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- Holloman AFB

*STATION 2

Manager Christopher Long

Location Code OTC532 (Bldg 924)

RFA / COC Number 144106 - H016

Sample Number OTC532-IS-0003-~~MMDDYY~~ 071612

Task

Sample Name OTC532-z-OTC532-IS-0003-MMDDYY-z

Collection Date 071612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0905

Sample Purpose ~~Unknown~~ Invest.

Start Depth 7'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 9'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Logged By / Dat Chase Hill 07/16/12

Reviewed By / Dat

Sample Collection Log

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- Holloman AFB

Manager Christopher Long

* STATION 2

Location Code OTC532 (Bldg 924)

RFA / COC Number 144106-H016

Sample Number OTC532-IS-0004-~~MMDDYY~~ 071612

Task

Sample Name OTC532-z-OTC532-IS-0004-MMDDYY-z

Collection Date 071612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0910

Sample Purpose ~~Unknown~~ Invest.

Start Depth 14'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 16'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat [signature] 07/10/12 Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw A world of Solutions

Manager Christopher Long

* STATION 2

Location Code FIELDQC (Bldg 924)

RFA / COC Number 144106 - H016

Sample Number OTC532-IS-0005-~~MMDDYY~~-FD 071612

Task

Sample Name FIELDQC-z-OTC532-IS-0005-MMDDYY-FD-z

Collection Date 071612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0910

Sample Purpose ~~Unknown~~ Field QC

Start Depth 14'

QC Code FIELD DUPLICATE

End Depth 16'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	)(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat [signature] 07/10/12

Reviewed By / Dat

Sample Collection Log

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- Holloman AFB

Manager Christopher Long

* STATION 3

Location Code OTC532 (Bldg 924) RFA / COC Number 144106 - HO16

Sample Number OTC532-IS-0006-~~MMDDYY~~ 071612 Task

Sample Name OTC532-z-OTC532-IS-0006-MMDDYY-z Collection Date 071612

Sampling Method ~~Unknown~~ Hand Auger Sample Type ~~Unknown~~ Grab Collection Time 0930

Sample Purpose ~~Unknown~~ Invest. Start Depth 3'

QC Code NORMAL ENVIRONMENTAL SAMPL End Depth 5'

Sampling Equip Hand Auger Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB) SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chase Hill 07/16/12 Reviewed By / Dat

Sample Collection Log

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- Holloman AFB

Manager Christopher Long

* STATION 3

Location Code OTC532 (Bldg 924)

RFA / COC Number 144106-H016

Sample Number OTC532-IS-0007-~~MMDDYY~~ 071612

Task

Sample Name OTC532-z-OTC532-IS-0007-MMDDYY-z

Collection Date 071612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0945

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 12'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chase Hill 07/16/12 Reviewed By / Dat

Sample Collection Log

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- Holloman AFB

Manager Christopher Long

* STATION 4

Location Code OTC532 (Bldg 924)

RFA / COC Number 144106-H016

Sample Number OTC532-IS-0008-~~MMDDYY~~ 071612

Task

Sample Name OTC532-z-OTC532-IS-0008-MMDDYY-z

Collection Date 071612

Sampling Method ~~Unknown~~ Hand Auger

Sample Type ~~Unknown~~ Grab

Collection Time 1000

Sample Purpose ~~Unknown~~ Invest.

Start Depth 3'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 5'

Sampling Equip Hand Auger

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chad Jones 07/10/12

Reviewed By / Dat

Sample Collection Log

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Manager Christopher Long

* STATION 4

Location Code OTC532 (Bldg 924)

RFA / COC Number 144106 - H016

Sample Number OTC532-IS-0009-~~MMDDYY~~ 071612

Task

Sample Name OTC532-z-OTC532-IS-0009-MMDDYY-z

Collection Date 071612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1020

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 12'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase Hill 07/16/12

Reviewed By / Dat

Sample Collection Log

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Manager Christopher Long

* STATION 4

Location Code OTC532 (Bldg 924)

RFA / COC Number 144106 - H016

Sample Number OTC532-IS-0010-~~MMDDYY~~ 071612

Task

Sample Name OTC532-z-OTC532-IS-0010-MMDDYY-z

Collection Date 071612

Sampling Method ~~Unknown~~ Hand Auger

Sample Type ~~Unknown~~ Grab

Collection Time 1025

Sample Purpose ~~Unknown~~ Invest.

Start Depth 0'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 2'

Sampling Equip Hand Auger

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase Hill 07/16/12

Reviewed By / Dat

Sample Collection Log

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- Holloman AFB

Manager Christopher Long

* STATION 4

Location Code OTC532 (Bldg 924)

RFA / COC Number 144106-H016

Sample Number OTC532-IS-0011-~~MMDDYY~~ 071612

Task

Sample Name OTC532-z-OTC532-IS-0011-MMDDYY-z

Collection Date 071612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1025

Sample Purpose ~~Unknown~~ Invest.

Start Depth 9'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 11'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	)(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase Hill 07/10/12

Reviewed By / Dat

Sample Collection Log

Page: ~~19 of 49~~ 1/1

Shaw Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code ~~FIELDQC~~ IDW

RFA / COC Number HO 38

Sample Number ~~OTC644-GW-0441-MMDDYY-FD~~ LDY-IDWD1-090412

Sample Name ~~FIELDQC-2-OTC644-GW-0441-MMDDYY-FD-z~~

Task

Collection Date 09/04/2012

Sampling Method ~~Unknown~~ Composite

Sample Type ~~Unknown~~ Soil

Collection Time 1330

Sample Purpose ~~Unknown~~ IDW characterization

Start Depth NA

QC Code ~~FIELD DUPLICATE~~ NA

End Depth NA

Sampling Equip Stainless steel Trowel/Bowl/Aluminum

Sample Matrix ~~GROUND WATER~~ IDW Soil

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam LaThom, Hodu

Containers:

	Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
1)	VOCs by SW8260C TCLP VOCs	A	Unknown	~~3~~ 1	~~40~~ 8oz	~~ML~~	~~40 ml VOA Vials~~ Glass	~~HCL~~ Cool to 4°C
	~~SW8015B : GRO~~	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
2)	SVOCs by SW8270D TCLP SVOCs / other organics	EB	Unknown	~~2~~ 1	8	x oz	~~1 Liter Amber Glass~~ Glass	Cool to 4°
	~~SW8015B : GRO~~	B	Unknown	0	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~SW8015B : DRO~~	B	Unknown	2	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~PCBs by SW8082A~~ ~~TCLP~~	E	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
	~~Explosives by SW8330A~~	F	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
3)	~~Tritium by 906.0 Mod~~ RCI	C	Unknown	~~2~~ 1	~~1~~ 8oz		~~1 Liter Amber Glass~~ Glass	~~Cool to 4°C~~ Cool to 4°C
4)	Mercury by SW7470A TCLP Mercury	~~F~~ D	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~ oz	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
5)	Metals by SW6020A TCLP Metals	~~H~~ E	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
	~~Metals by SW6010C~~	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
	~~Total CN water by 335.4~~	I	Unknown	1	500	ML	~~500 ml Poly Container~~	NaOH
	~~TDS by 160.1~~	J	Unknown	1	500	ML	500 ml Poly Container	~~Cool to 4°~~

Comments: Composite Soil sample for TCLP analyses of IDW cuttings rolloff at Lay down Yard, 09/04/12

Sketch Location: Rolloff box Composite Sample @ Lay down Yard.

Analyses: TCLP VOCs, TCLP SVOCs, TCLP metals, TCLP Mercury, RCI

LDY = Lay down Yard

~~Shaw~~ *Logged By / Dat* Mel Hall *Reviewed By / Dat* _____

Sample Collection Log

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- Holloman AFB

Manager **Christopher Long**

Location Code BULK WATER TANK

RFA / COC Number 144106 H070

Sample Number HAFB-IDW-BULK WATER-0001-111612

Task 144106.JM20000

Sample Name HAFB-IDW-BULK WATER-0001-111612

Collection Date 11/16/12

Sampling Method BAILER

Sample Type GRAB

Collection Time 13:00

Sample Purpose CONFIRM IDW

Start Depth N/A

QC Code

End Depth N/A

Sampling Equip DISPOSABLE BAILER

Sample Matrix **WATER**

QC Partners:

(TB) (EB) (FB)

SampleTeam JH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	B	Unknown	4	8	8OZ	Amber Glass	Cool to 4°
SW8015 : ORO	C	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015 : DRO	C	Unknown	1	1	L	1 Liter Amber Glass	H2SO4
Metals by SW6020A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
METALS by SW6020A	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Mercury by SW7470A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Metals by SW6010C	D	Unknown	1	500	ML	500 ml Poly Container	HNO3
	E		1	500	ML	500 ml Poly Cont	Cool to 4°
SW8015 : GRO	F	Unknown	3	40	ML	40 ml VOA Vials	HCL

Comments: SAMPLE COLLECTED FROM BULK WATER STORAGE TANK AFTER ALL WATER DRUMS WERE CONSOLIDATED. SENT BOTH A PRESERVED AND UNPRESERVED 500ML POLY FOR METALS. SPOKE WITH LAB AND THEY SAID TO SEND UNPRESERVED, BUT I THINK MAYBE THEY MADE A MISTAKE.

Sketch Location:

Shaw Logged By / Dat

Reviewed By / Dat

Appendix E
Boring Logs

Boring ID: OT-C532-Station 1

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 924

Date Completed: 7/16/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Ground Elevation AMSL (ft):4040.62
Y Coordinate: 667268.7804
X Coordinate: 1678627.7722

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); tan; dry; loose; clayey; caliche layers. Note: occasional hard caliche nodules.	ML	Hand auger from 0 - 5 ft. Began drilling on 7/16/12.
5		OTC532-IS-0001-071612	NR		Same as above (0 ft); light brown; trace sand.		
10					Silty SAND (SM); white to tan; dry; soft; low plasticity; very fine sand; clayey. Same as above (8 ft); light brown; moist.	SM	
15		OTC532-IS-0002-071612	NR		Clayey SAND (SC); gray to brown (mottled); dry to moist.	SC	Total depth = 15 ft. Reached total depth on 7/16/12. **Water table not encountered in this boring.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:46 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C532-Station 2

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 924

Date Completed: 7/16/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Ground Elevation AMSL (ft):4041.24
Y Coordinate: 667248.570
X Coordinate: 1678632.497

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		Silty SAND (SM); light brown; dry; loose; very fine sand; trace clay; becoming mottled white. Note: caliche layer @ 2 ft.		Hand auger from 0 - 5 ft. Began drilling on 7/16/12.
5			NR		Same as above (0 ft); red (2.5YR 4/6).	SM	
		OTC532-IS-0003-071612			Same as above (0 ft); silty.		
10			NR		Clayey SAND (SC); light brown; moist; low plasticity; silty; clayey.	SC	
15		OTC532-IS-0004-071612 and OTC532-IS-0005-071612-FD	NR		▽ Silty SAND (SM); light brown; wet; clayey; becoming light gray clayey sand. Note: 2" gravel layer @ 16 ft.	SM	Wet zone @ 13 - 14 ft. Saturated @ 15 ft.
					Clayey SAND (SC); light gray; moist.	SC	Moist @ 17 ft.
20			NR				Total depth = 20 ft. Reached total depth on 7/16/12.
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 6/20/13 13:32 - Z:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C532-Station 3

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 924

Date Completed: 7/16/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Ground Elevation AMSL (ft):4040.86
Y Coordinate: 667225.7319
X Coordinate: 1678628.5410

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); dark reddish brown (5YR 3/4); mottled white; dry; soft; clayey. Note: caliche layers.	ML	Hand auger from 0 - 5 ft. Began drilling on 7/16/12.
5		OTC532-IS-0006-071612	NR		Silty SAND (SM); white to tan; dry; loose. Note: hard caliche layers. Same as above (3 ft); light to medium brown; dry; loose.	SM	
10		OTC532-IS-0007-071612	NR		Same as above (3 ft); light brown; moist; fine sand. Note: silty @ 9 ft. Clayey SAND (SC); tan; moist.	SC	
15			NR		Same as above (10 ft); mottled gray; dry; silty.		Total depth = 15 ft. Reached total depth on 7/16/12. **Water table not encountered in this boring.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:46 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C532-Station 4

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 924

Date Completed: 7/16/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Ground Elevation AMSL (ft):4040.50
Y Coordinate: 667192.2706
X Coordinate: 1678614.9649

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0							
		OTC532-IS-0010-071612	NR		SILT (ML); medium brown; dry; soft; clayey; trace sand.	ML	Hand auger from 0 - 5 ft. Began drilling on 7/16/12.
5		OTC532-IS-0008-071612	NR		Silty SAND (SM); tan; dry; loose; fine sand; silty; trace clay. Note: hard caliche layers 1 - 2" thick.	SM	
10		OTC532-IS-0011-071612	NR		SILT (ML); tan; moist; soft; trace fine sand; clayey.	ML	
		OTC532-IS-0009-071612			Silty SAND (SM); white to light gray; moist to slightly wet.	SM	Moist @ 11 - 11.5 ft.
15			NR		Clayey SAND (SC); light gray; moist; silty; clayey. Same as above (14 ft); dry. Same as above (14 ft); light brown; moist.	SC	Moist @ 17 - 17.5 ft.
20			NR		Lean CLAY (CL); white; moist; silty; trace sand.	CL	Total depth = 20 ft. Reached total depth on 7/16/12. **Water table not encountered. No well constructed at this location.
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:46 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Appendix F
Site Survey Data

Revised Rpt
09/11/2013
(re: TU/US-C513)
p. 7 of 10

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	682987.8550	1687022.9920	4098.16	BASE	682789.9107	1686534.0572
2	678390.1010	1678735.5020	4064.77	CP-52-P-19	678193.4892	1678248.9690
3	683252.1480	1680789.5360	4078.80	CP-55-JACK	683054.1271	1680302.4077
4	681667.1260	1694574.3780	4140.57	CP-56-AIR	681469.5645	1694083.2546
5	669733.4460	1682234.2110	4048.59	HAFB-07-07	669539.3431	1681746.6640
6	669695.2030	1718768.4150	4157.95	ALAMOAIR	669501.1112	1718270.2797
7	674362.7100	1713591.4300	4160.17	F248	674167.2655	1713094.7951
8	676850.6600	1718114.2590	4193.99	E-248	676654.4944	1717616.3133
50	691964.7620	1687201.2770	4140.90	MALONE	691764.2160	1686712.2905
51	662077.1700	1670356.4250	4077.10	BATE	661885.2861	1669872.3205
52	678390.1080	1678735.5040	4066.10	P 19	678193.4962	1678248.9710
53	644127.0780	1700529.8000	4039.00	MONT	643940.3964	1700036.9506
54	676850.6920	1718114.2670	4193.99	E 248	676654.5264	1717616.3213
55	683252.1970	1680789.5390	4080.20	JACK	683054.1761	1680302.4107
56	681667.0380	1694574.3640	4141.20	AIR	681469.4765	1694083.2406
82	678193.4999	1678248.9801	4064.92	P	677996.9451	1677762.5882
84	676654.5300	1717616.3305	4192.77	E	676458.4212	1717118.5291
85	683054.1798	1680302.4198	4079.02	JACK	682856.2163	1679815.4327
86	681469.4802	1694083.2497	4140.00	AIR	681271.9760	1693592.2686
100	685975.0760	1686614.9100	4101.87	OT-C534-PVC	685776.2660	1686126.0934
101	685975.4260	1686614.8310	4102.28	OT-C534-CASING	685776.6159	1686126.0145
102	685952.4860	1686626.9650	4101.89	OT-C534-W2-PVC	685753.6825	1686138.1449
103	685952.6870	1686626.9300	4102.33	OT-C534-W2-CASING	685753.8834	1686138.1099
104	685939.9110	1686581.7340	4101.89	OT-C534-W1-CASING	685741.1111	1686092.9270
105	685939.6450	1686581.7790	4101.57	OT-C534-W1-PVC	685740.8452	1686092.9720
106	685924.3640	1686619.9800	4101.81	OT-C534-W4-PVC	685725.5687	1686131.1620
107	685924.6590	1686619.8790	4102.23	OT-C534-W4-CASING	685725.8636	1686131.0610
108	685934.1180	1686578.3320	4101.72	OT-C534-LEACH-NG	685735.3198	1686089.5260
109	685935.7830	1686600.7340	4101.88	OT-C534-LEACH-NG	685736.9843	1686111.9215
110	685938.2680	1686607.0980	4101.88	OT-C534-LEACH-NG	685739.4686	1686118.2837
111	685951.4240	1686604.4600	4101.90	OT-C534-LEACH-NG	685752.6208	1686115.6465
112	685953.8200	1686601.1380	4101.88	OT-C534-LEACH-NG	685755.0161	1686112.3254
113	685953.2500	1686596.8650	4101.88	OT-C534-LEACH-NG	685754.4463	1686108.0537
114	685946.2830	1686578.3790	4101.81	OT-C534-LEACH-NG	685747.4813	1686089.5730
115	685945.3070	1686576.3400	4101.88	OT-C534-LEACH-NG	685746.5056	1686087.5346
116	685940.6850	1686575.6580	4101.79	OT-C534-LEACH-NG	685741.8849	1686086.8528
117	685952.3510	1686614.8200	4102.03	OT-C534-LEACH-NG	685753.5475	1686126.0035
118	685953.0040	1686623.0300	4102.13	OT-C534-LEACH-NG	685754.2004	1686134.2111
119	685945.6920	1686623.1960	4102.03	OT-C534-LEACH-NG	685746.8905	1686134.3770
120	685944.8810	1686615.5440	4101.97	OT-C534-LEACH-NG	685746.0797	1686126.7272
121	685948.0570	1686615.1700	4101.97	OT-C534-FLINE-NG	685749.2548	1686126.3534
122	685947.7680	1686606.3420	4101.81	OT-C534-FLINE-NG	685748.9659	1686117.5279
123	685953.2050	1686618.0690	4102.08	OT-C534-ENFLU-NG	685754.4013	1686129.2515
124	685968.5800	1686611.5870	4102.06	OT-C534-ENFLU-NG	685769.7718	1686122.7714
125	686021.5760	1686604.3860	4102.49	OT-C534-ENFLU-NG	685822.7525	1686115.5725
126	686051.0660	1686600.5520	4102.82	OT-C534-ENFLU-NG	685852.2339	1686111.7396
127	682943.9250	1686529.5770	4094.74	OT-C536-STATION1-NG	682745.9934	1686040.7852
128	682925.1900	1686534.9010	4094.63	OT-C536-STATION2-NG	682727.2639	1686046.1076
129	682914.0740	1686530.8350	4094.17	OT-C536-STATION3-NG	682716.1511	1686042.0428
130	682900.2750	1686534.1950	4094.40	MW-OT-C5361-CASING	682702.3561	1686045.4018
131	682900.0410	1686534.2560	4094.03	MW-OT-C5361-PVC	682702.1222	1686045.4628
132	682892.0960	1686514.3610	4094.08	OT-C536-LEACH-NG	682694.1795	1686025.5736
133	682905.9860	1686504.4840	4093.98	OT-C536-LEACH-NG	682708.0654	1686015.6994
134	682914.9460	1686505.2970	4094.10	OT-C536-LEACH-NG	682717.0228	1686016.5122
135	682919.4610	1686521.1490	4094.40	OT-C536-LEACH-NG	682721.5365	1686032.3596
136	682921.1340	1686534.7310	4094.42	OT-C536-LEACH-NG	682723.2091	1686045.9377
137	682919.5910	1686545.0230	4094.72	OT-C536-LEACH-NG	682721.6665	1686056.2267
138	682912.1700	1686551.2270	4094.60	OT-C536-LEACH-NG	682714.2477	1686062.4289
139	682897.7180	1686551.9240	4094.16	OT-C536-LEACH-NG	682699.7998	1686063.1257
140	682892.5110	1686549.8820	4094.18	OT-C536-LEACH-NG	682694.5943	1686061.0843
141	682922.3680	1686533.4440	4094.42	OT-C536-TANKPIT-NG	682724.4427	1686044.6510
142	682920.9800	1686525.5880	4094.39	OT-C536-TANKPIT-NG	682723.0551	1686036.7973
143	682928.0220	1686524.4280	4094.63	OT-C536-TANKPIT-NG	682730.0951	1686035.6377
144	682929.2370	1686532.7090	4094.62	OT-C536-TANKPIT-NG	682731.3097	1686043.9163
145	682949.7020	1686528.9800	4094.75	OT-C536-ENFLU-NG	682751.7688	1686040.1883
146	682921.2900	1686528.9090	4094.41	OT-C536-ENFLU-NG	682723.3650	1686040.1174
147	682916.2970	1686530.1310	4094.27	OT-C536-ENFLU-NG	682718.3735	1686041.3390
148	682877.6850	1686739.3620	4095.03	OT-C533-MW-CASING	682679.7726	1686250.5094
149	682877.4490	1686739.4350	4094.68	OT-C533-MW-PVC	682679.5367	1686250.5823
150	682884.2550	1686735.8390	4094.76	OT-C533-LEACH-NG	682686.3407	1686246.9874
151	682877.4700	1686734.1690	4094.84	OT-C533-LEACH-NG	682679.5577	1686245.3179

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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
152	682871.6400	1686736.6530	4094.83	OT-C533-LEACH-NG	682673.7294	1686247.8011
153	682869.4200	1686738.9370	4094.89	OT-C533-LEACH-NG	682671.5100	1686250.0845
154	682868.8760	1686741.4810	4094.99	OT-C533-LEACH-NG	682670.9662	1686252.6277
155	682867.8710	1686756.1100	4095.03	OT-C533-LEACH-NG	682669.9615	1686267.2525
156	682857.6950	1686766.0680	4095.35	OT-C533-LEACH-NG	682659.7884	1686277.2076
157	682855.8760	1686772.9280	4095.39	OT-C533-LEACH-NG	682657.9700	1686284.0656
158	682855.6590	1686783.4130	4095.46	OT-C533-LEACH-NG	682657.7530	1686294.5476
159	682855.5230	1686790.0690	4095.47	OT-C533-LEACH-NG	682657.6171	1686301.2017
160	682857.2270	1686794.8730	4095.42	OT-C533-LEACH-NG	682659.3206	1686306.0043
161	682858.6900	1686813.7880	4095.55	OT-C533-LEACH-NG	682660.7832	1686324.9138
162	682867.9360	1686816.7350	4095.32	OT-C533-LEACH-NG	682670.0265	1686327.8599
163	682880.0660	1686814.6740	4095.00	OT-C533-LEACH-NG	682682.1530	1686325.7995
164	682891.9700	1686818.7840	4094.82	OT-C533-LEACH-NG	682694.0535	1686329.9083
165	682901.1340	1686806.7570	4094.86	OT-C533-LEACH-NG	682703.2148	1686317.8848
166	682889.7110	1686785.0140	4094.98	OT-C533-LEACH-NG	682691.7952	1686296.1481
167	682889.3190	1686757.8750	4094.96	OT-C533-LEACH-NG	682691.4033	1686269.0170
168	682886.6550	1686745.7080	4094.83	OT-C533-LEACH-NG	682688.7400	1686256.8535
169	682895.8900	1686814.7130	4095.19	OT-C533-FFLUEN-NG	682697.9724	1686325.8385
170	682901.8890	1686814.2530	4095.86	OT-C533-FFLUEN-TPAD	682703.9696	1686325.3787
171	682901.5970	1686811.8220	4095.84	OT-C533-SEPTIC-TCONC	682703.6777	1686322.9484
172	682911.5820	1686810.3750	4095.77	OT-C533-SEPTIC-TCONC	682713.6598	1686321.5018
173	682912.4280	1686815.4170	4095.77	OT-C533-SEPTIC-TCONC	682714.5056	1686326.5423
174	682902.3730	1686816.8390	4095.84	OT-C533-SEPTIC-TCONC	682704.4535	1686327.9639
175	682912.0910	1686812.7560	4095.77	OT-C533-EFLUEN-TCONC	682714.1687	1686323.8821
176	682923.3600	1686810.9450	4095.29	OT-C533-EFLUEN-NG	682725.4344	1686322.0716
177	682942.2940	1686810.3140	4095.49	OT-C533-EFLUEN-NG	682744.3629	1686321.4408
178	682937.5080	1686805.9000	4095.30	OT-C533-STATION1-NG	682739.5783	1686318.0278
179	682906.2780	1686808.8380	4094.86	OT-C533-STATION2-NG	682708.3574	1686319.9652
180	682895.2770	1686813.2080	4094.98	OT-C533-STATION3-NG	682697.3595	1686324.3340
181	700191.9570	1695605.3730	4181.72	OT-C540-STATION1-ASP	699989.0266	1695113.9508
182	700173.9260	1695611.2520	4181.82	OT-C540-STATION2-NG	699971.0008	1695119.8281
183	700168.8930	1695604.5390	4181.39	OT-C540-STATION3-NG	699965.9693	1695113.1170
184	700151.2700	1695598.6630	4180.49	OT-C540-STATION4-NG	699948.3514	1695107.2427
185	700158.9630	1695593.9090	4180.86	OT-C540-LEACH-NG	699956.0422	1695102.4901
186	700150.2560	1695603.0840	4180.78	OT-C540-LEACH-NG	699947.3377	1695111.6625
187	700152.8330	1695609.6400	4180.81	OT-C540-LEACH-NG	699949.9139	1695118.2166
188	700155.1660	1695611.7200	4180.89	OT-C540-LEACH-NG	699952.2463	1695120.2960
189	700161.1020	1695611.3470	4181.11	OT-C540-LEACH-NG	699958.1805	1695119.9231
190	700163.7200	1695601.1600	4181.06	OT-C540-LEACH-NG	699960.7978	1695109.7390
191	700161.5790	1695596.1920	4181.05	OT-C540-LEACH-NG	699958.6574	1695104.7725
192	700165.7400	1695603.7570	4181.48	OT-C540-FFLUEN-NG	699962.8172	1695112.3353
193	700170.8520	1695608.8530	4181.93	OT-C540-FFLUEN-NG	699967.9277	1695117.4298
194	700170.7290	1695606.7600	4182.01	OT-C540-SEPTIC-NG	699967.8048	1695115.3374
195	700176.8760	1695605.4490	4181.91	OT-C540-SEPTIC-NG	699973.9500	1695114.0268
196	700177.5910	1695612.4300	4181.92	OT-C540-SEPTIC-NG	699974.6648	1695121.0058
197	700172.1930	1695613.9030	4182.05	OT-C540-SEPTIC-NG	699969.2683	1695122.4783
198	700177.7030	1695608.9790	4181.69	OT-C540-EFLUEN-NG	699974.7767	1695117.5558
199	700205.8220	1695608.1850	4181.85	OT-C540-EFLUEN-ASPH	700002.8876	1695116.7620
200	700246.4300	1695613.4690	4182.95	OT-C540-EFLUEN-ASPH	700043.4838	1695122.0445
201	700238.4930	1695614.0360	4182.51	OT-C540-BLDGCOR	700035.5491	1695122.6113
202	700228.4390	1695608.1640	4182.55	OT-C540-BLDGCOR	700025.4980	1695116.7410
203	700227.0510	1695568.0300	4182.87	OT-C540-BLDGCOR	700024.1104	1695076.6186
204	700236.9380	1695557.6950	4183.02	OT-C540-BLDGCOR	700033.9946	1695066.2866
205	688305.7410	1690609.5510	4126.46	TU\US-C507-STATION1-	688106.2555	1690119.5767
206	688309.7220	1690614.0760	4126.51	TU\US-C507-STATION2-	688110.2353	1690124.1004
207	688306.7130	1690619.4150	4126.45	TU\US-C507-STATION3-	688107.2272	1690129.4378
208	688313.7000	1690621.8280	4126.37	TU\US-C507-STATION4-	688114.2122	1690131.8501
209	688313.7950	1690607.6410	4126.36	TU\US-C507-STATION5-	688114.3071	1690117.6673
210	688304.0140	1690620.9730	4126.47	TU\US-C507-USTPIT-AS	688104.5290	1690130.9954
211	688304.3040	1690607.3010	4126.54	TU\US-C507-USTPIT-AS	688104.8189	1690117.3274
212	688317.4320	1690607.1780	4126.54	TU\US-C507-USTPIT-AS	688117.9431	1690117.2044
213	688317.6000	1690622.2860	4126.57	TU\US-C507-USTPIT-AS	688118.1110	1690132.3080
214	688320.7590	1690623.9670	4127.18	TU\US-C507-BLDGCOR	688121.2691	1690133.9885
215	688330.7630	1690627.7570	4125.65	TU\US-C507-BLDGCOR	688131.2702	1690137.7774
216	688318.5520	1690598.7120	4126.71	TU\US-C507-BLDGCOR	688119.0628	1690108.7408
217	688306.5580	1690598.9520	4126.69	TU\US-C507-BLDGCOR	688107.0722	1690108.9808
218	688287.5740	1690592.3200	4126.83	TU\US-C507-EXMW1	688088.0937	1690102.3507
219	688287.4600	1690625.9270	4126.36	TU\US-C507-EXMW2	688087.9798	1690135.9480
220	689216.8690	1680453.8850	4087.76	TU\US-C501-STATION4-	689017.1194	1679966.8540
221	689203.4000	1680450.4300	4087.80	TU\US-C501-STATION1-	689003.6543	1679963.4000
222	689227.9170	1680449.2880	4087.78	TU\US-C501-STATION2-	689028.1642	1679962.2584

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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
223	689201.2820	1680437.6020	4087.96	TU\US-C501-STATION3-	689001.5369	1679950.5757
224	689204.0090	1680426.7550	4087.80	TU\US-C501-STATION5-	689004.2631	1679939.7319
225	689200.5240	1680440.6650	4087.95	TU\US-C501-BLDGCOR-N	689000.7792	1679953.6379
226	689191.1430	1680432.8740	4088.07	TU\US-C501-BLDGCOR-N	688991.4009	1679945.8491
227	689202.0960	1680449.8730	4087.79	TU\US-C501-TANKPIT-N	689002.3507	1679962.8432
228	689201.5860	1680440.8210	4087.99	TU\US-C501-TANKPIT-N	689001.8408	1679953.7938
229	689191.7450	1680432.9310	4088.07	TU\US-C501-TANKPIT-N	688992.0027	1679945.9061
230	689195.4710	1680423.1750	4087.88	TU\US-C501-TANKPIT-N	688995.7276	1679936.1529
231	689207.1960	1680422.4490	4087.92	TU\US-C501-TANKPIT-N	689007.4492	1679935.4271
232	689229.2900	1680431.3210	4087.77	TU\US-C501-TANKPIT-N	689029.5368	1679944.2966
233	689231.6150	1680444.1310	4087.67	TU\US-C501-TANKPIT-N	689031.8611	1679957.1029
234	689227.5450	1680454.7320	4087.83	TU\US-C501-TANKPIT-N	689027.7923	1679967.7008
235	689218.0540	1680463.3780	4088.03	TU\US-C501-TANKPIT-N	689018.3041	1679976.3443
236	689209.0460	1680458.6260	4087.92	TU\US-C501-TANKPIT-N	689009.2987	1679971.5937
237	689237.1630	1680445.1670	4087.64	TU\US-C501-COMMLINE-	689037.4075	1679958.1386
238	689219.6050	1680436.9770	4088.00	TU\US-C501-COMMLINE-	689019.8546	1679949.9509
239	689199.7540	1680431.6770	4088.06	TU\US-C501-COMMLINE-	689000.0094	1679944.6525
240	689181.3550	1680425.0490	4088.20	TU\US-C501-COMMLINE-	688981.6157	1679938.0264
241	689162.6180	1680417.3900	4088.35	TU\US-C501-COMMLINE-	688962.8841	1679930.3696
242	689161.5970	1680417.5650	4088.56	TU\US-C501-COMMVAULT	688961.8634	1679930.5446
243	689157.8580	1680421.3400	4088.11	TU\US-C501-COMMVAULT	688958.1255	1679934.3185
244	689150.8680	1680414.5760	4088.10	TU\US-C501-COMMVAULT	688951.1375	1679927.5564
245	689154.6050	1680410.8830	4088.46	TU\US-C501-COMMVAULT	688954.8735	1679923.8645
246	687246.6430	1686873.0010	4105.82	OT-C535-STATION1-NG	687047.4644	1686384.1096
247	687270.5400	1686861.6690	4105.63	OT-C535-STATION2-NG	687071.3545	1686372.7809
248	687282.8340	1686866.7860	4105.85	OT-C535-STATION3-NG	687083.6449	1686377.8964
249	687303.5940	1686788.5490	4105.12	OT-C535-STATION4-NG	687104.3989	1686299.6821
250	687291.9640	1686793.7970	4105.27	OT-C535-LEACH-NG	687092.7723	1686304.9286
251	687304.7930	1686782.8770	4105.17	OT-C535-LEACH-NG	687105.5976	1686294.0117
252	687323.6740	1686798.1880	4105.34	OT-C535-LEACH-NG	687124.4731	1686309.3183
253	687319.7080	1686817.5380	4105.82	OT-C535-LEACH-NG	687120.5083	1686328.6627
254	687307.4400	1686838.9610	4105.76	OT-C535-LEACH-NG	687108.2438	1686350.0795
255	687297.0830	1686856.5380	4106.04	OT-C535-LEACH-NG	687097.8898	1686367.6514
256	687290.0540	1686837.9200	4105.59	OT-C535-LEACH-NG	687090.8628	1686349.0388
257	687291.3760	1686806.0200	4105.33	OT-C535-LEACH-NG	687092.1845	1686317.1480
258	687284.5890	1686864.5150	4106.11	OT-C535-FFLUEN-NG	687085.3994	1686375.6261
259	687276.8290	1686868.4490	4106.19	OT-C535-FFLUEN-NG	687077.6417	1686379.5589
260	687276.0820	1686870.8490	4106.28	OT-C535-SEPTIC-NG	687076.8949	1686381.9583
261	687263.3720	1686869.7190	4105.87	OT-C535-SEPTIC-NG	687064.1886	1686380.8286
262	687263.7200	1686863.5770	4105.95	OT-C535-SEPTIC-NG	687064.5365	1686374.6884
263	687276.4840	1686862.8870	4106.07	OT-C535-SEPTIC-NG	687077.2968	1686373.9986
264	687263.5270	1686868.1150	4105.92	OT-C535-EFLUEN-NG	687064.3435	1686379.2250
265	687228.9570	1686874.1570	4105.71	OT-C535-EFLUEN-NG	687029.7836	1686385.2653
266	687235.2230	1686881.4610	4106.05	OT-C535-BLDGCOR-NG	687036.0477	1686392.5672
267	687225.9150	1686892.3360	4105.90	OT-C535-BLDGCOR-NG	687026.7424	1686403.4390
268	687232.0250	1686844.5370	4105.92	OT-C535-BLDGCOR-NG	687032.8507	1686355.6539
269	687221.4890	1686835.3400	4105.63	OT-C535-BLDGCOR-NG	687022.3177	1686346.4595
270	677637.2460	1692755.6660	4110.24	TU/US-C505-MW1-CASIN	677440.8524	1692265.0697
271	677636.9990	1692755.6590	4109.84	TU/US-C505-MW1-PVC	677440.6055	1692265.0627
272	677634.4160	1692722.3930	4110.42	TU/US-C505-WELLATEMP	677438.0233	1692231.8064
273	677659.4620	1692742.2400	4110.34	TU/US-C505-WELLATEMP	677463.0620	1692251.6476
274	677701.9500	1692799.3200	4110.17	TU/US-C505-USTPIT-NG	677505.5377	1692308.7111
275	677701.3830	1692789.3010	4110.35	TU/US-C505-USTPIT-NG	677504.9708	1692298.6950
276	677711.5570	1692789.5280	4110.64	TU/US-C505-USTPIT-NG	677515.1419	1692298.9219
277	677710.8940	1692799.1130	4110.24	TU/US-C505-USTPIT-NG	677514.4791	1692308.5041
278	677707.4060	1692790.0820	4110.35	TU/US-C505-STATION1-	677510.9921	1692299.4757
279	677702.3100	1692795.0710	4110.20	TU/US-C505-STATION2-	677505.8976	1692304.4633
280	677705.6610	1692797.9500	4110.13	TU/US-C505-STATION3-	677509.2476	1692307.3415
281	677710.4770	1692793.8740	4110.09	TU/US-C505-STATION4-	677514.0622	1692303.2666
282	677706.4200	1692793.8350	4110.12	TU/US-C505-STATION5-	677510.0064	1692303.2276
283	677694.5060	1692779.7220	4110.88	TU/US-C505-BLDGCOR-N	677498.0958	1692289.1187
284	677704.1940	1692790.4680	4110.28	TU/US-C505-BLDGCOR-N	677507.7810	1692299.8616
285	677754.5670	1692783.0890	4110.79	TU/US-C505-BLDGCOR-N	677558.1394	1692292.4848
286	677743.8570	1692795.1680	4110.70	TU/US-C505-BLDGCOR-N	677547.4325	1692304.5603
287	686300.2320	1672933.0350	4060.98	OT-C542-MW-CASING-	686101.3277	1672448.1837
288	686300.2350	1672933.0550	4060.98	OT-C542-MW-PVC	686101.3307	1672448.2037
289	686274.4020	1672914.6520	4061.01	OT-C542-LEACH-NG	686075.5052	1672429.8061
290	686289.6710	1672938.5250	4060.76	OT-C542-LEACH-NG	686090.7698	1672453.6721
291	686294.6900	1672941.1720	4060.83	OT-C542-LEACH-NG	686095.7873	1672456.3184
292	686301.6970	1672938.9490	4060.85	OT-C542-LEACH-NG	686102.7923	1672454.0960
293	686305.7170	1672936.2850	4060.87	OT-C542-LEACH-NG	686106.8111	1672451.4328

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
294	686308.0670	1672931.0550	4060.89	OT-C542-LEACH-NG	686109.1604	1672446.2043
295	686304.8000	1672917.9090	4060.82	OT-C542-LEACH-NG	686105.8944	1672433.0621
296	686292.3740	1672901.2590	4060.90	OT-C542-LEACH-NG	686093.4720	1672416.4169
297	686283.4190	1672906.7050	4060.97	OT-C542-FFLUEN-NG	686084.5196	1672421.8614
298	686280.3770	1672902.6520	4060.94	OT-C542-FFLUEN-NG	686081.4785	1672417.8095
299	686276.9070	1672904.6420	4060.95	OT-C542-SEPTIC-NG	686078.0095	1672419.7990
300	686271.2980	1672896.9550	4060.80	OT-C542-SEPTIC-NG	686072.4021	1672412.1142
301	686281.9530	1672889.9350	4060.83	OT-C542-SEPTIC-NG	686083.0540	1672405.0962
302	686287.0950	1672896.6800	4060.88	OT-C542-SEPTIC-NG	686088.1945	1672411.8393
303	686285.7900	1672894.7150	4060.83	OT-C542-EFLUEN-NG	686086.8899	1672409.8748
304	686299.2270	1672887.1560	4060.87	OT-C542-EFLUEN-NG	686100.3230	1672402.3180
305	686310.9860	1672881.5880	4061.18	OT-C542-EFLUEN-NG	686112.0786	1672396.7516
306	686294.2970	1672858.0380	4060.90	OT-C542-BLDGCOR-NG	686095.3944	1672373.2085
307	686295.8820	1672844.1310	4061.28	OT-C542-BLDGCOR-NG	686096.9790	1672359.3055
308	686345.1390	1672922.4560	4060.89	OT-C542-BLDGCOR-NG	686146.2217	1672437.6078
309	686358.9780	1672924.0940	4061.42	OT-C542-BLDGCOR-NG	686160.0567	1672439.2453
310	686291.8860	1672885.1500	4060.65	OT-C542-STATION1-NG	686092.9841	1672400.3126
311	686275.2730	1672891.5340	4060.63	OT-C542-STATION2-NG	686076.3760	1672406.6948
312	686281.5390	1672904.6340	4060.73	OT-C542-STATION2-NG	686082.6401	1672419.7910
313	685750.1690	1671530.2910	4055.60	OT-C543-STATION2-NG	685551.4241	1671045.8463
314	685734.0730	1671548.8090	4055.84	OT-C543-STATION2	685535.3328	1671064.3589
315	685727.7350	1671514.3350	4055.33	OT-C543-STATION3	685528.9966	1671029.8949
316	685749.4390	1671546.6740	4055.91	OT-C543-EXSEPTIC	685550.6944	1671062.2245
317	685732.6430	1671545.5190	4055.74	OT-C543-EXSEPTIC	685533.9032	1671061.0699
318	685741.2600	1671557.0720	4056.32	OT-C543-EXSEPTIC	685542.5177	1671072.6195
319	685738.1510	1671537.7290	4055.62	OT-C543-EXSEPTIC	685539.4096	1671053.2821
320	685734.3520	1671541.2760	4055.65	OT-C543-FFLUEN	685535.6117	1671056.8281
321	685716.0920	1671515.5090	4055.04	OT-C543-FFLUEN	685517.3570	1671031.0686
322	685708.2650	1671520.5800	4055.23	OT-C543-LEACH	685509.5323	1671036.1381
323	685688.3040	1671512.0560	4055.52	OT-C543-LEACH	685489.5771	1671027.6166
324	685669.5610	1671502.3840	4055.36	OT-C543-LEACH	685470.8395	1671017.9474
325	685659.9210	1671495.2130	4055.04	OT-C543-LEACH	685461.2023	1671010.7784
326	685670.4020	1671495.5660	4055.43	OT-C543-MW-CASING	685471.6803	1671011.1313
327	685670.1370	1671495.6580	4055.13	OT-C543-MW-PVC	685471.4153	1671011.2233
328	685682.2550	1671485.7460	4055.16	OT-C543-LEACH	685483.5298	1671001.3142
329	685699.8070	1671491.2750	4054.76	OT-C543-LEACH	685501.0767	1671006.8416
330	685710.4840	1671499.0550	4055.06	OT-C543-LEACH	685511.7506	1671014.6193
331	685721.5030	1671508.4730	4055.40	OT-C543-LEACH	685522.7664	1671024.0346
332	685794.8190	1671498.3320	4056.84	OT-C543-EFLUEN	685596.0612	1671013.8965
333	685809.3600	1671495.0820	4059.27	OT-C543-BLDGCOR	685610.5980	1671010.6475
334	685776.9050	1671465.9090	4060.02	OT-C543-BLDGCOR	685578.1524	1670981.4829
335	685785.4230	1671455.8900	4060.26	OT-C543-BLDGCOR	685586.6679	1670971.4668
336	685744.8400	1671542.1950	4055.76	OT-C543-EFLUEN	685546.0967	1671057.7468
337	685303.6520	1671072.3550	4048.79	OT-C544-MW-CASING	685105.0365	1670588.0430
338	685303.3550	1671072.2840	4048.52	OT-C544-MW-PVC	685104.7396	1670587.9720
339	685349.4970	1671083.9730	4052.43	OT-C544-STATION1	685150.8683	1670599.6576
340	685342.4960	1671086.5980	4051.55	OT-C544-STATION1	685143.8693	1670602.2819
341	685336.0530	1671085.0120	4050.99	OT-C544-STATION1	685137.4282	1670600.6963
342	685336.7000	1671089.5480	4051.15	OT-C544-SEPTIC	685138.0750	1670605.2310
343	685338.4520	1671075.7050	4051.30	OT-C544-SEPTIC	685139.8265	1670591.3920
344	685347.8050	1671077.3720	4052.23	OT-C544-SEPTIC	685149.1768	1670593.0585
345	685345.6600	1671089.9410	4052.38	OT-C544-SEPTIC	685147.0324	1670605.6239
346	685356.1020	1671079.9660	4041.22	OT-C544-EFLUEN	685157.4713	1670595.6518
347	685347.2700	1671081.8770	4052.36	OT-C544-EFLUEN	685148.6419	1670597.5622
348	685337.4940	1671082.4320	4051.31	OT-C544-FFLUEN	685138.8687	1670598.1171
349	685335.1290	1671082.2690	4051.14	OT-C544-FFLUEN	685136.5044	1670597.9541
350	685336.2280	1671075.8560	4050.85	OT-C544-LEACH	685137.6031	1670591.5430
351	685323.3310	1671071.0830	4049.91	OT-C544-LEACH	685124.7098	1670586.7714
352	685297.8990	1671068.1360	4048.16	OT-C544-LEACH	685099.2852	1670583.8252
353	685296.9990	1671078.2660	4047.94	OT-C544-LEACH	685098.3855	1670593.9523
354	685317.0900	1671090.9580	4049.62	OT-C544-LEACH	685118.4707	1670606.6406
355	685334.6940	1671090.0750	4050.81	OT-C544-LEACH	685136.0696	1670605.7579
356	685360.4020	1671127.4140	4053.89	OT-C544-BLDGCOR	685161.7701	1670643.0860
357	685349.8450	1671114.5020	4052.32	OT-C544-BLDGCOR	685151.2162	1670630.1778
358	685360.3480	1671033.1240	4052.96	OT-C544-BLDGCOR	685161.7161	1670548.8234
359	685371.1230	1671022.2010	4053.70	OT-C544-BLDGCOR	685172.4880	1670537.9035
360	669828.5970	1693339.1960	4077.44	TU/US-C503-STATION1	669634.4665	1692848.4306
361	669823.8520	1693340.4930	4077.30	TU/US-C503-STATION2	669629.7229	1692849.7272
362	669816.1660	1693331.0930	4077.32	TU/US-C503-STATION3	669622.0391	1692840.3299
363	669804.9830	1693324.1990	4077.14	TU/US-C503-STATION5	669610.8594	1692833.4379
364	669830.2120	1693344.6950	4077.63	TU/US-C503-STATION4	669636.0811	1692853.9280

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
365	669820.3680	1693343.5050	4078.10	TU/US-C503-USTTANK	669626.2399	1692852.7383
366	669826.9160	1693337.2450	4077.78	TU/US-C503-USTTANK	669632.7860	1692846.4802
367	669831.7020	1693342.9300	4077.73	TU/US-C503-USTTANK	669637.5706	1692852.1635
368	669817.5060	1693300.2710	4077.28	TU/US-C503-BLDGCOR	669623.3788	1692809.5169
369	669817.0280	1693314.4610	4077.69	TU/US-C503-BLDGCOR	669622.9009	1692823.7028
370	669870.4630	1693326.6030	4077.24	TU/US-C503-BLDGCOR	669676.3204	1692835.8412
371	669857.6770	1693326.9550	4077.12	TU/US-C503-BLDGCOR	669663.5381	1692836.1931
372	669799.9830	1693280.8270	4076.53	TU/US-C503-BLDGCOR	669605.8608	1692790.0785
373	669786.0040	1693280.0690	4077.00	TU/US-C503-BLDGCOR	669591.8859	1692789.3207
374	669753.1970	1693299.5360	4076.55	TU/US-C503-MW1-CASIN	669559.0884	1692808.7821
375	669753.0160	1693299.6510	4076.22	TU/US-C503-MW1-PVC	669558.9075	1692808.8971
376	669717.9520	1693348.6000	4074.92	TU/US-C503-MW3-PVC	669523.8536	1692857.8319
377	669718.0930	1693348.2730	4075.65	TU/US-C503-MW3-CASIN	669523.9946	1692857.5050
378	669746.8950	1693329.2100	4076.92	TU/US-C503-BLDGCOR	669552.7882	1692838.4475
379	669747.5820	1693308.1150	4076.21	TU/US-C503-BLDGCOR	669553.4750	1692817.3586
380	669906.5180	1693361.1640	4077.43	TU/US-C503-MW2-CASIN	669712.3650	1692870.3922
381	669906.2520	1693361.2650	4077.07	TU/US-C503-MW2-PVC	669712.0990	1692870.4932
382	669887.0390	1693344.8910	4077.53	TU/US-C503-BLDGCOR	669692.8916	1692854.1239
383	669886.0230	1693359.0930	4077.99	TU/US-C503-BLDGCOR	669691.8759	1692868.3218
384	670862.3470	1691695.2520	4072.78	TU/US-C500-MW1-CASIN	670667.9169	1691204.9630
385	670862.1340	1691695.4850	4072.39	TU/US-C500-MW1-PVC	670667.7040	1691205.1960
386	670897.1420	1691671.0590	4072.25	TU/US-C500-MW2-PVC	670702.7019	1691180.7771
387	670897.3420	1691670.8340	4072.66	TU/US-C500-MW2-CASIN	670702.9018	1691180.5521
388	670997.2710	1691721.0890	4072.90	TU/US-C500-MW3-CASIN	670802.8018	1691230.7926
389	670996.9840	1691721.2540	4072.41	TU/US-C500-MW3-PVC	670802.5149	1691230.9575
390	670952.1640	1691699.4910	4072.04	TU/US-C500-STATION1	670757.7079	1691209.2008
391	670948.0960	1691682.1740	4072.36	TU/US-C500-STATION4	670753.6411	1691191.8888
392	670936.4590	1691683.8290	4072.05	TU/US-C500-STATION5	670742.0075	1691193.5434
393	670929.6330	1691690.0950	4072.11	TU/US-C500-STATION2	670735.1834	1691199.8075
394	670923.0530	1691673.0510	4072.18	TU/US-C500-STATION3	670728.6054	1691182.7685
395	670946.5050	1691708.7370	4072.40	TU/US-C500-USTPIT	670752.0506	1691218.4441
396	670961.7540	1691693.8260	4072.62	TU/US-C500-USTPIT	670767.2951	1691203.5375
397	670931.1680	1691662.3970	4072.93	TU/US-C500-USTPIT	670736.7180	1691172.1176
398	670915.4940	1691676.4560	4072.43	TU/US-C500-USTPIT	670721.0485	1691186.1725
399	670921.7940	1691667.6910	4072.61	TU/US-C500-BLDGCOR	670727.3467	1691177.4100
400	670938.3020	1691685.3670	4072.19	TU/US-C500-BLDGCOR	670743.8499	1691195.0809
401	670954.8550	1691686.5260	4072.52	TU/US-C500-BLDGCOR	670760.3981	1691196.2396
402	670964.2580	1691691.8600	4072.50	TU/US-C500-BLDGCOR	670769.7984	1691201.5720
403	670981.1410	1691692.8760	4072.84	TU/US-C500-BLDGCOR	670786.6765	1691202.5877
404	681138.2190	1690535.4430	4109.80	OT-C538-MW1-CASING	680940.8108	1690045.4902
405	681137.9660	1690535.5040	4109.43	OT-C538-MW1-PVC	680940.5579	1690045.5512
406	681154.3000	1690506.8540	4109.64	OT-C538-STATION3	680956.8871	1690016.9095
407	681170.7650	1690504.3700	4110.30	OT-C538-STATION2	680973.3473	1690014.4262
408	681207.7160	1690542.9160	4110.07	OT-C538-STATION1	681010.2876	1690052.9610
409	681171.2020	1690513.1430	4110.35	OT-C538-SEPTIC	680973.7842	1690023.1966
410	681160.8350	1690514.8700	4110.22	OT-C538-SEPTIC	680963.4202	1690024.9231
411	681157.5830	1690502.2430	4109.87	OT-C538-SEPTIC	680960.1692	1690012.2998
412	681168.6240	1690500.8410	4110.30	OT-C538-SEPTIC	680971.2070	1690010.8982
413	681157.7430	1690507.8780	4109.92	OT-C538-FFLUEN	680960.3291	1690017.9332
414	681149.7900	1690513.8560	4109.82	OT-C538-FFLUEN	680952.3784	1690023.9094
415	681146.2870	1690511.1610	4109.76	OT-C538-LEACH	680948.8764	1690021.2152
416	681140.0690	1690516.2140	4109.76	OT-C538-LEACH	680942.6602	1690026.2667
417	681131.8360	1690535.6580	4109.59	OT-C538-LEACH	680934.4296	1690045.7051
418	681142.3480	1690541.6090	4109.45	OT-C538-LEACH	680944.9386	1690051.6544
419	681148.4850	1690524.6340	4109.80	OT-C538-LEACH	680951.0738	1690034.6843
420	681152.9240	1690518.6140	4110.01	OT-C538-LEACH	680955.5115	1690028.6661
421	681171.0630	1690513.0040	4110.32	OT-C538-EFLUEN	680973.6453	1690023.0577
422	681199.3120	1690534.6340	4109.92	OT-C538-EFLUEN	681001.8861	1690044.6814
423	681311.9210	1690619.8910	4111.94	OT-C538-EFLUEN	681114.4624	1690129.9137
424	681378.0600	1690614.8720	4112.52	OT-C538-EFLUEN	681180.5823	1690124.8962
425	681511.9950	1690621.0250	4112.35	OT-C538-EFLUEN-C/O	681314.4785	1690131.0474
426	681543.8210	1690614.3290	4112.13	OT-C538-EFLUEN-C/O	681346.2952	1690124.3533
427	681545.1500	1690624.0320	4110.59	OT-C538-EFLUEN	681347.6238	1690134.0535
428	681526.9290	1690617.7410	4112.19	OT-C538-BLDGCOR	681329.4081	1690127.7643
429	681516.5600	1690627.6780	4112.22	OT-C538-BLDGCOR	681319.0421	1690137.6984
430	681517.0030	1690674.6590	4112.55	OT-C538-BLDGCOR	681319.4850	1690184.6658
431	681526.9640	1690685.0850	4112.68	OT-C538-BLDGCOR	681329.4431	1690195.0888
432	681610.3380	1690617.1910	4112.15	OT-C538-BLDGCOR	681412.7929	1690127.2145
433	681620.0290	1690626.9090	4112.29	OT-C538-BLDGCOR	681422.4811	1690136.9297
434	681248.7970	1690511.7190	4110.11	OT-C537-STATION1	681051.3567	1690021.7731
435	681230.2540	1690505.9940	4109.96	OT-C537-STATION2	681032.8191	1690016.0497

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
436	681220.0430	1690509.7920	4110.12	OT-C537-STATION3	681022.6111	1690019.8466
437	681224.9030	1690501.6020	4109.95	OT-C537-SEPTICDRY	681027.4697	1690011.6590
438	681224.2220	1690518.0560	4110.28	OT-C537-SEPTICDRY	681026.7889	1690028.1082
439	681236.7540	1690518.9910	4110.31	OT-C537-SEPTICDRY	681039.3172	1690029.0429
440	681236.4080	1690501.8520	4110.13	OT-C537-SEPTICDRY	681038.9713	1690011.9089
441	681237.2180	1690508.8330	4110.12	OT-C537-INLINE	681039.7811	1690018.8879
442	681311.7430	1690515.4440	4111.03	OT-C537-INLINE	681114.2845	1690025.4970
443	670561.7210	1680587.5740	4050.10	TU/US-C506-MW2-CASIN	670367.3781	1680100.5043
444	670561.4170	1680587.6760	4049.68	TU/US-C506-MW2-PVC	670367.0742	1680100.6062
445	670504.3430	1680580.0920	4050.14	TU/US-C506-MW1-PVC	670310.0167	1680093.0244
446	670504.5340	1680580.0020	4050.56	TU/US-C506-MW1-CASIN	670310.2076	1680092.9345
447	670508.2600	1680580.6030	4050.26	TU/US-C506-USTTANK	670313.9326	1680093.5353
448	670507.1490	1680575.9500	4050.27	TU/US-C506-USTTANK	670312.8219	1680088.8836
449	670517.9280	1680578.9030	4050.27	TU/US-C506-USTTANK	670323.5978	1680091.8358
450	670517.4300	1680574.2280	4050.28	TU/US-C506-USTTANK	670323.0999	1680087.1621
451	670507.9350	1680578.1630	4050.18	TU/US-C506-STATION1	670313.6077	1680091.0960
452	670513.3690	1680579.8330	4050.20	TU/US-C506-STATION2	670319.0401	1680092.7655
453	670517.9640	1680576.4150	4050.25	TU/US-C506-STATION3	670323.6338	1680089.3485
454	670511.2330	1680575.3810	4050.12	TU/US-C506-STATION4	670316.9047	1680088.3148
455	670512.5770	1680577.6370	4050.16	TU/US-C506-STATION5	670318.2483	1680090.5702
456	670485.1820	1680557.6150	4050.53	TU/US-C506-EXMW1-CAS	670290.8613	1680070.5540
457	670484.8980	1680557.6790	4050.38	TU/US-C506-EXMW1-PVC	670290.5773	1680070.6179
458	670494.8180	1680553.5430	4050.36	TU/US-C506-BLDGCOR	670300.4945	1680066.4831
459	670506.7310	1680561.7710	4050.38	TU/US-C506-BLDGCOR	670312.4040	1680074.7088
460	670510.1770	1680607.5970	4050.36	TU/US-C506-BLDGCOR	670315.8490	1680120.5215
461	670507.2460	1680618.1900	4050.39	TU/US-C506-BLDGCOR	670312.9189	1680131.1114
462	672564.5350	1692766.5990	4084.67	OT-C530-STATION1	672369.6116	1692275.9995
463	672567.1650	1692774.7240	4084.79	OT-C530-STATION2	672372.2409	1692284.1222
464	672567.5210	1692771.2850	4084.93	OT-C530-ACTSEPTIC	672372.5967	1692280.6842
465	672572.0780	1692767.3740	4084.89	OT-C530-ACTSEPTIC	672377.1524	1692276.7743
466	672575.8660	1692771.9070	4084.91	OT-C530-ACTSEPTIC	672380.9393	1692281.3060
467	672571.4280	1692775.8290	4084.95	OT-C530-ACTSEPTIC	672376.5026	1692285.2269
468	672569.6900	1692769.3550	4084.91	OT-C530-INLINE	672374.7651	1692278.7547
469	672563.6000	1692772.1360	4084.83	OT-C530-MW-CASING	672368.6769	1692281.5349
470	672563.2920	1692772.2960	4084.49	OT-C530-MW-PVC	672368.3690	1692281.6949
471	672509.9810	1692700.4750	4085.41	OT-C530-INLINE	672315.0734	1692209.8947
472	672538.3940	1692677.7240	4085.37	OT-C530-BLDGCOR	672343.4782	1692187.1503
473	672538.9710	1692663.8680	4085.27	OT-C530-BLDGCOR	672344.0550	1692173.2983
474	672478.3960	1692731.8290	4085.45	OT-C530-BLDGCOR	672283.4976	1692241.2396
475	672485.2490	1692739.1720	4085.12	OT-C530-BLDGCOR	672290.3486	1692248.5805
476	685978.3640	1686617.0530	4101.95	OT-C534-STATION1	685779.5530	1686128.2358
477	685949.9370	1686623.2970	4101.80	OT-C534-STATION2	685751.1342	1686134.4780
478	686041.6810	1686591.0650	4102.58	OT-C534-BLDGCOR	685842.8517	1686102.2553
479	686050.4200	1686580.6970	4102.78	OT-C534-BLDGCOR	685851.5881	1686091.8903
480	686053.7100	1686616.8100	4102.90	OT-C534-BLDGCOR	685854.8772	1686127.9929
481	686043.1140	1686607.6280	4102.82	OT-C534-BLDGCOR	685844.2842	1686118.8135
482	670482.5190	1680558.2400	4050.60	TU/US-C506-MW3-CASIN	670288.1990	1680071.1788
483	670482.3210	1680558.1750	4050.11	TU/US-C506-MW3-PVC	670288.0011	1680071.1138
484	669451.6250	1685381.2210	4054.88	TU/US-C515-STATION1	669257.6038	1684892.7620
485	669456.5920	1685373.9060	4054.66	TU/US-C515-STATION2	669262.5694	1684885.4491
486	669447.7270	1685364.3830	4054.13	TU/US-C515-STATION3	669253.7069	1684875.9289
487	669442.7430	1685375.3260	4054.34	TU/US-C515-STATION4	669248.7244	1684886.8687
488	669450.0780	1685373.9310	4054.62	TU/US-C515-STATION5	669256.0572	1684885.4741
489	669529.8630	1685390.3120	4053.57	TU/US-C515-MW3-PVC	669335.8191	1684901.8503
490	669530.0710	1685390.1630	4053.84	TU/US-C515-MW3-CASIN	669336.0271	1684901.7014
491	669347.3380	1685357.3580	4053.37	TU/US-C515-MW2-CASIN	669153.3470	1684868.9059
492	669347.0390	1685357.4240	4052.93	TU/US-C515-MW2-PVC	669153.0481	1684868.9719
493	669367.7310	1685396.1250	4053.43	TU/US-C515-MW1-PVC	669173.7341	1684907.6617
494	669368.0180	1685396.0880	4053.86	TU/US-C515-MW1-CASIN	669174.0210	1684907.6247
495	669413.7390	1685386.4140	4054.97	TU/US-C515-BLDGCOR	669219.7288	1684897.9535
496	669405.0760	1685397.5400	4056.39	TU/US-C515-BLDGCOR	669211.0683	1684909.0762
497	669442.6490	1685383.8010	4054.90	TU/US-C515-TANKPIT	669248.6304	1684895.3412
498	669458.4310	1685381.6630	4055.08	TU/US-C515-TANKPIT	669264.4078	1684893.2039
499	669454.7400	1685363.6010	4054.47	TU/US-C515-TANKPIT	669260.7179	1684875.1471
500	669440.8050	1685364.3540	4054.07	TU/US-C515-TANKPIT	669246.7869	1684875.8999
501	669474.3460	1685377.9770	4054.82	TU/US-C515-BLDGCOR	669280.3182	1684889.5189
502	669485.4880	1685386.3880	4055.07	TU/US-C515-BLDGCOR	669291.4570	1684897.9275
503	669257.8420	1685415.0700	4053.20	TU/US-C513-STATION3	669063.8770	1684926.6012
504	669241.6200	1685431.8260	4053.43	TU/US-C513-STATION2	669047.6597	1684943.3523
505	669234.6840	1685421.2410	4053.75	TU/US-C513-STATION5	669040.7257	1684932.7704
506	669232.2550	1685409.8190	4053.42	TU/US-C513-STATION4	669038.2974	1684921.3517

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

Corrections

Point #515
TU/US-515-MW3 PVC

Point #518
TU/US-515-MW2

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
507	669220.1400	1685422.8010	4053.52	TU/US-C513-STATION1	669026.1859	1684934.3299
508	669222.4590	1685431.2530	4053.64	TU/US-C513-TANKPIT	669028.5042	1684942.7795
509	669219.3990	1685411.0450	4054.92	TU/US-C513-TANKPIT	669025.4451	1684922.5773
510	669260.7320	1685426.0370	4053.70	TU/US-C513-TANKPIT	669066.7661	1684937.5650
511	669277.6950	1685433.5720	4053.31	TU/US-C513-MW2-CASIN	669083.7242	1684945.0978
512	669243.5650	1685418.8110	4054.36	TU/US-C513-TRANSPAD	669049.6041	1684930.3411
513	669236.4970	1685419.8090	4054.30	TU/US-C513-TRANSPAD	669042.5381	1684931.3388
514	669235.5680	1685411.9050	4054.57	TU/US-C513-TRANSPAD	669041.6094	1684923.4371
515	669277.6850	1685433.6210	4053.26	TU/US-C513-MW2-C[illegible] PVC	669083.7142	1684945.1468 → MW3
516	669188.9570	1685441.5400	4053.76	TU/US-C513-MW1-CASIN	668995.0119	1684953.0635
517	669188.7180	1685441.6230	4053.31	TU/US-C513-MW1-PVC	668994.7730	1684953.1465
518	669175.0530	1685411.5360	4053.78	TU/US-C513-MW3-PVC	668981.1120	1684923.0682 → MW2
519	669175.2900	1685411.4450	4054.15	TU/US-C513-MW3-CASIN	668981.3489	1684922.9772
520	669194.6820	1685411.4540	4054.72	TU/US-C513-BLDGCOR	669000.7353	1684922.9862
521	669205.8290	1685420.1440	4054.47	TU/US-C513-BLDGCOR	669011.8790	1684931.6737
522	669292.6520	1685418.3920	4053.83	TU/US-C513-BLDGCOR	669098.6769	1684929.9222
523	669293.9380	1685428.2990	4053.77	TU/US-C513-BLDGCOR	669099.9625	1684939.8263
524	685879.9040	1686627.7590	4102.02	OTC-534-CASING	685681.1215	1686138.9387
525	685879.6290	1686627.7910	4101.61	OTC-534-PVC	685680.8466	1686138.9707
526	685894.0510	1686651.2940	4102.15	OTC-534-MW6-CASING	685695.2644	1686162.4669
527	685893.7240	1686651.3020	4101.74	OTC-534-MW6-PVC	685694.9375	1686162.4749
528	685866.3710	1686655.8860	4101.59	OTC-534-MW8-PVC	685667.5925	1686167.0576
529	685866.6060	1686655.6520	4102.06	OTC-534-MW8-CASING	685667.8274	1686166.8236
530	685876.1160	1686687.3140	4102.11	OTC-534-MW5-CASING	685677.3346	1686198.4764
531	685875.8760	1686687.4250	4101.81	OTC-534-MW5-PVC	685677.0947	1686198.5874
532	685834.9910	1686704.4610	4101.83	OTC-534-MW9-PVC	685636.2216	1686215.6185
533	685835.2820	1686704.5300	4102.15	OTC-534-MW9-CASING	685636.5125	1686215.6875
534	685772.4780	1686595.2240	4101.45	OTC-534-MW10-NG	685573.7267	1686106.4131
535	669081.1480	1678793.1860	4046.72	OTC-531B-SEPTANK	668887.2342	1678306.6363
536	669082.4390	1678801.3130	4046.63	OTC-531B-SEPTANK	668888.5248	1678314.7610
537	669072.3810	1678802.9790	4046.81	OTC-531B-SEPTANK	668878.4697	1678316.4265
538	669070.8860	1678795.3530	4046.82	OTC-531B-SEPTANK	668876.9751	1678308.8027
539	669104.1410	1678787.7690	4045.69	OTC-531B-STATION-1	668910.2205	1678301.2209
540	669070.9690	1678801.9800	4046.52	OTC-531B-STATION-2	668877.0581	1678315.4278
541	669061.4820	1678787.2510	4046.24	OTC-531B-STATION-3	668867.5739	1678300.7031
542	669022.2810	1678760.4940	4045.98	OTC-531B-MW-1-PVC	668828.3842	1678273.9538
543	669022.4740	1678760.4670	4046.35	OTC-531B-MW-1-CASING	668828.5772	1678273.9268
544	669029.7060	1678750.8610	4046.12	OTC-531B-LEACH	668835.8071	1678264.3236
545	669044.0770	1678753.3070	4046.04	OTC-531B-LEACH	668850.1739	1678266.7689
546	669048.2090	1678762.3910	4046.19	OTC-531B-LEACH	668854.3047	1678275.8503
547	669052.8600	1678773.5200	4046.17	OTC-531B-LEACH	668858.9544	1678286.9760
548	669051.8580	1678782.0380	4046.19	OTC-531B-LEACH	668857.9527	1678295.4916
549	669045.9680	1678791.0410	4045.97	OTC-531B-LEACH	668852.0644	1678304.4920
550	669037.6080	1678787.3270	4046.05	OTC-531B-LEACH	668843.7068	1678300.7790
551	669030.8940	1678787.9690	4046.07	OTC-531B-LEACH	668836.9947	1678301.4208
552	669024.6850	1678794.4050	4045.99	OTC-531B-LEACH	668830.7875	1678307.8550
553	669012.0060	1678808.0140	4045.98	OTC-531B-LEACH	668818.1122	1678321.4600
554	669005.0390	1678788.3970	4045.95	OTC-531B-LEACH	668811.1472	1678301.8487
555	669008.1540	1678771.5710	4046.05	OTC-531B-LEACH	668814.2613	1678285.0276
556	669012.3090	1678761.0960	4046.10	OTC-531B-LEACH	668818.4151	1678274.5556
557	669052.5660	1678784.6580	4046.08	OTC-531B-FLINE	668858.6605	1678298.1108
558	669071.4380	1678798.9230	4046.55	OTC-531B-FLINE	668877.5270	1678312.3717
559	669082.2160	1678797.7200	4046.58	OTC-531B-ELINE	668888.3019	1678311.1690
560	669109.7160	1678792.3340	4045.64	OTC-531B-ELINE	668915.7939	1678305.7846
561	669130.6340	1678787.5660	4047.05	OTC-531B-ELINE	668936.7058	1678301.0180
562	669132.6960	1678800.0880	4046.87	OTC-531B-BLDGCOR	668938.7672	1678313.5363
563	669139.6540	1678804.9540	4046.97	OTC-531B-BLDGCOR	668945.7232	1678318.4009
564	669127.3740	1678771.5760	4046.72	OTC-531B-BLDGCOR	668933.4468	1678285.0326
565	669131.8520	1678764.6150	4047.25	OTC-531B-BLDGCOR	668937.9235	1678278.0736
566	668593.1300	1678901.9680	4046.19	OTC-531C-BLDGCOR	668399.3576	1678415.3868
567	668588.1250	1678902.8360	4046.21	OTC-531C-BLDGCOR	668394.3541	1678416.2546
568	668585.3350	1678865.5840	4046.55	OTC-531C-BLDGCOR	668391.5649	1678379.0133
569	668590.1110	1678858.6070	4046.53	OTC-531C-BLDGCOR	668396.3395	1678372.0384
570	668590.3090	1678889.4560	4045.95	OTC-531C-ELINE	668396.5374	1678402.8784
571	668578.4210	1678891.4650	4046.03	OTC-531C-ELINE	668384.6529	1678404.8868
572	668560.7680	1678894.7530	4045.47	OTC-531C-ELINE	668367.0050	1678408.1739
573	668535.6480	1678899.2930	4046.35	OTC-531C-ELINE	668341.8923	1678412.7126
574	668535.0660	1678896.4960	4046.68	OTC-531C-SEPTIC	668341.3104	1678409.9164
575	668535.3940	1678905.9700	4046.47	OTC-531C-SEPTIC	668341.6383	1678419.3876
576	668522.2510	1678906.9450	4046.51	OTC-531C-SEPTIC	668328.4992	1678420.3624
577	668522.3100	1678897.4040	4046.39	OTC-531C-SEPTIC	668328.5581	1678410.8241

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
578	668561.9930	1678890.5660	4045.66	OTC-531C-STATION-1	668368.2296	1678403.9881
579	668531.2500	1678902.0810	4046.55	OTC-531C-STATION-2	668337.4955	1678415.4998
580	668522.9580	1678893.5110	4045.84	OTC-531C-STATION-3	668329.2059	1678406.9323
581	668521.6100	1678902.7660	4046.16	OTC-531C-FLINE	668327.8583	1678416.1846
582	668515.2610	1678901.5740	4045.66	OTC-531C-FLINE	668321.5112	1678414.9929
583	668515.8520	1678907.4010	4045.67	OTC-531C-LEACH	668322.1020	1678420.8182
584	668498.6960	1678906.8280	4045.81	OTC-531C-LEACH	668304.9510	1678420.2454
585	668489.9270	1678907.6430	4045.74	OTC-531C-LEACH	668296.1845	1678421.0602
586	668481.5760	1678902.8790	4045.69	OTC-531C-LEACH	668287.8359	1678416.2975
587	668476.1180	1678891.3230	4045.84	OTC-531C-LEACH	668282.3795	1678404.7449
588	668473.4290	1678883.0340	4045.68	OTC-531C-LEACH	668279.6913	1678396.4583
589	668473.7340	1678874.2510	4045.53	OTC-531C-LEACH	668279.9962	1678387.6778
590	668476.2360	1678867.2340	4045.54	OTC-531C-LEACH	668282.4975	1678380.6629
591	668482.1720	1678868.3950	4045.45	OTC-531C-MW-1-PVC	668288.4318	1678381.8235
592	668482.4510	1678868.3680	4045.85	OTC-531C-MW-1-CASING	668288.7107	1678381.7965
593	668490.9400	1678863.0190	4045.60	OTC-531C-LEACH	668297.1972	1678376.4491
594	668503.3450	1678866.8310	4045.87	OTC-531C-LEACH	668309.5986	1678380.2600
595	668508.4050	1678874.1920	4045.93	OTC-531C-LEACH	668314.6572	1678387.6189
596	668515.8970	1678879.7420	4045.82	OTC-531C-LEACH	668322.1470	1678393.1672
597	668524.3970	1678890.3500	4045.70	OTC-531C-LEACH	668330.6445	1678403.7722
598	667495.6300	1679128.7300	4042.53	OTC-532-BLDGCOR	667302.1757	1678642.0831
599	667488.6400	1679123.9580	4042.71	OTC-532-BLDGCOR	667295.1877	1678637.3125
600	667462.6660	1679059.4970	4041.10	OTC-532-BLDGCOR	667269.2212	1678572.8701
601	667481.1840	1679050.1710	4042.61	OTC-532-BLDGCOR	667287.7339	1678563.5469
602	667486.0130	1679106.7520	4042.73	OTC-532-ELINE	667292.5615	1678620.1115
603	667462.4800	1679111.5030	4040.38	OTC-532-ELINE	667269.0353	1678624.8611
604	667462.2250	1679114.4150	4040.62	OTC-532-STATION-1	667268.7804	1678627.7722
605	667442.0090	1679119.1410	4041.24	OTC-532-STATION-2	667248.5702	1678632.4969
606	667419.1640	1679115.1840	4040.86	OTC-532-STATION-3	667225.7319	1678628.5410
607	667385.6930	1679101.6040	4040.50	OTC-532-STATION-4	667192.2706	1678614.9649
608	667381.8850	1679101.5680	4040.62	OTC-532-LEACH	667188.4637	1678614.9290
609	667383.6400	1679091.6130	4040.63	OTC-532-LEACH	667190.2181	1678604.9768
610	667385.4250	1679087.0370	4040.57	OTC-532-LEACH	667192.0026	1678600.4022
611	667388.9960	1679084.4040	4040.65	OTC-532-LEACH	667195.5726	1678597.7699
612	667394.2390	1679084.6140	4040.73	OTC-532-LEACH	667200.8141	1678597.9799
613	667396.1210	1679092.7430	4040.70	OTC-532-LEACH	667202.6955	1678606.1065
614	667398.1240	1679100.9150	4040.70	OTC-532-LEACH	667204.6979	1678614.2761
615	667402.2360	1679106.9240	4040.75	OTC-532-LEACH	667208.8088	1678620.2834
616	667410.1270	1679109.8530	4040.82	OTC-532-LEACH	667216.6975	1678623.2116
617	667419.4540	1679110.1630	4040.85	OTC-532-LEACH	667226.0218	1678623.5215
618	667420.7270	1679120.1400	4041.02	OTC-532-FLINE	667227.2944	1678633.4956
619	667423.8510	1679141.7780	4040.59	OTC-532-LEACH	667230.4175	1678655.1273
620	667412.2990	1679143.4760	4040.74	OTC-532-LEACH	667218.8688	1678656.8248
621	667403.7350	1679143.1670	4040.80	OTC-532-LEACH	667210.3073	1678656.5159
622	667397.0900	1679139.6510	4040.75	OTC-532-LEACH	667203.6642	1678653.0009
623	667384.3300	1679127.9250	4040.44	OTC-532-LEACH	667190.9079	1678641.2783
624	667382.6070	1679116.1130	4040.44	OTC-532-LEACH	667189.1854	1678629.4697
625	667430.4810	1679118.6630	4041.32	OTC-532-FLINE	667237.0456	1678632.0190
626	667430.2210	1679114.2980	4041.25	OTC-532-SEPTIC	667236.7856	1678627.6553
627	667440.5880	1679113.0200	4041.26	OTC-532-SEPTIC	667247.1496	1678626.3776
628	667442.9470	1679123.3120	4041.21	OTC-532-SEPTIC	667249.5080	1678636.6667
629	667430.1210	1679125.8580	4041.28	OTC-532-SEPTIC	667236.6857	1678639.2119
630	667441.8110	1679116.2010	4041.27	OTC-532-ELINE	667248.3723	1678629.5577
631	669659.5140	1678688.1920	4048.05	OTC-531A-ELINE	669465.4326	1678201.6728
632	669645.1200	1678691.4170	4047.42	OTC-531A-ELINE	669451.0427	1678204.8968
633	669626.5240	1678694.6570	4048.54	OTC-531A-ELINE	669432.4521	1678208.1359
634	669625.4550	1678690.5680	4048.58	OTC-531A-SEPTIC	669431.3834	1678204.0481
635	669627.0130	1678697.2200	4048.59	OTC-531A-SEPTIC	669432.9410	1678210.6981
636	669614.1180	1678700.1730	4048.60	OTC-531A-SEPTIC	669420.0497	1678213.6503
637	669613.0940	1678693.8150	4048.72	OTC-531A-SEPTIC	669419.0260	1678207.2941
638	669648.5430	1678685.0250	4047.24	OTC-531A-STATION-1	669454.4647	1678198.5067
639	669615.3510	1678691.9600	4048.59	OTC-531A-STATION-2	669421.2823	1678205.4397
640	669607.0140	1678691.1700	4048.42	OTC-531A-STATION-3	669412.9478	1678204.6499
641	669606.7200	1678688.2040	4048.56	OTC-531A-LEACH	669412.6539	1678201.6848
642	669608.9270	1678706.1330	4048.28	OTC-531A-LEACH	669414.8602	1678219.6086
643	669601.3790	1678707.8980	4048.13	OTC-531A-LEACH	669407.3144	1678221.3730
644	669593.2420	1678708.2220	4047.49	OTC-531A-LEACH	669399.1798	1678221.6970
645	669578.1380	1678708.5010	4047.22	OTC-531A-LEACH	669384.0801	1678221.9759
646	669565.0490	1678706.1840	4047.29	OTC-531A-LEACH	669370.9949	1678219.6595
647	669554.2260	1678694.3690	4047.37	OTC-531A-LEACH	669360.1751	1678207.8480
648	669553.4160	1678687.6760	4047.59	OTC-531A-LEACH	669359.3653	1678201.1569

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
649	669552.5940	1678678.4030	4047.76	OTC-531A-LEACH	669358.5435	1678191.8866
650	669550.0120	1678656.4050	4047.76	OTC-531A-LEACH	669355.9623	1678169.8950
651	669556.1880	1678652.3190	4047.86	OTC-531A-LEACH	669362.1365	1678165.8102
652	669559.2580	1678655.8340	4047.38	OTC-531A-MW-1-PVC	669365.2056	1678169.3241
653	669559.5100	1678655.7600	4047.78	OTC-531A-MW-1-CASING	669365.4575	1678169.2502
654	669561.9190	1678650.8880	4047.69	OTC-531A-LEACH	669367.8658	1678164.3796
655	669569.0970	1678659.8040	4048.02	OTC-531A-LEACH	669375.0418	1678173.2930
656	669574.5390	1678669.0420	4047.77	OTC-531A-LEACH	669380.4822	1678182.5283
657	669580.0480	1678677.6210	4047.77	OTC-531A-LEACH	669385.9896	1678191.1048
658	669581.1180	1678685.2190	4047.72	OTC-531A-LEACH	669387.0593	1678198.7006
659	669589.3790	1678690.0080	4047.91	OTC-531A-LEACH	669395.3179	1678203.4882
660	669598.7410	1678687.4540	4047.88	OTC-531A-LEACH	669404.6772	1678200.9350
661	669608.6000	1678697.8630	4048.38	OTC-531A-FLINE	669414.5333	1678211.3410
662	669613.4950	1678697.0050	4048.61	OTC-531A-FLINE	669419.4269	1678210.4832
663	669434.7190	1685385.1220	4055.15	US/TC-515-EXAVATION	669240.7027	1684896.6618
664	669433.7320	1685375.0770	4054.68	US/TC-515-EXAVATION	669239.7160	1684886.6198
665	669453.6100	1685372.2880	4054.89	US/TC-515-EXAVATION	669259.5882	1684883.8316
666	669455.2490	1685382.6100	4055.08	US/TC-515-EXAVATION	669261.2268	1684894.1506
667	669423.1290	1685379.3360	4054.73	US/TC-515-POTHOLE-1	669229.1161	1684890.8775
668	669443.7270	1685362.1260	4054.20	US/TC-515-POTHOLE-2	669249.7081	1684873.6725
669	669443.2340	1685352.4030	4053.69	US/TC-515-POTHOLE-3	669249.2152	1684863.9523
670	669388.8600	1685382.9350	4054.36	US/TC-515-POTHOLE-4	669194.8570	1684894.4755
671	666075.3380	1693454.3920	4059.75	US/TC-502-TANK/EX	665882.2953	1692963.5932
672	666064.5480	1693454.6090	4059.59	US/TC-502-TANK/EX	665871.5084	1692963.8101
673	666064.5890	1693463.2320	4059.66	US/TC-502-TANK/EX	665871.5494	1692972.4306
674	666075.7420	1693463.6580	4059.85	US/TC-502-TANK/EX	665882.6992	1692972.8565
675	666070.2430	1693458.8620	4059.56	US/TC-502-STATION-1	665877.2018	1692968.0619
676	666075.3470	1693459.1030	4059.61	US/TC-502-STATION-2	665882.3043	1692968.3028
677	666070.4890	1693455.0470	4059.46	US/TC-502-STATION-3	665877.4477	1692964.2480
678	666070.2650	1693463.1340	4059.49	US/TC-502-STATION-4	665877.2238	1692972.3327
679	666072.2440	1693503.2780	4060.12	US/TC-502-FIREHY	665879.2022	1693012.4650
680	669813.9600	1693315.1950	4077.70	US/TC-503-EXAVATION	669619.8338	1692824.4365
681	669826.0790	1693326.7460	4077.45	US/TC-503-EXAVATION	669631.9493	1692835.9842
682	669815.4720	1693337.1950	4077.67	US/TC-503-EXAVATION	669621.3454	1692846.4302
683	669803.8000	1693324.4750	4077.59	US/TC-503-EXAVATION	669609.6767	1692833.7139
684	669818.2990	1693319.1730	4077.48	US/TC-503-BEGTRENCH	669624.1715	1692828.4134
685	669837.0790	1693303.2490	4076.88	US/TC-503-ENDTRENCH	669642.9461	1692812.4940
686	681138.0180	1690539.4590	4109.33	OTC-538-STATION-5	680940.6098	1690049.5050
687	673758.3950	1683356.5480	4060.55	US/TC-514-STATION-1	673563.1256	1682868.6758
688	673765.5540	1683358.1250	4060.47	US/TC-514-STATION-2	673570.2825	1682870.2523
689	673770.0890	1683350.4240	4060.48	US/TC-514-STATION-3	673574.8162	1682862.5535
690	673768.2490	1683354.2670	4060.48	US/TC-514-STATION-4	673572.9768	1682866.3954
691	673777.4280	1683353.4050	4060.71	US/TC-514-STATION-5	673582.1531	1682865.5337
692	673776.8350	1683359.0390	4060.94	US/TC-514-BLDGCOR	673581.5603	1682871.1661
693	673769.7480	1683353.9100	4060.70	US/TC-514-BLDGCOR	673574.4753	1682866.0385
694	673778.8570	1683370.4750	4060.92	US/TC-514-BLDGCOR	673583.5817	1682882.5987
695	673773.9440	1683377.3380	4060.70	US/TC-514-BLDGCOR	673578.6701	1682889.4597
696	673723.3370	1683411.0030	4060.56	US/TC-514-MW-1-PVC	673528.0778	1682923.1150
697	673723.6160	1683410.9000	4061.02	US/TC-514-MW-1-CASIN	673528.3567	1682923.0120
698	673699.2890	1683380.7720	4061.09	US/TC-514-MW-2-CASIN	673504.0367	1682892.8928
699	673698.9660	1683380.8260	4060.66	US/TC-514-MW-2-PVC	673503.7138	1682892.9467
700	673812.5550	1683317.4880	4060.43	US/TC-514-MW-3-PVC	673617.2699	1682829.6271
701	673812.8820	1683317.4350	4060.76	US/TC-514-MW-3-CASIN	673617.5968	1682829.5741
702	673776.7270	1683350.1350	4060.82	US/TC-514-FORM/TANK	673581.4523	1682862.2646
703	673777.3420	1683356.4370	4060.94	US/TC-514-FORM/TANK	673582.0671	1682868.5648
704	673759.1130	1683359.4810	4061.06	US/TC-514-FORM/TANK	673563.8434	1682871.6079
705	673757.7990	1683353.3170	4061.32	US/TC-514-FORM/TANK	673562.5298	1682865.4457
706	678061.9490	1684350.2580	4078.63	US/TC-516-FORMTANK	677865.4323	1683862.0978
707	678072.0100	1684348.4740	4078.61	US/TC-516-FORMTANK	677875.4904	1683860.3143
708	678074.0860	1684360.1530	4078.25	US/TC-516-FORMTANK	677877.5658	1683871.9899
709	678065.1290	1684362.4260	4078.47	US/TC-516-FORMTANK	677868.6114	1683874.2622
710	678069.6040	1684359.8850	4078.30	US/TC-516-STATION-1	677873.0851	1683871.7220
711	678064.5960	1684356.9350	4078.34	US/TC-516-STATION-2	677868.0786	1683868.7728
712	678066.1670	1684350.4200	4078.54	US/TC-516-STATION-3	677869.6491	1683862.2597
713	678072.9250	1684354.8490	4078.09	US/TC-516-STATION-4	677876.4052	1683866.6874
714	678101.7280	1684311.2380	4077.72	US/TC-516-MW-2	677905.1998	1683823.0891
715	678116.9250	1684291.3650	4077.78	US/TC-516-MW-2	677920.3924	1683803.2218
716	678061.7680	1684335.2520	4080.38	US/TC-516-BLDGCOR	677865.2514	1683847.0961
717	678064.6310	1684348.2080	4081.07	US/TC-516-BLDGCOR	677868.1136	1683860.0484
718	678026.7560	1684390.7900	4078.49	US/TC-516-MW-1	677830.2495	1683902.6180
719	678014.0050	1684363.8290	4077.81	US/TC-516-MW-3	677817.5022	1683875.6648

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
720	671269.9880	1692357.3370	4075.08	US/TC-508-FORM/TANK	671075.4398	1691866.8562
721	671299.4450	1692330.8640	4075.18	US/TC-508-FORM/TANK	671104.8883	1691840.3908
722	671324.3300	1692358.5130	4075.17	US/TC-508-FORM/TANK	671129.7661	1691868.0318
723	671294.8560	1692384.8580	4075.02	US/TC-508-FORM/TANK	671100.3006	1691894.3692
724	671311.5950	1692346.0080	4075.12	US/TC-508-STATION-2	671117.0347	1691855.5304
725	671302.2680	1692357.1830	4075.07	US/TC-508-STATION-1	671107.7104	1691866.7022
726	671312.4640	1692368.2800	4074.98	US/TC-508-STATION-4	671117.9035	1691877.7960
727	671282.5110	1692369.9060	4075.01	US/TC-508-STATION-3	671087.9592	1691879.4215
728	671289.2400	1692342.4620	4075.15	US/TC-508-STATION-5	671094.6862	1691851.9855
729	671373.3210	1692386.6060	4075.00	US/TC-508-MW-3-PVC	671178.7429	1691896.1167
730	671373.6120	1692386.5000	4075.33	US/TC-508-MW-3-CASIN	671179.0338	1691896.0107
731	671216.9160	1692488.1670	4075.54	US/TC-508-SS18-MW08-CASIN	671022.3832	1691997.6482
732	671216.7110	1692488.4340	4075.26	US/TC-508-SS18-MW08-PVC	671022.1782	1691997.9152
733	671236.3110	1692301.9320	4075.19	US/TC-508-MW-2-CASIN	671041.7726	1691811.4672
734	671236.1240	1692302.1450	4074.80	US/TC-508-MW-2-PVC	671041.5856	1691811.6801
735	671211.3090	1692324.4610	4075.35	US/TC-508-MW-1-CASIN	671016.7778	1691833.9897
736	671211.0360	1692324.6620	4074.93	US/TC-508-MW-1-PVC	671016.5049	1691834.1906
737	671174.1880	1692241.9700	4074.81	US/TC-508-SS18-MW16-PVC	670979.6676	1691751.5226
738	671174.4770	1692241.7880	4075.34	US/TC-508-SS18-MW16-CASIN	670979.9565	1691751.3406
739	671035.8870	1692106.1030	4074.42	US/TC-508-SS18-MW18-CASIN	670841.4066	1691615.6950
740	671035.6230	1692106.3690	4073.74	US/TC-508-SS18-MW18-PVC	670841.1427	1691615.9609
741	671043.1730	1692355.2630	4075.73	US/TC-508-SS18-MW19-PVC	670848.6905	1691864.7828
742	670383.2120	1691278.5670	4072.57	US/TC-504-MW-2-CASIN	670188.9208	1690788.3988
743	670383.0220	1691278.7790	4072.19	US/TC-504-MW-2-PVC	670188.7309	1690788.6107
744	670343.7050	1691297.2270	4072.57	US/TC-504-MW-1-PVC	670149.4253	1690807.0534
745	670343.9460	1691296.8630	4072.80	US/TC-504-MW-1-CASIN	670149.6662	1690806.6895
746	669680.3630	1678704.0610	4048.54	OTC-531A-BLDGCOR	669486.2755	1678217.5372
747	669673.4280	1678699.1340	4048.44	OTC-531A-BLDGCOR	669479.3425	1678212.6116
748	669662.1160	1678671.3190	4048.32	OTC-531A-BLDGCOR	669468.0338	1678184.8047
749	669671.0810	1678657.6480	4048.29	OTC-531A-BLDGCOR	669476.9962	1678171.1376
750	669671.6690	1678686.6260	4048.54	OTC-531A-ELINE	669477.5840	1678200.1072
751	670995.2900	1691723.6540	4072.55	US/TC-500-STATION-6	670800.8214	1691233.3568
752	682707.7150	1693994.3080	4139.12	OTC-539-SEPTIC	682509.8519	1693503.3527
753	682707.1360	1693987.5070	4139.01	OTC-539-SEPTIC	682509.2731	1693496.5537
754	682713.9270	1693987.3840	4139.07	OTC-539-SEPTIC	682516.0621	1693496.4307
755	682714.4020	1693993.8490	4139.12	OTC-539-SEPTIC	682516.5370	1693502.8939
756	682710.5050	1693994.2530	4139.11	OTC-539-ELINE	682512.6411	1693503.2977
757	682711.7750	1694038.3560	4139.83	OTC-539-ELINE	682513.9107	1693547.3880
758	682709.6340	1694009.1330	4139.38	OTC-539-STATION-1	682511.7704	1693518.1734
759	682715.9010	1693990.7160	4139.12	OTC-539-STATION-2	682518.0355	1693499.7618
760	682707.9950	1693985.7400	4139.05	OTC-539-STATION-3	682510.1318	1693494.7872
761	682690.1540	1693966.7430	4138.58	OTC-539-STATION-4	682492.2960	1693475.7957
762	682700.5510	1693984.6270	4139.10	OTC-539-LEACH	682502.6900	1693493.6745
763	682694.7220	1693978.9800	4138.75	OTC-539-LEACH	682496.8627	1693488.0292
764	682685.8570	1693975.5370	4138.62	OTC-539-LEACH	682488.0002	1693484.5872
765	682686.8260	1693963.6500	4138.56	OTC-539-LEACH	682488.9690	1693472.7036
766	682690.9260	1693959.9730	4138.78	OTC-539-LEACH	682493.0678	1693469.0277
767	682696.9840	1693956.9410	4138.94	OTC-539-LEACH	682499.1240	1693465.9966
768	682705.4410	1693958.5980	4139.12	OTC-539-LEACH	682507.5786	1693467.6531
769	682714.7430	1693968.3290	4139.32	OTC-539-LEACH	682516.8779	1693477.3813
770	682721.4010	1693976.8710	4139.30	OTC-539-LEACH	682523.5339	1693485.9208
771	682717.7930	1693983.8070	4139.35	OTC-539-LEACH	682519.9270	1693492.8548
772	682710.1830	1693984.5790	4139.16	OTC-539-FLINE	682512.3192	1693493.6265
773	682710.2190	1693987.2160	4139.18	OTC-539-FLINE	682512.3552	1693496.2628
774	682690.6020	1694039.4720	4139.43	OTC-539-BLDGCOR	682492.7439	1693548.5036
775	682684.8200	1694045.5030	4139.27	OTC-539-BLDGCOR	682486.9635	1693554.5329
776	682741.4000	1694039.0240	4140.22	OTC-539-BLDGCOR	682543.5271	1693548.0558
777	682747.1830	1694045.0970	4140.68	OTC-539-BLDGCOR	682549.3085	1693554.1270

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7824
PROFESSIONAL SURVEYOR

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
778	686068.4560	1686694.7280	4103.68	OTC-534-MW-10-PVC	685869.6189	1686205.8883
779	686068.7800	1686694.7810	4104.06	OTC-534-MW-10-CASING	685869.9428	1686205.9413
780	685846.6180	1686522.2590	4102.52	OTC-534-MW-11-CASING	685647.8452	1686033.4693
781	685846.3620	1686522.2240	4102.15	OTC-534-MW-11-PVC	685647.5893	1686033.4343
782	685670.3280	1686561.9490	4102.29	OTC-534-MW-12-PVC	685471.6063	1686073.1478
783	685670.6410	1686561.9860	4102.69	OTC-534-MW-12-CASING	685471.9192	1686073.1848

RAW DATA

HOLLOMAN AIR FORCE BASE
WEST SITE

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	684793.2210	1611172.5300	3911.93	BASE	684598.9178	1610715.3759
2	682531.9480	1628747.6200	3965.57	EC-30	682338.2864	1628285.4792
3	682452.1330	1628714.0920	3957.20	EC-30-2	682258.4940	1628251.9607
4	698323.2620	1606321.3780	3915.08	CHAS	698125.1198	1605865.6004
5	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
60	616427.1730	1576921.6540	3941.67	LUCERO	616252.2680	1576474.2182
61	600657.7750	1576446.9260	4131.58	GERI	600487.3444	1575999.6249
62	614156.5210	1568701.1170	4227.09	SW 30	613982.2602	1568256.0137
63	575518.1130	1586543.7100	4038.20	BRYCE AZ MK	575354.8155	1586093.5441
64	576512.9440	1582067.6800	4357.70	BRYCE	576349.3642	1581618.7841
65	633185.2600	1566510.7280	4417.64	HORN	633005.6000	1566066.2462
66	580320.9040	1585783.2080	4128.59	NICK 2	580156.2437	1585333.2579
67	682452.1790	1628714.1810	3957.10	EC-30-2	682258.5400	1628252.0496
68	698323.2620	1606321.3780	3914.70	CHAS	698125.1198	1605865.6004
69	698212.0050	1609477.2870	3928.40	CHUCK	698013.8943	1609020.6139
70	682531.9020	1628747.5310	3965.57	EC-30	682338.2404	1628285.3902
71	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
100	684194.1900	1611160.8710	3912.56	USTC-518-NG	684000.0567	1610703.7202
101	684194.8810	1611165.7430	3912.33	USTC-518-NG	684000.7475	1610708.5908
102	684188.7970	1611168.5190	3912.27	USTC-518-NG	683994.6653	1610711.3660
103	684189.4230	1611176.5450	3912.53	USTC-518-NG	683995.2911	1610719.3898
104	684179.6480	1611178.5150	3912.57	USTC-518-NG	683985.5189	1610721.3592
105	684178.1630	1611171.1680	3912.37	USTC-518-NG	683984.0343	1610714.0143
106	684177.1790	1611163.0630	3913.00	USTC-518-NG	683983.0506	1610705.9116
107	684157.6940	1611173.6700	3912.42	USTC-518-STATION-5	683963.5711	1610716.5156
108	684176.2170	1611179.5100	3912.28	USTC-518-STATION-4	683982.0888	1610722.3539
109	684175.8730	1611172.3430	3912.51	USTC-518-STATION-2	683981.7449	1610715.1890
110	684173.8830	1611163.3430	3912.65	USTC-518-STATION-3	683979.7555	1610706.1915
111	684189.5770	1611170.0220	3912.30	USTC-518-STATION-1	683995.4450	1610712.8686
112	684160.3220	1611172.8640	3912.49	USTC-518-POTHOLE-1	683966.1984	1610715.7098
113	684125.1520	1611185.2360	3910.93	USTC-518-MW-1	683931.0383	1610728.0783
114	684130.9190	1611216.0540	3911.17	USTC-518-MW-2	683936.8037	1610758.8876
115	684158.8770	1611187.1610	3912.34	USTC-518-BLDGCORN-70	683964.7538	1610730.0028
116	684163.9700	1611180.4420	3912.46	USTC-518-BLDGCORN-70	683969.8453	1610723.2857
117	684211.6690	1611174.1790	3912.47	USTC-518-BLDGCORN-70	684017.5308	1610717.0244
118	684218.3800	1611179.3060	3912.45	USTC-518-BLDGCORN-70	684024.2399	1610722.1500
119	684236.0190	1611144.8000	3911.88	USTC-518-NAIL	684041.8739	1610687.6538
120	684242.7800	1611133.9130	3911.77	USTC-518-NAIL	684048.6330	1610676.7699
121	684203.7200	1611162.6570	3912.21	USTC-518-STATION-6	684009.5840	1610705.5057

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7924
PROFESSIONAL SURVEYOR

Appendix G
Laboratory Analytical Data and Data Validation Reports

Note: The data validation checklists and laboratory analytical data reports are provided as separate files.

Appendix H
Waste Manifests

HAFB-001

Generator's Name	Generator's Address	Generator's Telephone No.
USAF	550 TABOSA AVE Holloman AFB NM 88330	575-491-8262

Origin of Special Waste (Project or Spill Location): ~~White Sands National Monument Park - Storage Lagoons~~ Holloman AFB NM Bldg # 55

Transporter #1 Company Name	Address	Telephone No.
Southwest Disposal	1350 LaVelle Road	575-434-1109
Transporter #2 Company Name	Address	Telephone No.
	Alamogordo, NM 88310	
Destination Facility Name/Site Address	Facility ID (Permit) Number	Telephone No.
Otero/Greentree Regional Landfill 24 Mls South of Alamogordo, Hwy 54	SWM-109102	575-439-4355

Type and Proper Name of Special Waste	Container(s) No.	Container(s) Type	Total Quantity	Unit Wt/Vol	
Non RCRA/Non Hazardous Substance ~~(Treatment Plant Lagoon Sludge)~~ (soil)		SD		6.95	Tons

Additional Descriptions for Special Waste Listed Above:

Site Contact: Todd Hiltunen 307-214-6080

Special Handling Instructions:

Southwest Disposal - Lined and Covered Roll-off

GENERATOR'S CERTIFICATION I hereby certify that the contents of this shipment are fully and accurately described above by type and proper name of the special waste, and that such waste has been managed, packaged, containerized and labeled in accordance with the requirements of 20.9.8 NMAC (Special Waste Requirements) in addition to any other applicable federal, state or local regulations.

Truck # 553 Bin #

Printed/Typed Name:	Signature:	Date:
Todd Hiltunen for Brent Hunt (CES)	for Brent Hunt (CES)	9/25/12

Transporter 1 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:
David Gurnbach		9/26/12

Transporter 2 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:

Discrepancy Indication Space:

Analytical supplied to landfill

no facility ID number

Facility Owner or Operator: ***I hereby acknowledge receipt of the special waste as indicated upon this manifest, except as noted above in the Discrepancy Indication Space.***

Printed/Typed Name:	Signature:	Date:
Darrell McGinnis / Attendant		9-26-12

~~Facility~~

OTERO/GREENTREE
REGIONAL LANDFILL

TRANSACTION: 28,080

CO. NAME:

ADDRESS: Environmental Waste Solutions
1348 B. Redtail Hawk Drive

CITY & STATE: Boardman, OH 44512

DATE: 9/26/12 TIME: 9:07 am

TRUCK NO.: 198

GROSS WEIGHT 47000

TARE WEIGHT: 33100

NET TONS: 13900 6.95

COST $: [redacted]

5% TAX $:

TOTAL DUE $:

WASTE: 5

WASTE DESC.: Construction Debris
H.A.F.B.

WASTE ORIGIN:

DRIVER

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WER-09-13-067

Appendix I
Risk Evaluation Calculations

Risk Addtivity
Soil Analytical Data
Building 924 (OT-C532) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC532-IS-0001-071612		OTC532-IS-0002-071612		OTC532-IS-0003-071612		OTC532-IS-0004-071612		OTC532-IS-0005-071612-FD		OTC532-IS-0006-071612		OTC532-IS-0007-071612		OTC532-IS-0008-071612		OTC532-IS-0009-071612		OTC532-IS-0010-071612		OTC532-IS-0011-071612	
			Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
			Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		9 - 11	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE	**74.5**		**75.9**		**80.9**		**78.6**		**79**		**77.3**		**77.9**		**77.8**		**75.7**		**82.1**		**75.6**	
VOLATILES (mg/kg)																									
1,1,1-TRICHLOROETHANE	NE	8700	15600	0.0012	U	0.00093	U	0.0015	U	0.0015	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00096	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02	0.0013	U	0.001	U	0.0016	U	0.0017	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.001	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100	0.0018	U	0.0014	U	0.0023	U	0.0024	U	0.0016	U	0.0018	U	0.0017	U	0.0018	U	0.0017	U	0.0017	U	0.0015	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81	0.0012	U	0.00093	U	0.0015	U	0.0015	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00096	U
1,1-DICHLOROETHANE	NE	3.3	64.5	0.0012	U	0.00093	U	0.0015	U	0.0015	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00096	U
1,1-DICHLOROETHENE	NE	240	449	0.0015	U	0.0012	U	0.0019	U	0.002	U	0.0013	U	0.0015	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0012	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0	0.0013	U	0.001	U	0.0016	U	0.0017	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.001	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86	0.0025	U	0.002	U	0.0031	U	0.0032	U	0.0021	U	0.0025	U	0.0023	U	0.0025	U	0.0024	U	0.0023	U	0.002	U
1,2-DIBROMOETHANE	NE	0.034	0.588	0.0011	U	0.00085	U	0.0013	U	0.0014	U	0.00091	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.00087	U
1,2-DICHLOROBENZENE	NE	1900	2310	0.0012	U	0.00093	U	0.0015	U	0.0015	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00096	U
1,2-DICHLOROETHANE	NE	0.43	7.89	0.0011	U	0.00085	U	0.0013	U	0.0014	U	0.00091	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.00087	U
1,2-DICHLOROPROPANE	NE	0.94	15.2	0.0013	U	0.001	U	0.0016	U	0.0017	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.001	U
1,3-DICHLOROBENZENE	NE	NE	NE	0.0013	U	0.001	U	0.0016	U	0.0017	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.001	U
1,4-DICHLOROBENZENE	NE	2.4	31.7	0.0012	U	0.00093	U	0.0015	U	0.0015	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00096	U
2-HEXANONE	NE	210	NE	0.0058	U	0.0046	U	0.0072	U	0.0076	U	0.0049	U	0.0058	U	0.0055	U	0.0058	U	0.0056	U	0.0055	U	0.0047	U
ACETONE	NE	61000	66600	0.021	U	0.017	U	0.027	U	0.028	U	0.018	U	0.022	U	0.02	U	0.022	U	0.021	U	0.02	U	**0.0181**	J
BENZENE	NE	1.1	15.4	0.0016	U	0.0013	U	0.002	U	0.0021	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U
BROMODICHLOROMETHANE	NE	0.27	5.41	0.0012	U	0.00093	U	0.0015	U	0.0015	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00096	U
BROMOFORM	NE	62	616	0.0016	U	0.0013	U	0.002	U	0.0021	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U
BROMOMETHANE	NE	7.3	16.5	0.0021	U	0.0017	U	0.0027	U	0.0028	U	0.0018	U	0.0022	U	0.002	U	0.0022	U	0.0021	U	0.002	U	0.0017	U
CARBON DISULFIDE	NE	820	1530	0.0021	U	0.0017	U	0.0027	U	0.0028	U	0.0018	U	0.0022	U	0.002	U	0.0022	U	0.0021	U	0.002	U	0.0017	U
CARBON TETRACHLORIDE	NE	0.61	10.8	0.0019	U	0.0015	U	0.0024	U	0.0025	U	0.0016	U	0.0019	U	0.0018	U	0.0019	U	0.0019	U	0.0018	U	0.0016	U
CHLOROBENZENE	NE	290	376	0.0011	U	0.00085	U	0.0013	U	0.0014	U	0.00091	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.00087	U
CHLOROETHANE	NE	15000	29800	0.0021	U	0.0017	U	0.0027	U	0.0028	U	0.0018	U	0.0022	U	0.002	U	0.0022	U	0.0021	U	0.002	U	0.0017	U
CHLOROFORM	NE	0.29	5.86	0.0013	U	0.001	U	0.0016	U	0.0017	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.001	U
CHLOROMETHANE	NE	120	275	0.0021	U	0.0017	U	0.0027	U	0.0028	U	0.0018	U	0.0022	U	0.002	U	0.0022	U	0.0021	U	0.002	U	0.0017	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156	0.0016	U	0.0013	U	0.002	U	0.0021	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	0.0011	U	0.00085	U	0.0013	U	0.0014	U	0.00091	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.00087	U
CYCLOHEXANE	NE	7000	NE	0.0015	U	0.0012	U	0.0019	U	0.002	U	0.0013	U	0.0015	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0012	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1	0.0011	U	0.00085	U	0.0013	U	0.0014	U	0.00091	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.00087	U
DICHLORODIFLUOROMETHANE	NE	94	168	0.0016	U	0.0013	U	0.002	U	0.0021	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U
ETHYLBENZENE	NE	5.4	68.4	0.0011	U	0.00085	U	0.0013	U	0.0014	U	0.00091	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.00087	U
ISOPROPYLBENZENE	NE	2100	2430	0.0012	U	0.00093	U	0.0015	U	0.0015	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00096	U
METHYL ACETATE	NE	78000	78200	0.013	U	0.011	U	0.017	U	0.018	U	0.011	U	0.013	U	0.013	U	0.013	U	0.013	U	0.013	U	0.011	U
METHYL ETHYL KETONE	NE	28000	37100	0.0065	U	0.0052	U	0.0081	U	0.0085	U	0.0056	U	0.0066	U	0.0062	U	0.0066	U	0.0063	U	0.0062	U	0.0053	U
METHYL ISOBUTYL KETONE	NE	5300	5820	0.0059	U	0.0047	U	0.0073	U	0.0077	U	0.005	U	0.0059	U	0.0056	U	0.0059	U	0.0057	U	0.0056	U	0.0048	U
METHYLCYCLOHEXANE	NE	5630	5630	0.0014	U	0.0011	UJ	0.0017	U	0.0018	U	0.0012	U	0.0014	U	0.0013	U	0.0014	U	0.0013	U	0.0013	U	0.0011	U
METHYLENE CHLORIDE	NE	56	409	0.0049	U	0.0039	U	0.0061	U	0.0064	U	0.0042	U	0.005	U	0.0047	U	0.005	U	0.0047	U	0.0047	U	0.004	U

Risk Addtivity
Soil Analytical Data
Building 924 (OT-C532) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC532-IS-0001-071612		OTC532-IS-0002-071612		OTC532-IS-0003-071612		OTC532-IS-0004-071612		OTC532-IS-0005-071612-FD		OTC532-IS-0006-071612		OTC532-IS-0007-071612		OTC532-IS-0008-071612		OTC532-IS-0009-071612		OTC532-IS-0010-071612		OTC532-IS-0011-071612	
				Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		9 - 11	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																										
STYRENE	NE	6300	7280		0.0028	U	0.0022	U	0.0035	U	0.0036	U	0.0024	U	0.0028	U	0.0026	U	0.0028	U	0.0027	U	0.0027	U	0.0023	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0021	U	0.0017	U	0.0027	U	0.0028	U	0.0018	U	0.0022	U	0.002	U	0.0022	U	0.0021	U	0.002	U	0.0017	U
TETRACHLOROETHYLENE	NE	22	7.02		0.0011	U	0.00085	U	0.0013	U	0.0014	U	0.00091	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.00087	U
TOLUENE	NE	5000	5270		0.0013	U	0.001	U	0.0016	U	0.0017	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.001	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0016	U	0.0013	U	0.002	U	0.0021	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0012	U	0.00093	U	0.0015	U	0.0015	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00096	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0013	U	0.001	U	0.0016	U	0.0017	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.001	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0021	U	0.0017	U	0.0027	U	0.0028	U	0.0018	U	0.0022	U	0.002	U	0.0022	U	0.0021	U	0.002	U	0.0017	U
VINYL CHLORIDE	NE	0.06	0.728		0.0016	U	0.0013	U	0.002	U	0.0021	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U
XYLENES, TOTAL	NE	630	814		0.0034	U	0.0027	U	0.0043	U	0.0045	U	0.0029	U	0.0034	U	0.0033	U	0.0035	U	0.0033	U	0.0033	U	0.0028	U
SEMIVOLATILES (mg/kg)																										
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
2,4-DICHLOROPHENOL	NE	180	183		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.028	U	0.027	U	0.026	U	0.026	U	0.026	U	0.027	U	0.027	U	0.027	U	0.027	U	0.025	U	0.027	U
2,4-DINITROPHENOL	NE	120	122		0.45	U	0.44	U	0.41	U	0.42	U	0.42	U	0.43	U	0.42	U	0.43	U	0.44	U	0.4	U	0.44	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
2,6-DINITROTOLUENE	NE	61	61.1		0.026	U	0.026	U	0.024	U	0.025	U	0.025	U	0.025	U	0.025	U	0.025	U	0.026	U	0.024	U	0.026	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
2-CHLOROPHENOL	NE	390	391		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
2-METHYLNAPHTHALENE	NE	230	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
2-METHYLPHENOL	NE	3100	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
2-NITROANILINE	NE	610	NE		0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
2-NITROPHENOL	NE	NE	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
3-NITROANILINE	NE	NE	NE		0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.089	U	0.087	U	0.082	U	0.083	U	0.084	U	0.086	U	0.084	U	0.086	U	0.087	U	0.081	U	0.087	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
4-CHLOROANILINE	NE	2.4	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
4-NITROANILINE	NE	24	NE		0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
4-NITROPHENOL	NE	NE	NE		0.18	U	0.17	U	0.16	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.17	U	0.16	U	0.17	U
ACENAPHTHENE	NE	3400	3440		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
ACENAPHTHYLENE	NE	NE	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
ACETOPHENONE	NE	7800	7820		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
ANTHRACENE	NE	17000	17200		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
ATRAZINE	NE	2.1	NE		0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U

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Analyte			Sample Number	OTC532-IS-0001-071612		OTC532-IS-0002-071612		OTC532-IS-0003-071612		OTC532-IS-0004-071612		OTC532-IS-0005-071612-FD		OTC532-IS-0006-071612		OTC532-IS-0007-071612		OTC532-IS-0008-071612		OTC532-IS-0009-071612		OTC532-IS-0010-071612		OTC532-IS-0011-071612	
			Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
			Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		9 - 11	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																									
BENZALDEHYDE	NE	7800	NE	0.22	U	0.22	U	0.2	U	0.21	U	0.21	U	0.21	U	0.21	U	0.21	U	0.22	U	0.2	U	0.22	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
BENZO(A)PYRENE	NE	0.015	0.148	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
BIPHENYL	NE	51	57.1	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.089	U	0.087	U	0.082	U	0.083	U	0.084	U	**0.55**		0.084	U	0.086	U	0.087	U	0.081	U	0.087	U
CAPROLACTAM	NE	31000	NE	0.071	U	0.07	U	0.065	U	0.067	U	0.067	U	0.069	U	0.067	U	0.069	U	0.07	U	0.065	U	0.07	U
CARBAZOLE	NE	NE	NE	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
CHRYSENE	NE	15	148	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
DIBENZOFURAN	NE	78	NE	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
DIETHYL PHTHALATE	NE	49000	48900	0.089	U	0.087	U	0.082	U	0.083	U	0.084	U	0.086	U	0.084	U	0.086	U	0.087	U	0.081	U	0.087	U
DIMETHYL PHTHALATE	NE	611000	611000	0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.089	U	0.087	U	0.082	U	0.083	U	0.084	U	0.086	U	0.084	U	0.086	U	0.087	U	0.081	U	0.087	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
FLUORANTHENE	NE	2300	2290	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
FLUORENE	NE	2300	2290	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.098	U	0.096	U	0.09	U	0.092	U	0.093	U	0.094	U	0.093	U	0.094	U	0.096	U	0.089	U	0.096	U
HEXACHLOROETHANE	NE	12	42.8	0.045	U	0.044	U	0.041	U	0.042	U	0.042	U	0.043	U	0.042	U	0.043	U	0.044	U	0.04	U	0.044	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
ISOPHORONE	NE	510	5120	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
M,P-CRESOL	NE	NE	NE	0.032	U	0.031	U	0.029	U	0.03	U	0.03	U	0.031	U	0.03	U	0.031	U	0.031	U	0.029	U	0.031	U
NAPHTHALENE	NE	3.6	43.0	0.036	U	0.035	U	0.033	U	0.033	U	0.034	U	0.034	U	0.034	U	0.034	U	0.035	U	0.032	U	0.035	U
NITROBENZENE	NE	4.8	53.5	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.27	U	0.26	U	0.24	U	0.25	U	0.25	U	0.26	U	0.25	U	0.26	U	0.26	U	0.24	U	0.26	U
PHENANTHRENE	NE	1830	1830	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
PHENOL	NE	18000	18300	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U
PYRENE	NE	1700	1720	0.022	U	0.022	U	0.02	U	0.021	U	0.021	U	0.021	U	0.021	U	0.021	U	0.022	U	0.02	U	0.022	U

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Analyte			Sample Number	OTC532-IS-0001-071612		OTC532-IS-0002-071612		OTC532-IS-0003-071612		OTC532-IS-0004-071612		OTC532-IS-0005-071612-FD		OTC532-IS-0006-071612		OTC532-IS-0007-071612		OTC532-IS-0008-071612		OTC532-IS-0009-071612		OTC532-IS-0010-071612		OTC532-IS-0011-071612	
			Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
			Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		9 - 11	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																									
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
1,3-DINITROBENZENE	NE	6.10	NE	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
2,4-DINITROTOLUENE	NE	1.60	15.7	0.074	U	0.074	U	0.082	U	0.079	U	0.072	U	0.091	U	0.075	U	0.083	U	0.082	U	0.094	U	0.088	U
2,6-DINITROTOLUENE	NE	61.0	61.1	0.066	U	0.067	U	0.074	U	0.07	U	0.064	U	0.082	U	0.067	U	0.075	U	0.073	U	0.084	U	0.079	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
2-NITROTOLUENE	NE	2.90	29.1	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
3-NITROTOLUENE	NE	6.10	7.82	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
4-NITROTOLUENE	NE	30.0	244.4	0.077	U	0.077	U	0.086	U	0.082	U	0.075	U	0.095	U	0.078	U	0.087	U	0.085	U	0.098	U	0.091	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
NITROBENZENE	NE	4.80	53.5	0.071	U	0.071	U	0.079	U	0.075	U	0.069	U	0.087	U	0.072	U	0.08	U	0.078	U	0.09	U	0.084	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
TETRYL	NE	240.0	244.0	0.061	U	0.061	U	0.068	U	0.065	U	0.059	U	0.075	U	0.062	U	0.069	U	0.067	U	0.077	U	0.072	U
METALS (mg/kg)																									
ALUMINUM	13722	77000	78000	**1300**		**7050**		**3270**		**8550**	J	**3000**	J	**3330**		**3300**		**688**		**1450**		**9980**		**1610**	
ANTIMONY	1.6	31	31.3	1.2	UJ	1.2	U	1.1	U	1.1	U	1.6	U	1.1	U	1.2	U	2.5	U	0.96	U	1.1	U	1	U
ARSENIC	3.7	0.39	3.90	1.2	U	1.2	U	1.1	U	**1.2**	J	0.81	U	1.1	U	1.2	U	1.3	U	**1.3**	J	**3**	J	1	U
BARIUM	169	15000	15600	**19.5**	J	**69.9**	J	**32.5**	J	**57.9**	J	**57.2**	J	**37.9**	J	**34.8**	J	**20**	J	**18.6**	J	**69.6**	J	**18.3**	J
BERYLLIUM	1.6	160	156	0.62	U	0.62	U	0.53	U	0.55	U	0.4	U	0.55	U	0.58	U	0.64	U	0.48	U	0.55	U	0.5	U
CADMIUM	0.3	70	70.3	0.62	UJ	0.62	U	0.53	U	0.55	U	0.81	U	0.55	U	0.58	U	1.3	U	0.48	U	0.55	U	0.5	U
CALCIUM	317332	NE	NE	**279000**		**219000**		**206000**		**175000**		**194000**		**274000**		**180000**		**272000**		**258000**		**196000**		**249000**	
CHROMIUM[d]	25	117000	117000	**0.88**	J	**7.3**		**2.9**	J	**8.6**	J	**3.1**	J	**2.5**	J	**3.5**	J	1.3	U	**1.2**	J	**8.7**		**1.3**	J
COBALT	7.7	23	NE	**0.7**	J	**2.3**	J	**1**	J	**5.1**	J	**1.3**	J	**1.3**	J	**1.5**	J	**0.66**	J	**0.8**	J	**3.3**	J	**0.58**	J
COPPER	13	3100	3130	**2.2**	J	**3**	J	**2.3**	J	**4.1**	J	**1.4**	J	**2.7**	J	**1.6**	J	**1.7**	J	**1.3**	J	**8.4**	J	**1.4**	J
IRON	23049	55000	54800	**994**		**6260**		**2750**		**8130**	J	**2980**	J	**2500**		**4570**		**480**		**2930**		**10200**		**1760**	
LEAD	10.9	400	400	0.62	U	**3**	J	**1.8**	J	**4.3**	J	0.81	U	**1.3**	J	**1.7**	J	1.3	U	0.48	U	**6.3**	J	**0.65**	J
MAGNESIUM	16991	NE	NE	**1930**	J	**8090**		**2420**	J	**5150**	J	**2460**	J	**5130**		**2920**		**4240**		**1090**	J	**11500**		**1250**	J
MANGANESE	393	1800	1860	**24.8**		**167**		**67.4**		**269**	J	**70.4**	J	**50.5**		**65.4**		**10.6**		**178**		**209**		**27.4**	
MERCURY	0.0108	10	15.6	0.01	U	0.0098	U	0.0097	U	0.01	U	0.0096	U	0.01	U	0.0094	U	0.0096	U	0.01	U	0.0097	U	0.0099	U
NICKEL	17.4	1500	1560	**1.2**	J	**5.6**	J	**2.4**	J	**8.1**	J	**2.6**	J	**2.4**	J	**3**	J	**1.1**	J	**2.2**	J	**8.4**	J	**1.1**	J
POTASSIUM	5077	NE	NE	**460**	J	**1770**	J	**953**	J	**2470**	J	**811**	J	**1070**	J	**914**	J	**398**	J	**448**	J	**3110**	J	**443**	J
SELENIUM	1.4	390	391	2.5	U	2.5	U	2.1	U	2.2	U	3.2	U	2.2	U	2.3	U	5.1	U	1.9	U	2.2	U	2	U
SILVER	1.1	390	391	0.62	U	0.62	U	0.53	U	0.55	U	0.4	U	0.55	U	0.58	U	0.64	U	0.48	U	0.55	U	0.5	U
SODIUM	5196	NE	NE	680	U	680	U	580	U	**934**	J	**601**	J	**1280**	J	640	U	**1970**	J	**649**	J	**3250**	J	**889**	J
THALLIUM	1.3	0.78	0.782	1.6	U	1.6	U	1.4	U	1.4	U	2.1	U	1.4	U	1.5	U	3.3	U	1.3	U	1.4	U	1.3	U
VANADIUM	42.6	390	391	**3.2**	J	**13.9**	J	**7.5**	J	**18.8**	J	**6.3**	J	**9.2**	J	**6.7**	J	2.9	J	**7.5**	J	**15.3**	J	**3.1**	J
ZINC	54.6	23000	23500	**3.2**	J	**15.3**		**13.3**		**19.3**	J	**6**	J	**8.6**	J	**8.5**	J	6.4	U	**3.2**	J	**29.2**		**4.3**	J

Risk Addtivity
Soil Analytical Data
Building 924 (OT-C532) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC532-IS-0001-071612		OTC532-IS-0002-071612		OTC532-IS-0003-071612		OTC532-IS-0004-071612		OTC532-IS-0005-071612-FD		OTC532-IS-0006-071612		OTC532-IS-0007-071612		OTC532-IS-0008-071612		OTC532-IS-0009-071612		OTC532-IS-0010-071612		OTC532-IS-0011-071612	
				Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		9 - 11	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																										
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93		0.0089	U	0.0087	U	0.0082	U	0.0083	U	0.0084	U	0.0086	U	0.0084	U	0.0085	U	0.0087	U	0.0081	U	0.0088	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49		0.011	U	0.011	U	0.01	U	0.01	U	0.01	U	0.011	U	0.011	U	0.011	U	0.011	U	0.01	U	0.011	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49		0.011	U	0.011	U	0.01	U	0.01	U	0.01	U	0.011	U	0.011	U	0.011	U	0.011	U	0.01	U	0.011	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22		0.0089	U	0.0087	U	0.0082	U	0.0083	U	0.0084	U	0.0086	U	0.0084	U	0.0085	U	0.0087	U	0.0081	U	0.0088	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22		0.0089	U	0.0087	U	0.0082	U	0.0083	U	0.0084	U	0.0086	U	0.0084	U	0.0085	U	0.0087	U	0.0081	U	0.0088	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12		0.0089	U	0.0087	U	0.0082	U	0.0083	U	0.0084	U	0.0086	U	0.0084	U	0.0085	U	0.0087	U	0.0081	U	0.0088	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22		0.0089	U	0.0087	U	0.0082	U	0.0083	U	0.0084	U	0.0086	U	0.0084	U	0.0085	U	0.0087	U	0.0081	U	0.0088	U
PETROLEUM HYDROCARBONS (mg/kg)																										
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000		4	U	3.3	U	3.8	U	3.6	U	2.9	U	3.6	U	3.1	U	3.6	U	3.2	U	3.4	U	3.2	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000		4.4	U	4.3	U	4.1	U	4.2	U	4.2	U	4.3	U	4.3	U	4.2	U	4.3	U	**22.6**		4.3	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000		4.4	U	4.3	U	4.1	U	4.2	U	4.2	U	4.3	U	4.3	U	4.2	U	4.3	U	**5.78**	J	4.3	U
CYANIDE (mg/kg)																										
CYANIDE	NE	22.0	46.9		0.079	U	0.076	U	0.074	U	0.073	U	0.073	U	0.078	U	0.077	U	0.074	U	0.075	U	0.073	U	**0.087**	J
TRITIUM (pCi/g)																										
TRITIUM	NE	NE	NE		5.21	U	5.28	U	4.96	U	5.19	U	5.1	U	5.22	U	5.24	U	4.92	U	5.16	U	5.33	U	4.88	U

Risk Addtivity
Soil Analytical Data
Building 924 (OT-C532) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]
			Sample Number
			Sample Date
			Location
			Depth (ft bgs)
PERCENT SOLIDS	NE	NE	NE
VOLATILES (mg/kg)			
1,1,1-TRICHLOROETHANE	NE	8700	15600
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100
1,1,2-TRICHLOROETHANE	NE	1.1	2.81
1,1-DICHLOROETHANE	NE	3.3	64.5
1,1-DICHLOROETHENE	NE	240	449
1,2,4-TRICHLOROBENZENE	NE	22	73.0
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86
1,2-DIBROMOETHANE	NE	0.034	0.588
1,2-DICHLOROBENZENE	NE	1900	2310
1,2-DICHLOROETHANE	NE	0.43	7.89
1,2-DICHLOROPROPANE	NE	0.94	15.2
1,3-DICHLOROBENZENE	NE	NE	NE
1,4-DICHLOROBENZENE	NE	2.4	31.7
2-HEXANONE	NE	210	NE
ACETONE	NE	61000	66600
BENZENE	NE	1.1	15.4
BROMODICHLOROMETHANE	NE	0.27	5.41
BROMOFORM	NE	62	616
BROMOMETHANE	NE	7.3	16.5
CARBON DISULFIDE	NE	820	1530
CARBON TETRACHLORIDE	NE	0.61	10.8
CHLOROBENZENE	NE	290	376
CHLOROETHANE	NE	15000	29800
CHLOROFORM	NE	0.29	5.86
CHLOROMETHANE	NE	120	275
CIS-1,2-DICHLOROETHYLENE	NE	160	156
CIS-1,3-DICHLOROPROPENE	NE	NE	NE
CYCLOHEXANE	NE	7000	NE
DIBROMOCHLOROMETHANE	NE	0.68	12.1
DICHLORODIFLUOROMETHANE	NE	94	168
ETHYLBENZENE	NE	5.4	68.4
ISOPROPYLBENZENE	NE	2100	2430
METHYL ACETATE	NE	78000	78200
METHYL ETHYL KETONE	NE	28000	37100
METHYL ISOBUTYL KETONE	NE	5300	5820
METHYLCYCLOHEXANE	NE	5630	5630
METHYLENE CHLORIDE	NE	56	409

Risk Additivity Evaluation at Building 924, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
1,1,1-TRICHLOROETHANE		ND		
1,1,2,2-TETRACHLOROETHANE		ND		
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND		
1,1,2-TRICHLOROETHANE		ND		
1,1-DICHLOROETHANE		ND		
1,1-DICHLOROETHENE		ND		
1,2,4-TRICHLOROBENZENE		ND		
1,2-DIBROMO-3-CHLOROPROPANE		ND		
1,2-DIBROMOETHANE		ND		
1,2-DICHLOROBENZENE		ND		
1,2-DICHLOROETHANE		ND		
1,2-DICHLOROPROPANE		ND		
1,3-DICHLOROBENZENE		ND		
1,4-DICHLOROBENZENE		ND		
2-HEXANONE		ND		
ACETONE	N	**0.0181**	0.0000003	
BENZENE		ND		
BROMODICHLOROMETHANE		ND		
BROMOFORM		ND		
BROMOMETHANE		ND		
CARBON DISULFIDE		ND		
CARBON TETRACHLORIDE		ND		
CHLOROBENZENE		ND		
CHLOROETHANE		ND		
CHLOROFORM		ND		
CHLOROMETHANE		ND		
CIS-1,2-DICHLOROETHYLENE		ND		
CIS-1,3-DICHLOROPROPENE		ND		
CYCLOHEXANE		ND		
DIBROMOCHLOROMETHANE		ND		
DICHLORODIFLUOROMETHANE		ND		
ETHYLBENZENE		ND		
ISOPROPYLBENZENE		ND		
METHYL ACETATE		ND		
METHYL ETHYL KETONE		ND		
METHYL ISOBUTYL KETONE		ND		
METHYLCYCLOHEXANE		ND		
METHYLENE CHLORIDE		ND		

Risk Addtivity
Soil Analytical Data
Building 924 (OT-C532) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	Risk Additivity Evaluation at Building 924, Holloman AFB				
			Sample Date					
			Location					
			Depth (ft bgs)					
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
VOLATILES - continued (mg/kg)				VOLATILES - continued (mg/kg)				
STYRENE	NE	6300	7280	STYRENE		ND		
TERT-BUTYL METHYL ETHER	NE	43	901	TERT-BUTYL METHYL ETHER		ND		
TETRACHLOROETHYLENE	NE	22	7.02	TETRACHLOROETHYLENE		ND		
TOLUENE	NE	5000	5270	TOLUENE		ND		
TRANS-1,2-DICHLOROETHENE	NE	150	270	TRANS-1,2-DICHLOROETHENE		ND		
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	TRANS-1,3-DICHLOROPROPENE		ND		
TRICHLOROETHYLENE	NE	0.91	8.77	TRICHLOROETHYLENE		ND		
TRICHLOROFLUOROMETHANE	NE	790	1410	TRICHLOROFLUOROMETHANE		ND		
VINYL CHLORIDE	NE	0.06	0.728	VINYL CHLORIDE		ND		
XYLENES, TOTAL	NE	630	814	XYLENES, TOTAL		ND		
SEMIVOLATILES (mg/kg)				SEMIVOLATILES (mg/kg)				
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	2,2'-OXYBIS(1-CHLORO)PROPANE		ND		
2,4,5-TRICHLOROPHENOL	NE	6100	6110	2,4,5-TRICHLOROPHENOL		ND		
2,4,6-TRICHLOROPHENOL	NE	44	61.1	2,4,6-TRICHLOROPHENOL		ND		
2,4-DICHLOROPHENOL	NE	180	183	2,4-DICHLOROPHENOL		ND		
2,4-DIMETHYLPHENOL	NE	1200	1220	2,4-DIMETHYLPHENOL		ND		
2,4-DINITROPHENOL	NE	120	122	2,4-DINITROPHENOL		ND		
2,4-DINITROTOLUENE	NE	1.6	15.7	2,4-DINITROTOLUENE		ND		
2,6-DINITROTOLUENE	NE	61	61.1	2,6-DINITROTOLUENE		ND		
2-CHLORONAPHTHALENE	NE	6300	6260	2-CHLORONAPHTHALENE		ND		
2-CHLOROPHENOL	NE	390	391	2-CHLOROPHENOL		ND		
2-METHYLNAPHTHALENE	NE	230	NE	2-METHYLNAPHTHALENE		ND		
2-METHYLPHENOL	NE	3100	NE	2-METHYLPHENOL		ND		
2-NITROANILINE	NE	610	NE	2-NITROANILINE		ND		
2-NITROPHENOL	NE	NE	NE	2-NITROPHENOL		ND		
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	3,3'-DICHLOROBENZIDINE		ND		
3-NITROANILINE	NE	NE	NE	3-NITROANILINE		ND		
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	4,6-DINITRO-2-METHYLPHENOL		ND		
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	4-BROMOPHENYL PHENYL ETHER		ND		
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	4-CHLORO-3-METHYLPHENOL		ND		
4-CHLOROANILINE	NE	2.4	NE	4-CHLOROANILINE		ND		
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	4-CHLOROPHENYL PHENYL ETHER		ND		
4-NITROANILINE	NE	24	NE	4-NITROANILINE		ND		
4-NITROPHENOL	NE	NE	NE	4-NITROPHENOL		ND		
ACENAPHTHENE	NE	3400	3440	ACENAPHTHENE		ND		
ACENAPHTHYLENE	NE	NE	NE	ACENAPHTHYLENE		ND		
ACETOPHENONE	NE	7800	7820	ACETOPHENONE		ND		
ANTHRACENE	NE	17000	17200	ANTHRACENE		ND		
ATRAZINE	NE	2.1	NE	ATRAZINE		ND		

Risk Addtivity
Soil Analytical Data
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Analyte			Sample Number						
			Sample Date						
			Location						
			Depth (ft bgs)						
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]						
SEMIVOLATILES - continued (mg/kg)									
BENZALDEHYDE	NE	7800	NE						
BENZO(A)ANTHRACENE	NE	0.15	1.48						
BENZO(A)PYRENE	NE	0.015	0.148						
BENZO(B)FLUORANTHENE	NE	0.15	1.48						
BENZO(G,H,I)PERYLENE	NE	NE	NE						
BENZO(K)FLUORANTHENE	NE	1.5	14.8						
BENZYL BUTYL PHTHALATE	NE	260	NE						
BIPHENYL	NE	51	57.1						
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE						
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68						
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347						
CAPROLACTAM	NE	31000	NE						
CARBAZOLE	NE	NE	NE						
CHRYSENE	NE	15	148						
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148						
DIBENZOFURAN	NE	78	NE						
DIETHYL PHTHALATE	NE	49000	48900						
DIMETHYL PHTHALATE	NE	611000	611000						
DI-N-BUTYL PHTHALATE	NE	6100	6110						
DI-N-OCTYLPHTHALATE	NE	730	NE						
FLUORANTHENE	NE	2300	2290						
FLUORENE	NE	2300	2290						
HEXACHLOROBENZENE	NE	0.3	3.04						
HEXACHLOROBUTADIENE	NE	6.2	61.1						
HEXACHLOROCYCLOPENTADIENE	NE	370	367						
HEXACHLOROETHANE	NE	12	42.8						
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48						
ISOPHORONE	NE	510	5120						
M,P-CRESOL	NE	NE	NE						
NAPHTHALENE	NE	3.6	43.0						
NITROBENZENE	NE	4.8	53.5						
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE						
N-NITROSODIPHENYLAMINE	NE	99	993						
PENTACHLOROPHENOL	NE	0.89	8.94						
PHENANTHRENE	NE	1830	1830						
PHENOL	NE	18000	18300						
PYRENE	NE	1700	1720						

Risk Additivity Evaluation at Building 924, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
SEMIVOLATILES - continued (mg/kg)				
BENZALDEHYDE		ND		
BENZO(A)ANTHRACENE		ND		
BENZO(A)PYRENE		ND		
BENZO(B)FLUORANTHENE		ND		
BENZO(G,H,I)PERYLENE		ND		
BENZO(K)FLUORANTHENE		ND		
BENZYL BUTYL PHTHALATE		ND		
BIPHENYL		ND		
BIS(2-CHLOROETHOXY) METHANE		ND		
BIS(2-CHLOROETHYL) ETHER		ND		
BIS(2-ETHYLHEXYL) PHTHALATE	C	**0.55**	1.58E-08	
CAPROLACTAM		ND		
CARBAZOLE		ND		
CHRYSENE		ND		
DIBENZ(A,H)ANTHRACENE		ND		
DIBENZOFURAN		ND		
DIETHYL PHTHALATE		ND		
DIMETHYL PHTHALATE		ND		
DI-N-BUTYL PHTHALATE		ND		
DI-N-OCTYLPHTHALATE		ND		
FLUORANTHENE		ND		
FLUORENE		ND		
HEXACHLOROBENZENE		ND		
HEXACHLOROBUTADIENE		ND		
HEXACHLOROCYCLOPENTADIENE		ND		
HEXACHLOROETHANE		ND		
INDENO(1,2,3-C,D)PYRENE		ND		
ISOPHORONE		ND		
M,P-CRESOL		ND		
NAPHTHALENE		ND		
NITROBENZENE		ND		
N-NITROSODI-N-PROPYLAMINE		ND		
N-NITROSODIPHENYLAMINE		ND		
PENTACHLOROPHENOL		ND		
PHENANTHRENE		ND		
PHENOL		ND		
PYRENE		ND		

Risk Addtivity
Soil Analytical Data
Building 924 (OT-C532) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	
			Sample Date	
			Location	
			Depth (ft bgs)	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	
EXPLOSIVES (mg/kg)				
1,3,5-TRINITROBENZENE	NE	2200.0	NE	
1,3-DINITROBENZENE	NE	6.10	NE	
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	
2,4-DINITROTOLUENE	NE	1.60	15.7	
2,6-DINITROTOLUENE	NE	61.0	61.1	
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	
2-NITROTOLUENE	NE	2.90	29.1	
3-NITROTOLUENE	NE	6.10	7.82	
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	
4-NITROTOLUENE	NE	30.0	244.4	
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	
NITROBENZENE	NE	4.80	53.5	
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	
TETRYL	NE	240.0	244.0	
METALS (mg/kg)				
ALUMINUM	13722	77000	78000	
ANTIMONY	1.6	31	31.3	
ARSENIC	3.7	0.39	3.90	
BARIUM	169	15000	15600	
BERYLLIUM	1.6	160	156	
CADMIUM	0.3	70	70.3	
CALCIUM	317332	NE	NE	
CHROMIUM[d]	25	117000	117000	
COBALT	7.7	23	NE	
COPPER	13	3100	3130	
IRON	23049	55000	54800	
LEAD	10.9	400	400	
MAGNESIUM	16991	NE	NE	
MANGANESE	393	1800	1860	
MERCURY	0.0108	10	15.6	
NICKEL	17.4	1500	1560	
POTASSIUM	5077	NE	NE	
SELENIUM	1.4	390	391	
SILVER	1.1	390	391	
SODIUM	5196	NE	NE	
THALLIUM	1.3	0.78	0.782	
VANADIUM	42.6	390	391	
ZINC	54.6	23000	23500	

Risk Additivity Evaluation at Building 924, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio	
EXPLOSIVES (mg/kg)					
1,3,5-TRINITROBENZENE		ND			
1,3-DINITROBENZENE		ND			
2,4,6-TRINITROTOLUENE		ND			
2,4-DINITROTOLUENE		ND			
2,6-DINITROTOLUENE		ND			
2-AMINO-4,6-DINITROTOLUENE		ND			
2-NITROTOLUENE		ND			
3-NITROTOLUENE		ND			
4-AMINO-2,6-DINITROTOLUENE		ND			
4-NITROTOLUENE		ND			
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE		ND			
NITROBENZENE		ND			
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCIN		ND			
TETRYL		ND			
METALS (mg/kg)					
ALUMINUM	N	9980		0.13	
ANTIMONY		ND			
ARSENIC	C	3	7.70E-06		
BARIUM	N	69.6		0.0045	
BERYLLIUM		ND			
CADMIUM		ND			
CALCIUM	NUTRIENT	279000			
CHROMIUMd	N	8.7		0.000074	
COBALT	N	3.3		0.14	RSL
COPPER	N	8.4		0.0027	
IRON	N	10200		0.19	
LEAD	N	6.3		0.016	
MAGNESIUM	NUTRIENT	11500			
MANGANESE	N	209		0.11	
MERCURY		ND			
NICKEL	N	8.4		0.0054	
POTASSIUM	NUTRIENT	3110			
SELENIUM		ND			
SILVER		ND			
SODIUM	NUTRIENT	3250			
THALLIUM		ND			
VANADIUM	N	15.3		0.039	
ZINC	N	29.2		0.0012	

Risk Addtivity
Soil Analytical Data
Building 924 (OT-C532) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	
			Sample Date	
			Location	
			Depth (ft bgs)	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	
PCBs (mg/kg)				
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	
PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	
OIL RANGE ORGANICS C28-C40	NE	NE	1000	
CYANIDE (mg/kg)				
CYANIDE	NE	22.0	46.9	
TRITIUM (pCi/g)				
TRITIUM	NE	NE	NE	

Risk Additivity Evaluation at Building 924, Holloman AFB

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
PCBs (mg/kg)				
PCB-1016 (AROCLOR 1016)		ND		
PCB-1221 (AROCLOR 1221)		ND		
PCB-1232 (AROCLOR 1232)		ND		
PCB-1242 (AROCLOR 1242)		ND		
PCB-1248 (AROCLOR 1248)		ND		
PCB-1254 (AROCLOR 1254)		ND		
PCB-1260 (AROCLOR 1260)		ND		
PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10		ND		
DIESEL RANGE ORGANICS C10-C28	N	22.6		0.023
OIL RANGE ORGANICS C28-C40	N	5.78		0.0058
CYANIDE (mg/kg)				
CYANIDE	N	0.087		0.0019
TRITIUM (pCi/g)				
TRITIUM		ND		
SUM:			**7.7E-06**	**0.67**

Risk Additivity
Soil Analytical Data
Buidling 924 (OT-C532) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, February, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RCRA = Resource Recovery and Conservation Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

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Appendix J
Ecological Evaluation

NEW MEXICO ENVIRONMENT DEPARTMENT
SITE ASSESSMENT CHECKLIST
(From NMED (2012) Attachment A)

I. SITE LOCATION

1. Site Name: Building 924 (OT-C532) Inactive Septic System
   US EPA I.D. Number: NM6572124422
   Location: Tularosa Basin within Holloman Air Force Base (HAFB)
   County: Otero
   City: HAFB State: NM

2. Latitude: 32º 50´ 3.866˝ N Longitude: 106º 7´ 32.570˝ W

3. Attach site maps, including a topographical map, a diagram which illustrates the layout of the facility (e.g., site boundaries, structures, etc.), and maps showing all habitat areas identified in Section III of the checklist. Also, include maps which illustrate known release areas, sampling locations, and any other important features, if available. Note: Site maps and supporting information that include (1) a Physiographic Map, (2) a Site Layout and Sampling Location Map, and (3) a Site Photo Log are generally included for all sites in the RFI reports. A site habitat map and a Google Earth photo that shows the site habitat are attached to this Site Assessment checklist.

II. SITE CHARACTERIZATION

1. Indicate the approximate area of the site (i.e., acres or sq. ft): Approximately 2 acres

2. Provide an approximate breakdown of the land uses on the site:

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	_____% Undisturbed	100% Other[c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, etc.):
_____

[b]For agricultural areas, please list the crops and/or livestock which are present:
_____

[c]For areas designated as "other", please describe the usage of the area:
Building 924 was constructed in 1959 for ammunition assembly, primarily for bolting rocket components together before use. It was later used for the maintenance of radar tracking equipment, munitions storage, and rocket motor storage. The Septic Tanks Report (HAFB, 2007) indicates that the building contained a toilet urinal,

lavatory, and janitorial sink which discharged to the sewer system. There was no floor drain at Building 924. The septic tank was abandoned in place in January 2008 by opening the tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill.

3. Provide an approximate breakdown of the land uses in the area surrounding the site. Indicate the radius (in miles) of the area described: approximately 0.5 mile

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	_~50_% Undisturbed	~50 % Other [c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, golf course, etc.):

---

[b]For agricultural areas, please list the crops and/or livestock which are present:

---

[c]For areas designated as "other", please describe the usage of the area:
Habitat Map for Holloman AFB (attached Figure 1) shows that habitat within 0.5 mile radius contains approximately 50 percent classified as "Development/Ground Disturbance."

4. Describe reasonable and likely future land and/or water use(s) at the site.
Land use is likely to remain the same.

5. Describe the historical uses of the site. Include information on chemical releases that may have occurred as a result of previous land uses. For each chemical release, provide information on the form of the chemical released (i.e., solid, liquid, vapor) and the known or suspected causes or mechanism of the release (i.e., spills, leaks, material disposal, dumping, explosion, etc.).

According to information provided in the Holloman Air Force Base Septic Tanks Report (HAFB, 2007), Building 924 was constructed in 1959 for ammunition assembly, primarily for bolting rocket components together before use. It was later used for the maintenance of radar tracking equipment, munitions storage, and rocket motor storage. Except for releases associated with the septic system and leach field, no chemical releases are known to have occurred at the site.

6. If any movement of soil has taken place at the site, describe the degree of the disturbance. Indicate the likely source of any disturbances (e.g., erosion, agricultural, mining, industrial activities, removals, etc.) and estimate when these events occurred.

Site disturbances of soil have been limited to excavation activities associated with building construction and septic system installation.

7. Describe the current uses of the site. Include information on recent (previous 5 years) disturbances or chemical releases that have occurred. For each chemical release, provide information on the form of the chemical released and the causes or mechanism of the release.

According to information provided in the Holloman Air Force Base Septic Tanks Report (HAFB, 2007), Building 924 was utilized for munitions storage. Releases are assumed to be associated with the septic system and leach field. Current site usage is the same.

8. Identify the location or suspected location of chemical releases at the site. Provide an estimate of the distance between these locations and the areas identified in Section III.

Chemical releases that may have occurred are associated with septic system leakage.

9. Identify the suspected contaminants of concern (COCs) at the site. If known, include the maximum contaminant levels. Please indicate the source of data cited (e.g., RFI, confirmatory sampling, etc.).

Detected constituents from soil samples collected include several metals, cyanide, one SVOC (bis-2-ethylhexyl phthalate), and one VOC (acetone). Additionally, samples were analyzed for explosives, TPH, PCBs, and cyanide; however all were non-detect in soil samples from the site (for 0 to 10 feet bgs, the zone of interest for ecological receptors).

10. Identify the media (e.g., soil (surface or subsurface), surface water, air, groundwater) which are known or suspected to contain COCs.
Surface and subsurface soil and groundwater

11. Indicate the approximate depth to groundwater (in feet below ground surface [(bgs)].

Groundwater was investigated at the Building 924 former septic tank location. The only groundwater encountered during soil boring installation was at Station 2, which had a thin, localized saturated zone at 15 feet bgs. This zone was not considered adequate to produce groundwater in an amount sufficient for the collection of groundwater samples. No groundwater was observed in any of the other three borings placed along the septic tank influent line and leach field, at distances of up to 50 feet away from the former UST location. A monitoring well was planned for installation at the Station 4 leach field location. However, since groundwater was not encountered, a monitoring well was not installed, and groundwater sampling was not performed as a part of the investigation.

12. Indicate the direction of groundwater flow (e.g., north, southeast, etc.)

Not applicable since there is no groundwater at the site.

III. HABITAT EVALUATION

III.A Wetland Habitats

Are any wetland[1] areas such as marshes or swamps on or adjacent to the site?

☐ Yes X No

If yes, indicate the wetland area on the attached site map and answer the following questions regarding the wetland area. If more than one wetland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wetland area. Distinguish between wetland areas by using names or other designations (such as location), and clearly identify each area on the site map. Also, obtain and attach a National Wetlands Inventory Map (or maps) to illustrate each wetland area.

Identify the sources of the observations and information (e.g., National Wetland Inventory, Federal or State Agency, USGS topographic maps) used to make the determination that wetland areas are or are not present.

USGS Topographic Maps

If no wetland areas are present, proceed to Section III.B.

1Wetlands are defined in 40 CFR §232.2 as " Areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Examples of typical wetlands plants include: cattails, cordgrass, willows and cypress trees. National wetland inventory maps may be available at http:\\nwi.fws.gov. Additional information on wetland delineation criteria is also available from the Army Corps of Engineers.

Wetland Area Questions

☐ Onsite ☐ Offsite

Name or
Designation:_____

1. Indicate the approximate area of the wetland (acres or ft^2)_____

2. Identify the type(s) of vegetation present in the wetland.

   - ❑ Submergent (i.e., underwater) vegetation
   - ❑ Emergent (i.e., rooted in the water, but rising above it) vegetation
   - ❑ Floating vegetation
   - ❑ Scrub/shrub
   - ❑ Wooded
   - ❑ Other (Please describe):_____

3. Estimate the vegetation density of the wetland area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Is standing water present? ☐ Yes ☐ No

   If yes, is the water primarily: ☐ Fresh or ☐ Brackish
   Indicate the approximate area of the standing water (ft^2): _____
   Indicate the approximate depth of the standing water, if known (ft. or in.)_____

5. If known, indicate the source of the water in the wetland.

   - ❑ Stream/River/Creek/Lake/Pond
   - ❑ Flooding
   - ❑ Groundwater
   - ❑ Surface runoff

6. Is there a discharge from the facility to the wetland? ☐ Yes ☐ No

   If yes, please
   describe:_____
   _____
   _____
   _____
   _____

Wetland Area Questions (Continued)

7. Is there a discharge from the wetland? ☐ Yes ☐ No
   If yes, indicate the type of aquatic feature the wetland discharges into:

   - ❑ Surface stream/River (Name:_____)
   - ❑ Lake/Pond (Name:_____)
   - ❑ Groundwater
   - ❑ Not sure

8. Does the area show evidence of flooding? ☐ Yes ☐ No
   If yes, indicate which of the following are present (mark all that apply):

   - ❑ Standing water
   - ❑ Water-saturated soils
   - ❑ Water marks
   - ❑ Buttressing
   - ❑ Debris lines
   - ❑ Mud cracks
   - ❑ Other (Please describe):_____

9. Animals observed in the wetland area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:

   _____
   _____
   _____
   _____

III.B Aquatic Habitats

III.B.1 Non-Flowing Aquatic Features

Are any non-flowing aquatic features (such as ponds or lakes) located at or adjacent to the site?

☐ Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the non-flowing aquatic features. If more than one non-flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.B.2.

Non-Flowing Aquatic Feature Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Indicate the type of aquatic feature present:

   - ❑ Natural (e.g., pond or lake)
   - ❑ Man-made (e.g., impoundment, lagoon, canal, etc.)

2. Estimate the approximate size of the water body (in acres or sq. ft.)_____

3. If known, indicate the depth of the water body (in ft. or in.)._____

4. **Non-Flowing Aquatic Feature Questions (Continued)**

5. Indicate the general composition of the bottom substrate. Mark all sources that apply from the following list.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

☐ Other (please specify):_____

6. Indicate the source(s) of the water in the aquatic feature. Mark all sources that apply from the following list.

- ❑ River/Stream/Creek
- ❑ Groundwater
- ❑ Industrial Discharge
- ❑ Surface Runoff
- ❑ Other (please specify):_____

7. Is there a discharge from the facility to the aquatic feature? ☐ Yes ☐ No
   If yes, describe the origin of each discharge and its migration path:
   _____
   _____
   _____
   _____

8. Does the aquatic feature discharge to the surrounding environment? ☐ Yes ☐ No
   If yes, indicate the features from the following list into which the aquatic feature discharges, and indicate whether the discharge occurs onsite or offsite:

- ❑ River/Stream/Creek ☐ onsite ☐ offsite
- ❑ Groundwater ☐ onsite ☐ offsite
- ❑ Wetland ☐ onsite ☐ offsite
- ❑ Impoundment ☐ onsite ☐ offsite
- ❑ Other (please describe)_____

Non-Flowing Aquatic Feature Questions (Continued)

9. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Fish
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, turtles)
- ❑ Amphibians (e.g., frogs, salamanders)
- ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

Specify species, if known:

_____

_____

_____

_____

III.B.2 Flowing Aquatic Features

Are any flowing aquatic features (such as streams or rivers) located at or adjacent to the site?

☐ Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the flowing aquatic features. If more than one flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map

If no, proceed to Section III.C.

Flowing Aquatic Feature Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Indicate the type of flowing aquatic feature present.

   - ❑ River
   - ❑ Stream
   - ❑ Creek
   - ❑ Brook
   - ❑ Dry wash
   - ❑ Arroyo
   - ❑ Intermittent stream
   - ❑ Artificially created (ditch, etc.)
   - ❑ Other (specify)
   - ❑

2. Indicate the general composition of the bottom substrate.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

   ☐ Other (please specify):_____

3. Describe the condition of the bank (e.g., height, slope, extent of vegetative cover) of the aquatic feature.

   _____
   _____
   _____
   _____

4. Is there a discharge from the facility to the aquatic feature? ☐ Yes ☐ No
   If yes, describe the origin of each discharge and its migration path:

   _____
   _____
   _____
   _____

5. Indicate the discharge point of the water body. Specify name, if known.

   _____
   _____
   _____

Flowing Aquatic Feature Questions (Continued)

6. If the flowing aquatic feature is a dry wash or arroyo, answer the following questions.
   - ❑ Check here if feature is not a dry wash or arroyo

   If known, specify the average number of days in a year in which flowing water is present in the feature: _____

   Is standing water or mud present? Check all that apply.
   - ❑ Standing water
   - ❑ Mud
   - ❑ Neither standing water or mud

   Does the area show evidence of recent flow (e.g., flood debris clinging to vegetation)?
   - ❑ Yes
   - ❑ No
   - ❑ Not sure
7. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:

   _____
   _____
   _____
   _____

III.C Terrestrial Habitats

III.C.1 Wooded

Are any wooded areas on or adjacent to the site? ☐ Yes X No

If yes, indicate the wooded area on the attached site map and answer the following questions. If more than one wooded area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wooded area. Distinguish between wooded areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.2.

Wooded Area Questions

☐ On-site ☐ Off-site

Name or Designation:_____

1. Estimate the approximate size of the wooded area (in acres or sq. ft.)

2. Indicate the dominant type of vegetation in the wooded area.

   - ❑ Evergreen
   - ❑ Deciduous
   - ❑ Mixed

Dominant plant species, if known:_____

3. Estimate the vegetation density of the wooded area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the predominant size of the trees at the site. Use diameter at chest height.

   - ❑ 0-6 inches
   - ❑ 6-12 inches
   - ❑ >12 inches
   - ❑ No single size range is predominant

5. Animals observed in the wooded area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:_____

III.C.2 Shrub/Scrub

Are any shrub/scrub areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the shrub/scrub area on the attached site map and answer the following questions. If more than one shrub/scrub area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual shrub/scrub area. Distinguish between shrub/scrub areas, using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.3.

Shrub/Scrub Area Questions

X Onsite X Offsite

Name or Designation: Chihuahuan Desert Scrub (HAFB, 2011).

Note also: On-site areas are almost entirely gravel covered and void of habitat or vegetation with some apparent pockets of desert vegetation. Surrounding site habitat is characterized as Chihuahuan Desert. The habitat map (Figure 1) shows that habitat surrounding the site is dominated by alkali sacaton grassland habitat.

1. Estimate the approximate size of the shrub/scrub area (in acres or sq. ft.).
   Surrounding HAFB are tens of thousands of acres of Chihuahuan Desert Scrub.

2. Indicate the dominant type of shrub/scrub vegetation present, if known.

According to information provided in Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011), the area around Building 924 and OT-C532 is dominated by Alkali Sacaton Grassland.

3. Estimate the vegetation density of the shrub/scrub area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - X Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the scrub/shrub vegetation.

   - ❑ 0-2 feet
   - X 2-5 feet
   - ❑ >5 feet

5. Animals observed in the shrub/scrub area or suspected to be present based on indirect evidence or file material:
   - X Birds
   - X Mammals
   - X Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:
   The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna associated with the shrubland habitat potentially present in the area of Building 924. Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam

kangaroo rat (*Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.3 Grassland

Are any grassland areas on or adjacent to the site? ☐ Yes X No

If yes, indicate the grassland area on the attached site map and answer the following questions. If more than one grassland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual grassland area. Distinguish between grassland areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.4.

Grassland Area Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Estimate the approximate size of the grassland area (in acres or sq. ft.)._____

2. Indicate the dominant plant type, if known.
_____
_____
_____
_____

3. Estimate the vegetation density of the grassland area.

- ❑ Dense (i.e., greater than 75% vegetation)
- ❑ Moderate (i.e., 25% to 75% vegetation)
- ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the dominant plant type (in ft. or in.)_

5. Animals observed in the grassland area or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, lizards)
- ❑ Amphibians (e.g., toads, salamanders)

Specify species, if known:

III.C.4 Desert

Are any desert areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the desert area on the attached site map and answer the following questions. If more than one desert area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual desert area. Distinguish between desert areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.5.

Desert Area Questions

X Onsite ☐ Offsite
Name or Designation: Chihuahuan Desert

1. Estimate the approximate size of the desert area (in acres or sq. ft.). This site including HAFB is contained within tens of thousands of acres of the Chihuahuan Desert.

2. Describe the desert area (e.g., presence or absence of vegetation, vegetation types, presence/size of rocks, sand, etc.)
Many volumes of literature have been written on the natural biota of the Chihuahuan Desert. Detailed descriptions about the biotic communities within HAFB can be found in the HAFB Integrated Natural Resource Management Plan, (HAFB, 2011). Habitats directly associated with this Site include typical desert scrub communities.

3. Animals observed in the desert area or suspected to be present based on indirect evidence or file material:

X Birds
X Mammals
X Reptiles (e.g., snakes, lizards)
☐ Amphibians (e.g., toads, salamanders)

Specify species, if known:

The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna associated with the shrubland habitat potentially present in the area of Building 924. Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam

kangaroo rat (*Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.5 Other

1. Are there any other terrestrial communities or habitats on or adjacent to the site which were not previously described?

☐ Yes ☒ No

If yes, indicate the "other" area(s) on the attached site map and describe the area(s) below. Distinguish between onsite and offsite areas. If no, proceed to Section III.D.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

III.D Sensitive Environments and Receptors

1. Do any other potentially sensitive environmental areas[2] exist adjacent to or within 0.5 miles of the site? If yes, list these areas and provide the source(s) of information used to identify sensitive areas. *Do not answer "no" without confirmation from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

The following is taken from the Integrated Natural Resources Management Plan for HAFB (HAFB,2011). HAFB and its Geographically Separated Units (GSUs) have high biodiversity, including many sensitive species. No threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The White Sands pupfish is not Federally-listed nor has critical habitat been designated because of the multi-agency cooperative agreement to manage the species to support viable populations through habitat management and research.

Most of the sensitive species are birds that are either associated with grassland habitats on main base or with wetland habitats, primarily in the Lake Holloman Public Access Area

2 Areas that provide unique and often protected habitat for wildlife species. These areas are typically used during critical life stages such as breeding, hatching, rearing of young and overwintering. Refer to **Table 1** at the end of this document for examples of sensitive environments.

wetlands complex south of the Cantonment. Sensitive grassland and desert species at HAFB that are discussed in further detail in the management plan include:

- White Sands pupfish
- Acarospora clauzadeana lichen
- Grassland neotropical migratory birds
- Western burrowing owl
- Aplomado falcon
- Grassland raptors
- Bats
- Texas horned lizard and other reptiles

2. Are any areas on or near (i.e., within 0.5 miles) the site which are owned or used by local tribes? If yes, describe. *Contact the Tribal Liason in the Office of the Secretary (505)827-2855 to obtain this information.*

No

3. Does the site serve or potentially serve as a habitat, foraging area, or refuge by rare, threatened, endangered, candidate and/or proposed species (plants or animals), or any otherwise protected species? If yes, identify species. *This information should be obtained from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

No, based on information in the Integrated Natural Resources Management Plan, no threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The plan establishes protocols for management of sensitive desert and grassland habitats.

4. Is the site potentially used as a breeding, roosting or feeding area by migratory bird species? If yes, identify which species.

Likely not. The site has very limited viable habitat due to the disturbed nature of the site, but areas surrounding the site could potentially provide habitat for these purposes.

5. Is the site used by any ecologically[3], recreationally, or commercially important

3 Ecologically important species include populations of species which provide a critical (i.e., not replaceable) food resource for higher organisms and whose function as such would not be replaced by more tolerant species; or perform a critical ecological function (such as organic matter decomposition) and whose functions will not be replaced by other species. Ecologically important species include pest and opportunistic species that populate an area if they serve as a food source for other species, but do not include domesticated animals (e.g., pets and livestock) or plants/animals whose existence is maintained by continuous human interventions (e.g., fish hatcheries, agricultural crops, etc.,)

species? If yes, explain.

No

IV. EXPOSURE PATHWAY EVALUATION

1. Do existing data provide sufficient information on the nature, rate, and extent of contamination at the site?

   X Yes
   ❑ No
   ❑ Uncertain

   Please provide an explanation for your answer: Sample results have sufficiently characterized the site.

2. Do existing data provide sufficient information on the nature, rate, and extent of contamination in offsite affected areas?

   □ Yes
   ❑ No
   ❑ Uncertain
   X No offsite contamination

   Please provide an explanation for your answer:
   No offsite contamination is expected, and no off-site soil or groundwater samples were collected.

3. Do existing data address potential migration pathways of contaminants at the site?

X Yes
❑ No
❑ Uncertain

Please provide an explanation for your answer

Although a minimal localized zone of saturated groundwater was recorded at 15 feet bgs, no groundwater samples have been collected from the site, due to general lack of groundwater at the site. While potential migration from impacted soils to groundwater might occur, no ecological exposure to groundwater is expected.

4. Do existing data address potential migration pathways of contaminants in offsite affected areas?

X Yes
❑ No
❑ Uncertain
❑ No offsite contamination

Please provide an explanation for your answer:

See response to No. 3 presented previously. Also, no off-site soil contamination is expected.

5. Are there visible indications of stressed habitats or receptors on or near (i.e., within 0.5 miles) the site that may be the result of a chemical release? If yes, explain. Attach photographs if available.

No.

6. Is the location of the contamination such that receptors might be reasonably expected to come into contact with it? For soil, this means contamination in the soil 0 to 5 feet below ground surface (bgs). If yes, explain.

Yes. Some soil samples were collected in site areas where receptors might contact detected constituents.

7. Are receptors located in or using habitats where chemicals exist in air, soil, sediment or surface water? If yes, explain.

Yes. See response to No. 6 presented above.

8. Could chemicals reach receptors via groundwater? Can chemicals leach or dissolve to groundwater? Are chemicals mobile in groundwater? Does groundwater discharge into receptor habitats? If yes, explain.

No groundwater was encountered beneath the site (except for minimal, localized zone of saturated groundwater recorded at 15 feet bgs).

9. Could chemicals reach receptors through runoff or erosion? Answer the following questions:

What is the approximate distance from the contaminated area to the nearest watercourse or arroyo?

- ❑ 0 feet (i.e., contamination has reached a watercourse or arroyo)
- ❑ 1-10 feet
- ❑ 11-20 feet
- ❑ 21-50 feet
- ❑ 51-100 feet
- ❑ 101-200 feet
- ❑ > 200 feet
- ❑ > 500 feet
- X > 1000 feet

What is the slope of the ground in the contaminated area?

- X 0-10%
- ❑ 10-30%
- ❑ > 30%

What is the approximate amount of ground and canopy vegetative cover in the contaminated area?

- ❑ < 25%
- X 25-75%
- ❑ > 75%

Is there visible evidence of erosion (e.g., a rill or gully) in or near the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

Do any structures, pavement, or natural drainage features direct run-on flow (i.e., surface flows originating upstream or uphill from the area of concern) into the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

10. Could chemicals reach receptors through the dispersion of contaminants in air (e.g., volatilization, vapors, fugitive dust)? If yes, explain.

Yes. However, detected concentrations of constituents in soil do not generally exceeding relevant background values or ecological screening criteria (see screening assessment in main text).

11. Could chemicals reach receptors through migration of non-aqueous phase liquids (NAPLs)? Is a NAPL present at the site that might be migrating towards receptors or habitats? Could NAPL discharge contact receptors or their habitat?

No NAPLs are present at the site.

12. Could receptors be impacted by external irradiation at the site? Are gamma emitting radionuclides present at the site? Is the radionuclide contamination buried or at the surface?

No. No radionuclide contamination is expected to be present at the site.

PHOTOGRAPHIC DOCUMENTATION

During the site visit(s), photographs should be taken to document the current conditions at the site and to support the information entered in the checklist. For example, photographs may be used to document the following:

- The nature, quality, and distribution of vegetation at the site
- Receptors or evidence of receptors
- Potentially important ecological features, such as ponds and drainage ditches
- Potential exposure pathways
- Any evidence of contamination or impact

SUMMARY OF OBSERVATIONS AND SITE SETTING

Include information on significant source areas and migration pathways that are likely to constitute complete exposure pathways.

Although potentially complete exposure pathways exist (e.g. direct contact with surface soil), significant source areas are not present, as results of the screening assessment (see main text) indicate that detected concentrations of constituents in soil do not generally exceeding relevant ecological screening criteria.

Checklist Completed by William Squire

Affiliation: CB&I Federal Services, LLC.

Author Assisted by William Stanhope, CB&I Federal Services, LLC.

Date: July 3, 2013

REFERENCES

Holloman Air Force Base (HAFB), 2011. *Integrated Natural Resource Management Plan*, February.

Holloman Air Force Base (HAFB), 2007. *Holloman Air Force Base Septic Tanks*, April.

New Mexico Environment Department (NMED), 2012. *Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document*, Hazardous Waste Bureau and Ground Water Quality Bureau, February, Table A-1 updated June 2012.

8/29/2013
Office: HOU
Author: benjamin.good
Reviewer: CLong
Building 924
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Legend
Building 924
NAD 83 SPCS
New Mexico Central
Feet
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330
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Aerial Photography
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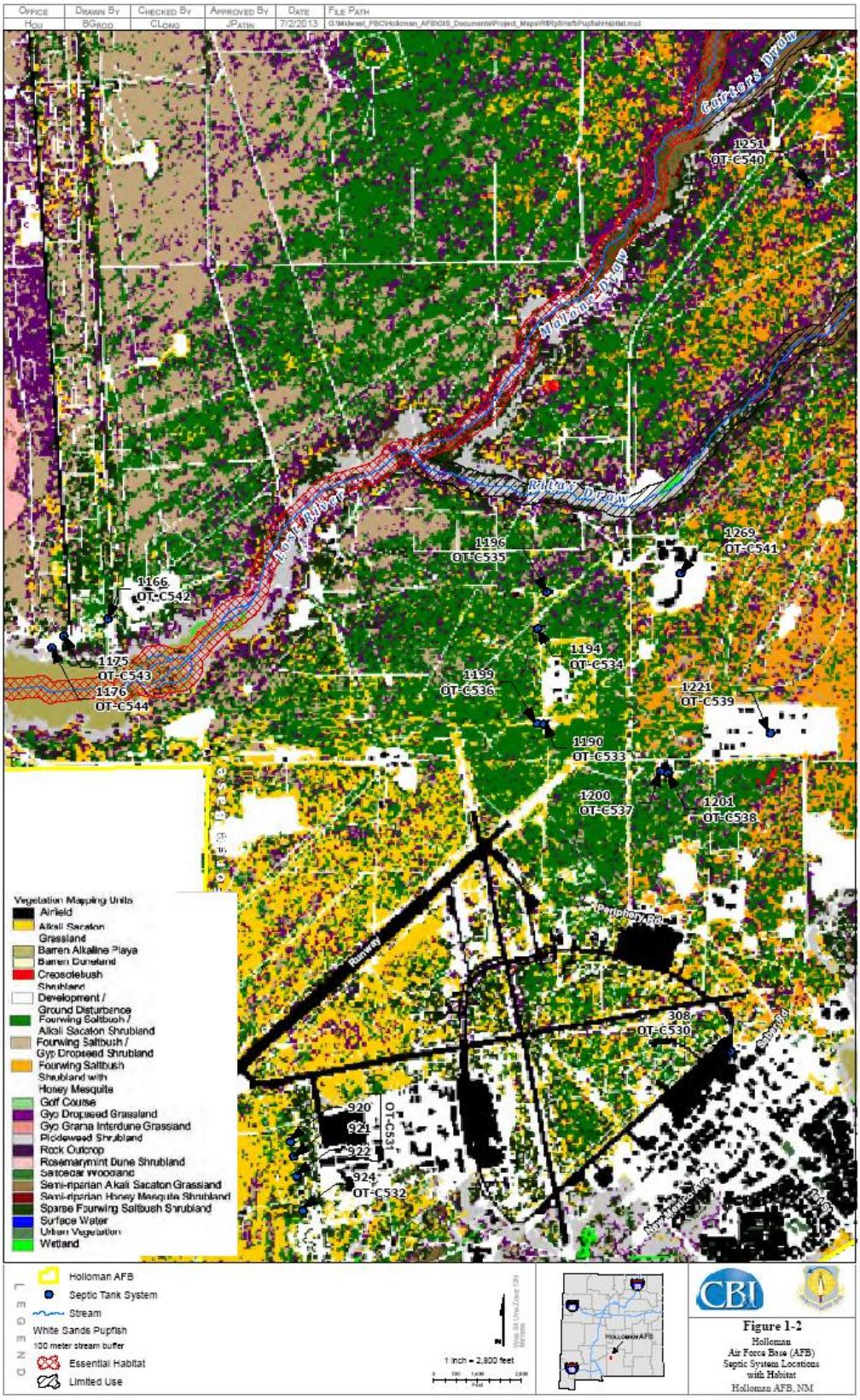
Septic Tank System OT-C532
Holloman AFB, New Mexico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Gardner's Drain
Malone Draw
Rattan Draw
Lost River
1251
OT-C540
1269
OT-C541
1196
OT-C535
1166
OT-C542
1175
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1176
OT-C544
1194
OT-C534
1199
OT-C536
1221
OT-C539
1190
OT-C533
1200
OT-C537
1201
OT-C538
308
OT-C530
920
924
922
924
OT-C531
OT-C532
Peripheral Rd
Runway
Vegetation Mapping Units
Airfield
Alkali Sacaton Grassland
Barren Alkaline Playa
Barren Duneland
Creosotebush Shrubland
Development / Ground Disturbance
Fourwing Saltbush / Alkali Sacaton Shrubland
Fourwing Saltbush / Gyp Dropseed Shrubland
Fourwing Saltbush Shrubland with Honey Mesquite
Golf Course
Gyp Dropseed Grassland
Gyp Grama Interdune Grassland
Pickleweed Shrubland
Rock Outcrop
Rosemarymint Dune Shrubland
Saltcedar Woodland
Semi-riparian Alkali Sacaton Grassland
Semi-riparian Honey Mesquite Shrubland
Sparse Fourwing Saltbush Shrubland
Surface Water
Urban Vegetation
Wetland
Legend
Holloman AFB
Septic Tank System
Stream
White Sands Pupfish
100 meter stream buffer
Essential Habitat
Limited Use
1 inch = 2,800 feet
CBI
Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
with Habitat
Holloman AFB, NM

TABLE 1

EXAMPLES OF SENSITIVE ENVIRONMENTS

National Parks and National Monuments

Designated or Administratively Proposed Federal Wilderness Areas

National Preserves

National or State Wildlife Refuges

National Lakeshore Recreational Areas

Federal land designated for protection of natural ecosystems

State land designated for wildlife or game management

State designated Natural Areas

Federal or state designated Scenic or Wild River

All areas that provide or could potentially provide critical habitat[1] for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern

All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes

All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)

All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)

---

1 Critical habitats are defined by the Endangered Species Act (50 CFR §424.02(d)) as:

> 1) Specific areas within the geographical area currently occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (ii) that may require special management considerations or protection, and 2) Specific areas outside the geographical area occupied by a species at the time it is listed upon a determination by the Secretary [of Interior] that such areas are essential for the conservation of the species.

All areas that provide or could potentially provide habitat for song birds as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-13)

All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)

All areas that provide or could potentially provide habitat for horned toads and Bullfrogs as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, resp.)

All perennial waters (e.g., rivers, lakes, playas, sloughs, ponds, etc)

All ephemeral drainage (e.g., arroyos, puddles/pools, intermittent streams, etc) that provide significant wildlife habitat or that could potentially transport contaminants off site to areas that provide wildlife habitat

All riparian habitats

All perennial and ephemeral wetlands (not limited to jurisdictional wetlands)

All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle.

ATTACHMENT B

ECOLOGICAL SITE EXCLUSION CRITERIA CHECKLIST AND DECISION TREE

1. NEW MEXICO ECOLOGICAL EXCLUSION CRITERIA CHECKLIST

The following questions are designed to be used in conjunction with the Ecological Exclusion Criteria Decision Tree (Figure 1). After answering each question, refer to the Decision Tree to determine the appropriate next step. In some cases, questions will be omitted as the user is directed to another section as indicated by the flow diagram in the Decision Tree. For example, if the user answers "yes" to Question 1 of Section I, he or she is directed to proceed to Section II.

I. Habitat

In the following questions, "affected property" refers to all property on which a release has occurred or is believed to have occurred, including off-site areas where contamination may have occurred or migrated.

1. Are any of the below-listed sensitive environments at, adjacent to, or in the locality1 of the affected property?

   - National Park or National Monument
   - Designated or administratively proposed Federal Wilderness Area
   - National Preserve
   - National or State Wildlife Refuge
   - Federal or State land designated for wildlife or game management
   - State designated Natural Areas
   - All areas that are owned or used by local tribes
   - All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle
   - All areas that provide or could potentially provide habitat for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern
   - All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes
   - All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)
   - All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)
   - All areas that provide or could potentially provide habitat for song birds as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game

1 *Locality* of the site refers to any area where an ecological receptor is likely to contact site-related chemicals. The locality of the site considers the likelihood of contamination migrating over time and places the site in the context of its general surrounding. Therefore, the locality is typically larger than the site and the areas adjacent to the site.

and Fish, 17-2-13)

- All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)
- All areas that provide or could potentially provide habitat for horned toads and bullfrogs as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, respectively)

2. Does the affected property contain land areas which were not listed in Question 1, but could be considered viable ecological habitat? The following are examples (but not a complete listing) of viable ecological habitats:

- Wooded areas
- Shrub/scrub vegetated areas
- Open fields (prairie)
- Other grassy areas
- Desert areas
- Any other areas which support wildlife and/or vegetation, excluding areas which support only opportunistic species (such as house mice, Norway rats, pigeons, etc.) that do not serve as prey to species in adjacent habitats.

The following features are <u>not</u> considered ecologically viable:

- Pavement
- Buildings
- Paved areas of roadways
- Paved/concrete equipment storage pads
- Paved manufacturing or process areas
- Other non-natural surface cover or structure

3. Does the affected property contain any perennial or ephemeral aquatic features which were not listed in Question 1?

II. Receptors

1. Is any part of the affected property used for habitat, foraging area, or refuge by any rare, threatened, or endangered species (plant *or* animal), or otherwise protected species (e.g., raptors, migratory birds)?

2. Is any part of the affected property used for habitat, foraging area, or refuge by any species used as a recreational (e.g., game animals) and/or commercial resource?

3. Is any part of the affected property used for habitat, foraging area, or refuge by any plant or animal species? This includes plants considered "weeds" and opportunistic insect and animal species (such as cockroaches and rats) if they are used as a food source for other species in the area.

III. Exposure Pathways

1. Could receptors be impacted by contaminants via direct contact?

   Is a receptor located in or using an area where it could contact contaminated air, soil3, or surface water?

For Questions 2 and 3, note that one must answer "yes" to all three bullets in order to be directed to the "exclusion denied" box of the decision tree. This is because answering "no" to one of the questions in the bullet list indicates that a complete exposure pathway is not present. For example, in Question 2, if the chemical cannot leach or dissolve to groundwater (bullet 1), there is no chance of ecological receptors being exposed to the chemical through contact with contaminated groundwater. Similarly, the responses to the questions in Question 4 determine whether a complete pathway exists for exposure to NAPL.

2. Could receptors contact contaminants via groundwater?
   - Can the chemical leach or dissolve to groundwater4?
   - Can groundwater mobilize the chemical?
   - Could (does) contaminated groundwater discharge into known or potential receptor habitats?

3. Could receptors contact contaminants via runoff (i.e., surface water and/or suspended sediment) or erosion by water or wind?
   - Are chemicals present in surface soils?
   - Can the chemical be leached from or eroded with surface soils?
   - Is there a receptor habitat located downgradient of the leached/eroded surface soil?

---

3 For soil, this means contamination less than 5 feet below ground surface (bgs).

4 Information on the environmental fate of specific chemicals can be found on the Internet at *http://www.epa.gov/opptintr/chemfact/* or at a local library in published copies of the *Hazardous Substances Data Bank*.

4. Could receptors contact contaminants via migration of non-aqueous phase liquids (NAPL)?

- Is NAPL present at the site?
- Is NAPL migrating toward potential receptors or habitats?
- Could NAPL discharge impact receptors or habitats?

Figure 1 - Ecological Exclusion Criteria Decision Tree

(Refer to corresponding checklist for the full text of each question)

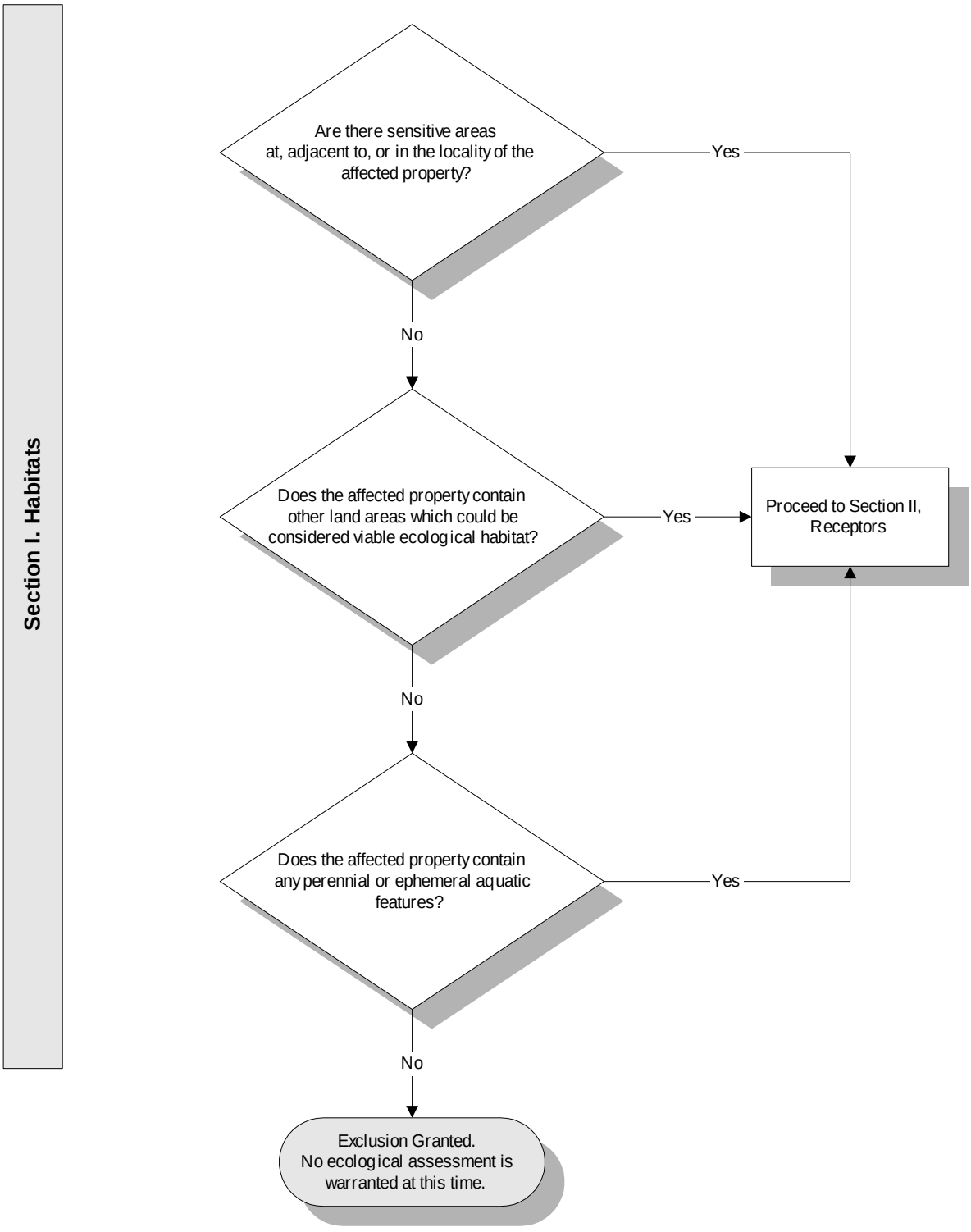

Figure 1 - Exclusion Criteria Decision Tree (continued)

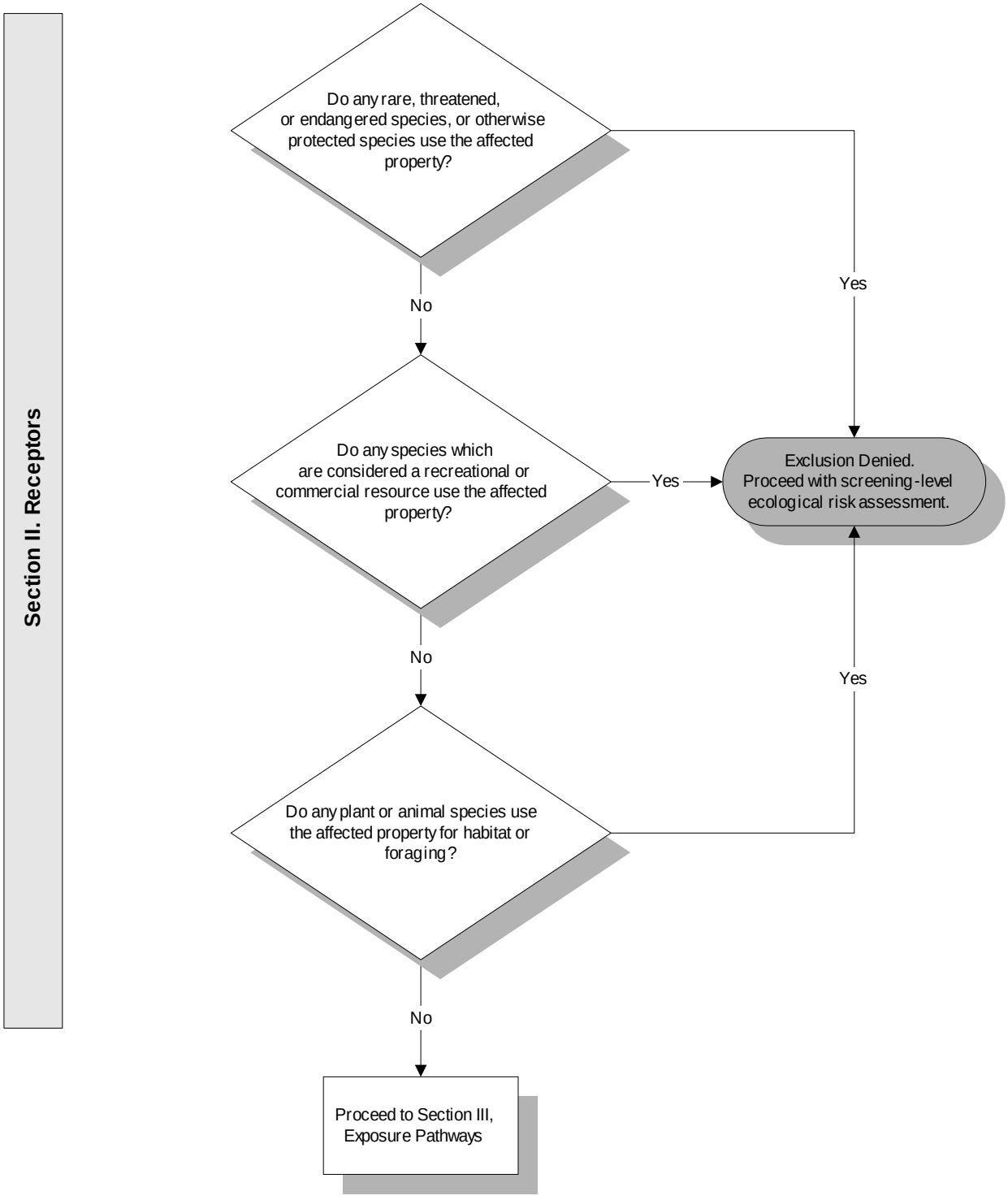

Figure 1 - Exclusion Criteria Decision Tree (continued)

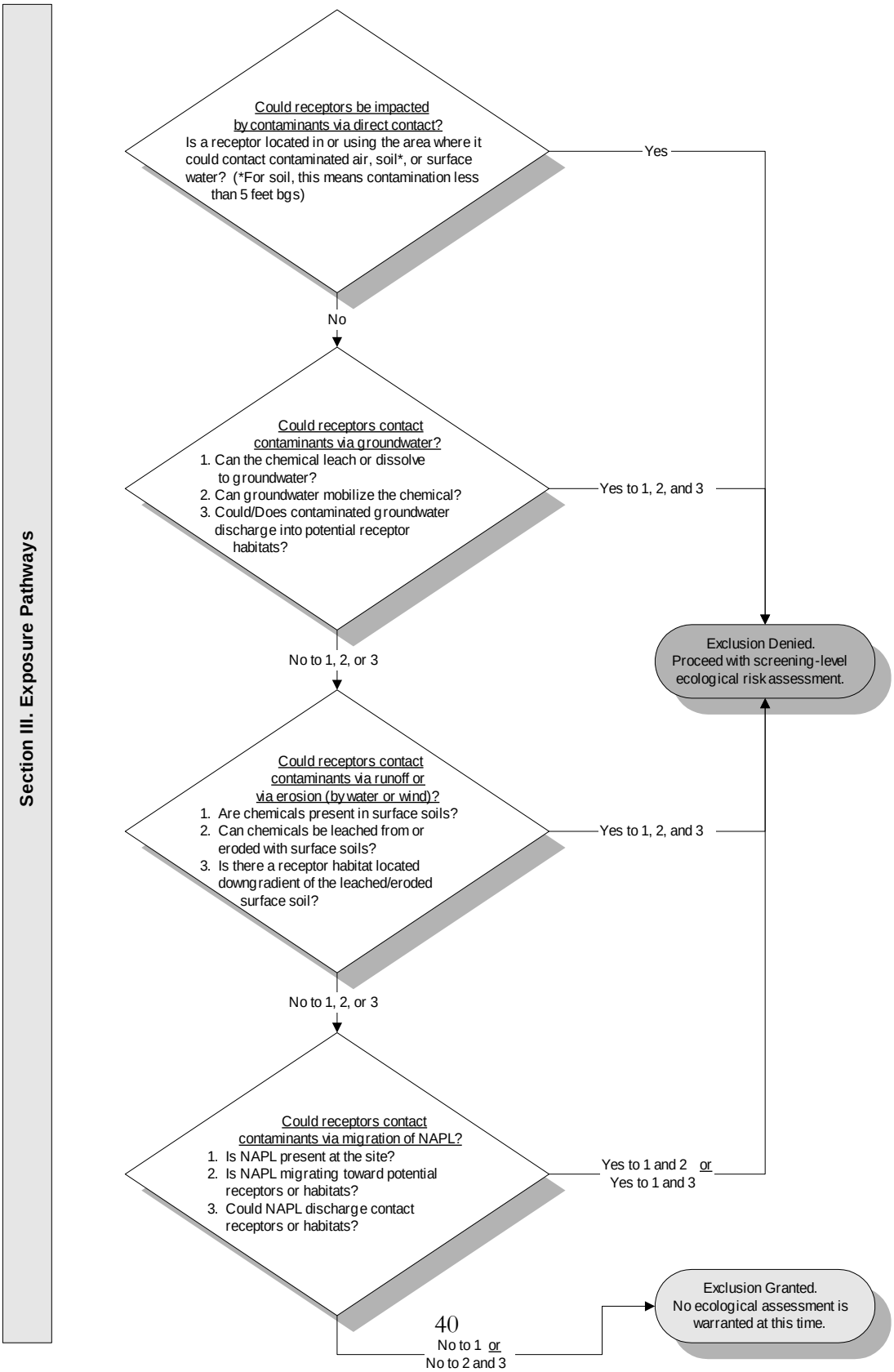

Table A
Soil (0 to 10 ft bgs) Analytical Data Compared to Ecological Screening Values
Building 924 (OT-C532) RFI Report
Holloman Air Force Base, New Mexico

Analyte		Sample Number	OTC532-IS-0001-071612		OTC532-IS-0003-071612		OTC532-IS-0006-071612		OTC532-IS-0008-071612		OTC532-IS-0010-071612		OTC532-IS-0011-071612	
		Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
		Location	Station 1, tank influent		Station 2, septic tank		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field	
		Depth (ft bgs)	3 - 5		7 - 9		3 - 5		3 - 5		0 - 2		9 - 11	
	Background Values - Soil (mg/kg)[a]	LANL (2012)[b] ESLs (mg/kg)	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	**74.5**		**80.9**		**77.3**		**77.8**		**82.1**		**75.6**	
VOLATILES (mg/kg)														
ACETONE	NE	1.2 / 6.3	0.021	U	0.027	U	0.022	U	0.022	U	0.02	U	**0.0181**	J
SEMIVOLATILES (mg/kg)														
BIS(2-ETHYLHEXYL) PHTHALATE	NE	0.02 / 0.2	0.089	U	0.082	U	**0.55**		0.086	U	0.081	U	0.087	U
METALS (mg/kg)														
ALUMINUM	13722	pH Dependent	**1300**		**3270**		**3330**		**688**		**9980**		**1610**	
ARSENIC	3.7	6.8 / 68	1.2	U	1.1	U	1.1	U	1.3	U	**3**	J	1	U
BARIUM	169	110 / 260	**19.5**	J	**32.5**	J	**37.9**	J	**20**	J	**69.6**	J	**18.3**	J
CALCIUM	317332	NSV	**279000**		**206000**		**274000**		**272000**		**196000**		**249000**	
CHROMIUM[c]	25	28 / 280	**0.88**	J	**2.9**	J	**2.5**	J	1.3	U	**8.7**		**1.3**	J
COBALT	7.7	13 / 130	**0.7**	J	**1**	J	**1.3**	J	**0.66**	J	**3.3**	J	**0.58**	J
COPPER	13	15 / 46	**2.2**	J	**2.3**	J	**2.7**	J	**1.7**	J	**8.4**	J	**1.4**	J
IRON	23049	NSV	**994**		**2750**		**2500**		**480**		**10200**		**1760**	
LEAD	10.9	14 / 28	0.62	U	**1.8**	J	**1.3**	J	1.3	U	**6.3**	J	**0.65**	J
MAGNESIUM	16991	NSV	**1930**	J	**2420**	J	**5130**		**4240**		**11500**		**1250**	J
MANGANESE	393	220 / 1,100	**24.8**		**67.4**		**50.5**		**10.6**		**209**		**27.4**	
NICKEL	17.4	9.7 / 19	**1.2**	J	**2.4**	J	**2.4**	J	**1.1**	J	**8.4**	J	**1.1**	J
POTASSIUM	5077	NSV	**460**	J	**953**	J	**1070**	J	**398**	J	**3110**	J	**443**	J
SODIUM	5196	NSV	680	U	580	U	**1280**	J	**1970**	J	**3250**	J	**889**	J
VANADIUM	42.6	0.025 / 0.25	**3.2**	J	**7.5**	J	**9.2**	J	**2.9**	J	**15.3**	J	3.1	J
ZINC	54.6	48 / 480	**3.2**	J	**13.3**		**8.6**	J	6.4	U	**29.2**		**4.3**	J
PETROLEUM HYDROCARBONS (mg/kg)														
DIESEL RANGE ORGANICS C10-C28	NE	NE	4.4	U	4.1	U	4.3	U	4.2	U	**22.6**		4.3	U
OIL RANGE ORGANICS C28-C40	NE	NE	4.4	U	4.1	U	4.3	U	4.2	U	**5.78**	J	4.3	U
CYANIDE (mg/kg)														
CYANIDE	NE	0.1 / 1	0.079	U	0.074	U	0.078	U	0.074	U	0.073	U	**0.087**	J

Table A
Soil (0 to 10 ft bgs) Analytical Data Compared to Ecological Screening Values
Building 924 (OT-C532) RFI Report
Holloman Air Force Base, New Mexico

LANL (2012) ESL values represented as: No Effect ESL / Low-Effect ESL (e.g., 1.2 / 6.3 for acetone)

LANL (2012) ESL Exceeded

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *Los Alamos National Laboratory (LANL), 2012, ECORISK Database, LA-UR-12-24548, Release 3.1, October.*

[c] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
ESL = ecological screening level
HAFB = Holloman Air Force Base
IS = investigative soil (sample)
J = estimated value
LANL = Los Alamos National Laboratory
mg/kg = milligrams per kilogram
NE = not established
NMED = New Mexico Environment Department
NSV = no screening value (available)
RCRA = Resource Recovery and Conservation Act
RFI = RCRA Facility Investigation
U = not detected at the detection limit shown
VQ = validation qualifier

	A	B	C	D	E	F	G	H	I	J	K	L
1				**General UCL Statistics for Data Sets with Non-Detects**								
2		**User Selected Options**										
3		From File		input.wst								
4		Full Precision		OFF								
5		Confidence Coefficient		95%								
6		Number of Bootstrap Operations		2000								
7												
8												
9	**bis(2-Ethylhexyl) phthalate (mg/kg)**											
10												
11						**General Statistics**						
12				Number of Valid Data		6			Number of Detected Data			1
13				Number of Distinct Detected Data		1			Number of Non-Detect Data			5
14									Percent Non-Detects			83.33%
15												
16	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
17	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
18												
19	**The data set for variable bis(2-Ethylhexyl) phthalate (mg/kg) was not processed!**											
20												
21												

CAS	Total	Detects	FOD	Mindet	Maximum concentration of defects	minnd	maxnd	arithmean	arithsd	cvnorm	geomean	geostd	estmnln	eststdln	sw95	swnorm	swln	sf95	sfnorm	sfln	distribution
bis(2-Ethylhexyl) phthalate	6	1	16.67%		0.55	0.081	0.089	0.127083	0.207192	1.63036	0.065086	2.846693	0.112497	0.158599	0.788	0.503	0.529				U

Median	95uclnorm	sdln	h	95uclln	95uclnp	95quantnor	95quantln	95quantnp	utl95norm	utl95ln	quant95np	Units	cohenmnnc	cohenstdno	cohenmnln	cohenstdln	aitchmnnor	aithcstdnor	aitchmnln	aitchstdln	poisspl	Pathway	BootStrapAMQ at	0.95%
0.0865	0.297527	1.046158	4.194022	0.800414	0.55	0.467913	0.363812	0.55	0.895971	3.158965	0.55	mg/kg										4	0.214421	

Final
RCRA Facility Investigation Report
Group 1 – Building 1190 (OT-C533)
Holloman Air Force Base, New Mexico

Prepared for U.S. Air Force Civil Engineer Center
2261 Hughes Ave., Suite 155
Lackland Air Force Base, Texas 78236-9861

Prepared by Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

Contract No. FA8903-09-D-8580
Task Order No. 0013
Project No. 144106
Revision 0
October 2013

Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)

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Acronyms and Abbreviations

AFB	Air Force Base
bgs	below ground surface
COPC	constituent of potential concern
DPT	direct push technology
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
ESL	ecological screening level
ft	foot/feet
GPR	ground-penetrating radar
GRO	gasoline range organics
HI	hazard index
IDW	investigation-derived waste
LANL	Los Alamos National Laboratory
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MCL	maximum contaminant level
MDL	method detection limits
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
ORO	oil range organics
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RSL	Regional Screening Level
Shaw	Shaw Environmental & Infrastructure, Inc. (a CB&I Company)
SLERA	screening-level ecological risk assessment
SSL	soil screening level
SVOC	semivolatile organic compound
TAL	target analyte list
TDS	total dissolved solids
TPH	total petroleum hydrocarbons
UCL	upper confidence limit
VCM	Voluntary Corrective Measure
VOC	volatile organic compound
WQS	water quality standards

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1.0 INTRODUCTION

Shaw Environmental & Infrastructure. Inc. (Shaw), a CB&I company, prepared this Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for the Air Force Civil Engineer Center (formerly the Air Force Center for Engineering and the Environment) under Contract No. FA8903-09-D-8580, Task Order No. 0013, Modification 01. Results presented in this report include those of the facility investigation and the corrective measures performed at the inactive septic tank located at Building 1190 (OT-C533) at Holloman Air Force Base (AFB), New Mexico, which is one of the fifteen Group 1 septic tank sites under the Midwestern Region Performance-Based Remediation Contract. This RFI Report has been prepared pursuant to the requirements of the Holloman AFB Hazardous Waste Facility RCRA Permit No. NM6572124422 (the Permit) (New Mexico Environment Department [NMED], 2004). The purpose of this RFI was to delineate potential contamination that may have been released to the environment from the Building 1190 septic tank system. A Voluntary Corrective Measure (VCM) was performed concurrently with the RFI to remediate and close the inactive septic tank system.

Holloman AFB is situated in south-central New Mexico in the northwest central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). The 15 Group 1 former septic tank sites are located throughout Holloman AFB (Figure 1-2). Each former septic tank is associated with a specific building and is named in reference to the building, along with a numerical identification. As such, the 15 Group 1 septic tank systems are the following: OT-C530 (Building 308), OT-C531 (Buildings 920, 921, and 922), OT-C532 (Building 924), OT-C533 (Building 1190), OT-C534 (Building 1194), OT-C535 (Building 1196), OT-C536 (Building 1199), OT-C537 (Building 1200), OT-C538 (Building 1201), OT-C539 (Building 1221), OT-C540 (Building 1251), OT-C541 (Building 1269), OT-C542 (Building 1166), OT-C543 (Building 1175), and OT-C544 (Building 1176). This report presents a summary of the RFI work conducted at inactive septic tank OT-C533 at Building 1190.

Building 1190 was constructed in 1959 as a 37-foot (ft) by 73-ft structure and was razed in 2002. The dimensions of the septic tank associated with this building were reported to be 9 ft × 4 ft × 8.8 ft, with a nominal capacity of 3,000 gallons. The *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) report in Appendix A provides additional information for Building 1190, including its interior which contained dressing and locker rooms, lavatories, shower stalls, office rooms, a supply room, a shop, and a laboratory. At the time of the RFI fieldwork activities, the status of the Building 1190 septic tank was inactive and in place. The RFI program for Building 1190 included geophysical, soil, and groundwater

investigations, as well as chemical testing and disposal of the septic tank contents, and the in-place abandonment of the septic tank.

1.1 Purpose of the Investigation

Investigative activities were undertaken at Holloman AFB to determine the nature and extent of contamination, and propose recommendations for either closure or additional corrective action, if necessary, at 15 inactive, abandoned, or removed septic tank systems, following the general guidance for closing septic systems found in 20.7.3.307 New Mexico Administrative Code (NMAC) Standards – Abandoned Sewers and On-Site Liquid Waste Systems.

Project quality objectives for each septic tank site consisted of the following:

- Gather and review all site historical information
- Identify septic tank components and historical uses
- Remove septic tank contents and contaminated soil (where necessary), and abandon the tank (where necessary)
- Determine the nature and extent of residual constituents of concern at each site, including potential pathways to groundwater
- Evaluate the risk at each site
- Develop conclusions and recommendations for each site.

This RFI Report presents the data collected to meet these project quality objectives at the Building 1190 septic tank.

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1.2 Scope of Activities

This RFI Report describes all activities associated with the septic tank investigation and remediation performed under the VCM at Building 1190. The activities include soil and groundwater sampling and analysis, risk evaluation, sludge characterization, septic tank abandonment, site restoration, and land surveying. The RFI work was performed in accordance with the *Basewide Septic Tank Solid Waste Management Units RFI Work Plan* (U.S. Army Corps of Engineers [USACE], 2010) and the *Quality Program Plan* (Shaw, 2012a). The *Quality Program Plan* (Shaw, 2012a) contains the Site Safety and Health Plan; the Uniform Federal Policy – Sampling and Analysis Plan/Quality Assurance Project Plan; and the Construction Quality Plan, which defines the methodology and practices that were used to control construction work during the performance of the RFI. The septic tank abandonment work was conducted in accordance with the Group 1 *Final*

Voluntary Corrective Measures Request – Septic Tank Sites (Shaw, 2012b) work plan, as well as the aforementioned project control documents.

1.3 Regulatory Setting

The Permit establishes the general and specific standards and activities for managing hazardous waste pursuant to Subtitle C of RCRA, the New Mexico Hazardous Waste Act, and the New Mexico Hazardous Waste Management Regulations. The Permit also sets forth requirements for investigation, notification, corrective action, and reporting for the storage, management, and release of hazardous wastes.

The 15 septic systems were either inactive or previously removed, as indicated in *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) (Appendix A**)**, and were not listed in the Permit. The Holloman AFB *RFI Work Plan* (USACE, 2010) was approved by NMED in a letter dated January 13, 2010 (NMED, 2010). The NMED-approved *RFI Work Plan* (USACE, 2010) contained investigation activities only; therefore Shaw submitted the Group 1 *VCM Request* (Shaw, 2012b) to include remediation and closure tasks that addressed septic system abandonment using 20.7.3.307 NMAC (Abandoned Sewers and On-Site Liquid Waste Systems). NMED has primary regulatory responsibility for the septic system sites; therefore, corrective action must be performed under Title 20 NMAC.

The septic tank investigation was based on action/cleanup levels stipulated in Appendix 4-F of the Permit to be protective of human health and the environment. Permit Appendix 4-F specifies that soil contaminant concentrations be compared with the NMED residential soil screening levels (SSL), as presented in the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a), or the U.S. Environmental Protection Agency (EPA) residential Regional Screening Levels (RSL) as presented in the *U.S. Environmental Protection Agency (EPA) Regions 3, 6, and 9 Regional Screening Levels for Chemical Contaminants at Superfund Sites* (EPA, 2012a), if no NMED SSL has been established. Holloman AFB also has NMED-approved background concentrations for metals in soil (NMED, 2012b).

Regarding groundwater, the Permit specifies that the more stringent of either the New Mexico Water Quality Control Commission (NMWQCC) water quality standards (WQS) (20.6.2 NMAC), or the EPA maximum contaminant levels (MCL) for drinking water, be used for comparison with measured sample concentrations (EPA, 2012b).

1.4 RFI Report Organization

This RFI Report is organized into the following sections:

- **Section 1.0 – Introduction**: identifies the objectives and purpose of the report.

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- **Section 2.0 – Environmental Setting**: provides pertinent descriptions of history, location, physiography, topography, surface water, hydrology, regional geology, soil types, regional hydrogeology, climate, current and future land use, and current and future water use for Holloman AFB.

- **Section 3.0 – Source Characterization**: describes the RFI data collection techniques, sampling locations, and analytical methods for samples collected, and presents a summary of the activities associated with the septic tank abandonment.

- **Section 4.0 – Investigation Results and Evaluation**: presents the soil and groundwater analytical results, summarizes the geochemical evaluation, and provides the results of the human health risk and ecological evaluations.

- **Section 5.0 – Data Quality Assurance and Data Quality Control Review**: summarizes the data validation results.

- **Section 6.0 – Conclusions and Recommendations**: presents the conclusions and recommendations for this RFI report.

- **Section 7.0 – References**: lists the references cited in this report.

In addition to the figures and tables listed in the table of contents, the following appendices are included in this report:

- **Appendix A** – Historical Records
- **Appendix B** – Photographic Log
- **Appendix C** – Geophysical Report
- **Appendix D** – Sample Collection Logs
- **Appendix E** – Boring Logs
- **Appendix F** – Well Construction Diagram
- **Appendix G** – Well Purge Record
- **Appendix H** – NMED On-Site Liquid Waste System Abandonment Form
- **Appendix I** – Site Survey Data
- **Appendix J** – Laboratory Analytical Data and Data Validation Checklists
- **Appendix K** – Waste Manifests
- **Appendix L** – Geochemical Evaluation of Arsenic in Soil
- **Appendix M** – Risk Evaluation Calculations
- **Appendix N** – Ecological Evaluation.

2.0 ENVIRONMENTAL SETTING

This section provides background information for Holloman AFB including physical setting, history, topography, climate, soils, geology, hydrology, and land and water use.

2.1 Physical Setting

Holloman AFB is situated in south-central New Mexico, in the northwest-central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). Holloman AFB has a population of 6,000, and occupies 59,639 acres in the northeast quarter of Section 1, Township 17 South, Range 8 East. The White Sands Missile Range testing facilities occupy additional land extending northward from the base. Privately- and publicly-owned lands border the remainder of Holloman AFB. The major highway servicing Holloman AFB is Highway 70, which runs southwest from the town of Alamogordo, New Mexico, and separates Holloman AFB from publicly owned lands to the south. Alamogordo, New Mexico, which has a population of 30,401 according to the 2010 U.S. Census, is located approximately 7 miles east of the base.

2.2 Holloman Air Force Base History

Holloman AFB was first established in 1942 as Alamogordo Army Air Field. From 1942 through 1945, Alamogordo Army Air Field served as the training grounds for over 20 different flight groups, flying primarily B-17s, B-24s, and B-29s. After World War II, most operations had ceased at the base. In 1947, Air Material Command announced the air field would be its primary site for the testing and development of unmanned aircraft, guided missiles, and other research programs. On January 13, 1948, the Alamogordo installation was renamed in honor of the late Colonel George V. Holloman, a pioneer in guided missile research. In 1968, the 49th Tactical Fighter Wing arrived at Holloman AFB, and has remained since. Today, Holloman AFB also serves as the training center for the German Air Force's Tactical Training Center.

2.3 Physiography and Topography

Holloman AFB is located within the Sacramento Mountains physiographic province on the western edge of the Sacramento Mountains. The base is at a mean elevation of 4,093 ft above mean sea level. The region is characterized by high tablelands with rolling summit plains; cuesta-formed mountains dipping eastward; and west-facing escarpments, with the wide bracketed basin forming the basin and range complex. Holloman AFB is located in the Tularosa Basin, which is part of the Central Closed Basins. The bordering mountains rise abruptly to altitudes of 7,000 to 12,000 ft above mean sea level. The San Andres Mountains bound the basin to the west (approximately 30 miles) with the Sacramento Mountains

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approximately 10 miles to the east (Figure 2-1). At its widest, the basin is approximately 60 miles east to west, and stretches approximately 150 miles north to south.

2.4 Climate

As a whole, New Mexico has a mild, arid to semiarid continental climate characterized by light precipitation totals, abundant sunshine, relatively low humidity, and relatively large annual and diurnal temperature ranges (Western Regional Climate Center, 2013). The climate of the Central Closed Basins varies with elevation. The base is located in the low areas and is characterized by warm temperatures and dry air. Daytime temperatures often exceed 100 degrees Fahrenheit in the summer months, and are in the middle 50s (degrees Fahrenheit) in the winter. A preponderance of clear skies and relatively low humidity permits rapid nighttime cooling resulting in average diurnal temperature ranges of 25 to 35 degrees Fahrenheit. Potential evapotranspiration, at 67 inches per year, significantly exceeds annual precipitation, usually less than 15 inches. Arid conditions resulting from very low rainfall amounts, coupled with the topographically induced wind patterns combining with the sparse vegetation, tend to cause localized "dust devils." The annual rainfall for Alamogordo, New Mexico is 12 inches per year. Much of the precipitation falls during the midsummer monsoonal period (July and August) as brief, yet frequent, intense thunderstorms culminating in 30 to 40 percent of the total annual rainfall.

2.5 Regional Geology and Soils

2.5.1 Geology

The sedimentary rocks that make up the adjacent mountain ranges are between 250 and 500 million years old (New Mexico Bureau of Geology and Mineral Resources, 2012). During the period when the area was submerged beneath the shallow intracontinental sea, the layers of limestone, shale, gypsum, and sandstone were formed. In time, these layers were pushed upward through various tectonic forces forming a large bulge on the surface. Approximately 10 million years ago, the center began to subside resulting in a vertical drop of thousands of ft, leaving the edges still standing (the present-day Sacramento and San Andres mountain ranges). In the millions of years following, rainfall, snowmelt, and wind eroded the mountain sediments depositing them in the valley (i.e., Tularosa Basin). Water carrying eroded limestone, dolomite, gravel, and other materials continue to flow into the basin.

As the Tularosa Basin is a bolson, which is a basin with no surface drainage outlet, sediments carried by surface water into a closed basin are bolson deposits. The overlying alluvium generally consists of unconsolidated gravels, sands, and clays. Soils in the basin are derived from the adjacent ranges as erosional deposits of limestone, dolomite, and gypsum. A fining sequence from the ranges towards the basin's center characterizes the area with the near-

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surface soils as alluvial, eolian, and lacustrine deposits. The alluvial fan deposits are laterally discontinuous units of interbedded sand, silt, and clay while the eolian deposits consist primarily of gypsum sands. The eolian and alluvial deposits are usually indistinguishable due to the reworking of the alluvial sediment by eolian processes. The playa, or lacustrine deposits, consist of clay containing gypsum and are contiguous with the alluvial fan and eolian deposits throughout the base. Stiff caliche layers, varying thickness, have been identified at different areas of the base.

2.5.2 Soils

The U.S. Natural Resources Conservation Service (formerly the Soil Conservation Service) has identified two soil associations in the vicinity of Holloman AFB: (1) the Holloman-Gypsum Land-Yesum Complex, and (2) the Mead silty clay loam (Figure 2-2) (U.S. Department of Agriculture, 1981). The permeability of these horizons ranges from 4×10^{-4} to 1×10^{-3} centimeters per second.

The Holloman-Gypsum Land-Yesum Complex, 0 to 5 percent sloped soil, consists of larger areas of shallow and deep, well-drained soils and areas of exposed gypsum. The Holloman soil makes up approximately 35 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 13 inches of the substratum is pink, very fine sandy loam that is very high in gypsum. Below that, the substratum is white gypsum to a depth of more than 60 inches. This soil is calcareous and mildly alkaline to moderately alkaline. Permeability is moderate. Available water capacity is very low.

Gypsum Land makes up approximately 30 percent of the Holloman-Gypsum Land-Yesum Complex (0 to 5 percent slopes). Typically, less than 1 inch of very fine sandy loam overlies soft to hard, white gypsum. The deep Yesum consists of very fine sandy loam that makes up approximately 20 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 9 inches of the substratum is light brown, fine sandy loam that is very high in gypsum. Below that, the substratum is pink, very fine sandy loam to a depth of more than 60 inches. The soil is calcareous throughout, and is mildly alkaline. Permeability is moderate. Available water capacity is moderate. Many fine gypsum crystals are found throughout the profile.

The soil type found across the main drainage area for the installation is Mead silty clay loam, 0 to 1 percent slopes. This deep, poorly drained, nearly level soil is on outer fringes of alluvial fans. This soil formed in fine textured alluvium over lacustrine lake sediment. It is very high in salt content because of periodic flooding and poor drainage. Slopes are smooth and concave. Typically, the surface layer is reddish brown, silty clay loam, and clay loam approximately 5 inches thick. The substratum, to a depth of 48 inches, is light reddish brown

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clay that has a high content of salt. Below that, the substratum is lacustrine material of variable texture and color to a depth of more than 60 inches. Included within this soil are areas of Holloman soils and Gypsum Land along the margins of the unit of steep, short gully sides and knolls. These inclusions make up approximately 15 percent of the map unit for this soil type. Individual areas are generally smaller than 10 acres. This soil is moderately calcareous throughout and is moderately to strongly alkaline. It has a layer of salt that is more soluble than gypsum. Permeability is very low. Available water capacity is low (USACE, 2010).

2.6 Regional Hydrogeology

Groundwater occurs as an unconfined aquifer in the unconsolidated deposits of the central basin, with the primary source of recharge as rainfall percolation and minor amounts of stream runoff along the western edge of the Sacramento Mountains. Surface water/rainfall migrates downward into the alluvial sediments at the edge of the shallow aquifer near the ranges and flows through progressively finer-grained sediments towards the central basin. Because the Tularosa Basin is a closed system, water that enters the area leaves either through evaporation or percolation. This elevated amount of percolation results in a fairly high water table. Beneath Holloman AFB, groundwater ranges from 5 to 50 ft below ground surface (bgs). Flow for the base is generally towards the southwest with localized influences from the variations in the topography of the base (Figure 2-3). In the northern and western portions of the base, groundwater flows more to the west towards the Ritas Draw, Malone Draw, and Lost River drainages. Groundwater flow is affected by local topography in areas immediately adjacent to arroyos, where groundwater flows directly toward the drainages regardless of the regional flow pattern.

Groundwater in the Tularosa Basin is of potable quality at the recharge areas in close proximity to the Sacramento Mountains and becomes increasingly mineralized toward the central portion of the basin and discharge areas. The majority (over 70 percent) of the Environmental Restoration Program sites located across Holloman AFB have groundwater monitoring wells containing water with an average total dissolved solids (TDS) concentration greater than 10,000 milligrams per liter (mg/L). These TDS data support the hypothesis that TDS concentrations below 10,000 mg/L at Holloman AFB are caused by dilution of natural groundwater quality from leaking water lines and surface irrigation from the domestic water supply. TDS concentrations greater than 10,000 mg/L exceed the NMWQCC limit as potable water (20.6.2 NMAC), and thus, the groundwater beneath Holloman AFB has been designated as unfit for human consumption. Likewise, the EPA guidelines have identified the groundwater as a Class IIIB water source, characterized by TDS concentrations exceeding 10,000 mg/L, and is characterized by a low degree of interconnection with adjacent surface water or groundwater of a higher class. Groundwater

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does not discharge or connect to any adjacent aquifers, because the Tularosa Basin is a closed basin. Adjacent surface waters include Lost River and Lake Holloman, which also have high concentrations of TDS, and are not considered potential drinking water sources.

2.7 Surface Water and Hydrology

The Tularosa Basin contains all of the surface flow in its boundaries. The nearest inflow of surface waters to Holloman AFB comes from the Lost River, located in the north-central region of the base. The upper reaches of the Three Rivers and the Sacramento River are perennial in the basin. Holloman AFB is dissected by several southwest-trending arroyos that control the surface drainage. Hay Draw arroyo is located in the far north. Malone and Ritas Draws, which drain into the Lost River and Dillard Draw arroyos, are located along the eastern perimeter of the base. Approximately 10,000 years ago, indications are that a much wetter climate existed. The present-day Lake Otero encompassed a much larger area, possibly upwards of several hundred square miles. Its remains are the Alkali Flat and Lake Lucero. Lake Lucero is a temporary feature of merely a few inches in depth during the rainy season.

Ancient lakes and streams deposited water-bearing deposits over the older bedrock basement materials. Fractures, cracks, and fissures in the Permian and Pennsylvanian bedrock yield small quantities of relatively good-quality water in the deeper peripheral. Potable water is only found from wells near the edges of the basin, with more saline water towards the center. Two of the principal sources of potable water are: (1) a long narrow area on the upslope sides of Tularosa and Alamogordo, and (2) in the far southwestern part of the basin. A portion of the city of Alamogordo's water, as well as Holloman AFB's water, is supplied from Bonito Lake (which is in the Pecos River Basin).

2.8 Current and Future Land Use

The land surrounding Holloman AFB consists of residential areas to the east and northeast (city of Alamogordo, New Mexico), rangeland to the south, the White Sands National Monument to the west, and areas where military activities are conducted to the north. The desert terrain of the area immediately surrounding Holloman AFB has limited development, and there are no agricultural operations, residential communities, or large industrial operations located adjacent to the base. The Boles Well Field, a freshwater source for Holloman AFB, is located approximately 6 miles to the southeast of the base. Holloman AFB is an active military installation and is expected to remain active for the foreseeable future. No transfer of military property to the public is anticipated, and public access to the base is restricted. Future land use is not expected to differ significantly from current land use practices (Foster Wheeler Environmental Corporation, 2002).

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2.9 Current and Future Water Use

At present, Holloman AFB receives approximately 50 percent of its freshwater supply from the Boles Well Field. An additional freshwater resource for Holloman AFB, and for the city of Alamogordo, is Bonito Lake, located 60 miles northeast of the Tularosa Basin. Currently, there are no potable supplies of groundwater or surface water located on the base because of poor groundwater quality with TDS concentrations greater than 10,000 mg/L.

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3.0 SOURCE CHARACTERIZATION

This section presents the overall technical approach in general accordance with the *RFI Work Plan* (USACE, 2010) (except where otherwise noted), and details the investigative and remediation activities that were implemented at Building 1190.

The primary environmental media of concern at Building 1190 are soil and groundwater. The extent of contamination in soil was expected to be relatively local to the inactive septic tank location. Therefore, the basic approach was to identify the former septic tank location and then sample at the individual features of the septic tank system in characterizing the soil. To evaluate the potential impacts to groundwater, a monitoring well was installed on the downgradient end of the leach field. The analytical programs for both soil and groundwater focused on the expected nature of contamination likely to be associated with septic tank contents.

The RFI conducted at the inactive septic tank OT-C533 (Building 1190) was initiated as part of the Midwestern Region Performance-Based Remediation Contract. The *RFI Work Plan* (USACE, 2010) for this site includes the following field work activities: pre-mobilization, mobilization, and site setup activities (under which a geophysical investigation was performed); soil boring advancement; soil sample collection and analysis; monitoring well installation and development; groundwater sampling and analysis; investigation-derived waste (IDW) management; and land surveying. Site activities performed concurrently under the VCM, and in accordance with the *VCM Request* work plan (Shaw, 2012b), included: septic tank contents (sludge) sampling and analysis, septic tank sludge removal and disposal, septic tank bottom puncturing, confirmatory soil sampling, concrete vault collapsing, backfilling, and site restoration. Appendix B provides a photographic log of the Building 1190 septic tank investigation and abandonment activities.

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3.1 Pre-mobilization and Mobilization Activities

As a part of the premobilization and mobilization phase of the work, the following pre-investigation documents were filed and approvals obtained:

- Civil Engineer Work Request (Air Force Form 332) approval
- Base digging permits (Air Force Form 103, Base Civil Engineering Work Clearance Request) with utility clearances
- Site security clearances
- Facility manager notification of the intended operations.

Before the start of site work activities, a pre-investigation kick-off meeting and site walk-through were conducted with the Air Force Civil Engineer Center resident engineer, Holloman AFB personnel, and Shaw's Construction Manager. These meetings facilitated planning for equipment access, equipment staging, decontamination area layout, potential site hazards, emergency evacuation routes, and project schedule.

Prior to submittal of the digging permits, the drilling locations were delineated using marker flags, stakes, and paint. Utility clearance approvals were completed by the appropriate Holloman AFB utility office (i.e., telephone, sewer, water, natural gas, etc.), and by the New Mexico One Call utility clearance system. Upon receipt of the approved digging permit and utility clearances, Shaw's Construction Manager completed a site walk-through to confirm the utility and intrusive work locations. In addition, Shaw performed a site survey prior to the start of drilling activities to become more familiar with the site layout, buried and overhead utility locations, and to search for any other potentially buried utilities.

3.2 Geophysical Investigation

A geophysical investigation was performed at Building 1190 to locate the position and to define the limits of the inactive septic system. Methods employed included: visual inspection, electromagnetic induction conductivity detection, ground-penetrating radar (GPR), and electromagnetic pipe and cable location.

Electromagnetic induction conductivity detection ground induction methods are employed to detect broad metal mass anomalies or conductive zones that may be indicative of potential septic tanks, and lateral changes in conductive zones of soil or backfill materials relative to native soil. GPR is used to detect inactive septic tank excavation sidewalls and fill areas. An electromagnetic pipe and cable survey was conducted to detect buried utility lines.

Electromagnetic and GPR surveys were conducted at Building 1190 on June 14, 2012. The location of the inactive septic tank was identified, approximately 60 ft southeast of Building 1190. Underground utility lines, the septic tank influent line, the septic tank effluent line, and the septic tank leach field were also delineated for later reference during soil boring activities. The locations of the individual leach field piping could not be directly detected by the geophysical survey due to the similarity of composition of the clay pipes and the surrounding soil. However, the leach field could be identified by the geophysical survey equipment due to the differences in mineralization and conductivity between the native soil and the soils that were physically affected by normal leach field operation. The presence of the leach field piping was assumed within the leach field as identified by the geophysical survey which allowed for representative soil and groundwater sample collection. Geophysical findings are shown on Figure 3-1. The complete geophysical report is included in Appendix C.

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3.3 Soil Investigation

The soil investigation of the septic tank system at Building 1190 was conducted on June 25, 2012. The program consisted of sampling four borings advanced at the former septic tank system locations as shown on Figure 3-1. Soil boring OTC533-Station 1 (sample numbers OTC533-IS-0001-062512 and OTC533-IS-0002-062512) was placed north of the abandoned septic tank adjacent to the influent line, soil boring OTC533-Station 2 (sample numbers OTC533-IS-0003-062512 and OTC533-IS-0004-062512) was placed at the abandoned septic tank location, soil boring OTC533-Station 3 (samples numbers OTC533-IS-0005-062512, OTC533-IS-0006-062512, and OTC533-IS-0007-062512-FD) was placed south of the abandoned septic tank adjacent to the expected location of the effluent line, and soil boring OTC533-Station 4 (sample numbers OTC533-IS-0008-062512, OTC533-IS-0009-062512, OTC533-IS-0010-062512, and OTC533-IS-0011-062512) was placed on the downgradient side of the leach field of the abandoned septic tank. Table 3-1 presents a summary of samples collected during the RFI and VCM activities.

The borings were advanced using direct push technology (DPT), with soil samples collected at the following depth intervals: 3.0 to 5.0 ft bgs and 10.0 to 12.0 ft bgs at OTC533-Station 1; 10.0 to 12.0 ft bgs and 17.0 to 19.0 ft bgs at OTC533-Station 2; 3.0 to 5.0 ft bgs and 10.0 to 12.0 ft bgs (plus a field duplicate sample from the 10.0 to 12.0 ft bgs depth interval) at OTC533-Station 3; and 0.0 to 2.0 ft bgs, 3.0 to 5.0 ft bgs, 10.0 to 12.0 ft bgs, and 23.0 to 25.0 ft bgs at OTC533-Station 4 (Note that OTC533-Station 4 is the location of monitoring well OTC533-MW01). Appendix D contains copies of the sample collection logs.

Soil samples were logged in the field in accordance with the Unified Soil Classification System requirements, and sample depths were in general accordance with the *RFI Work Plan* (USACE, 2010). Soil samples were not screened with a photoionization detector since there was no sensory evidence of contamination. Appendix E contains copies of the soil boring logs.

Soil samples for volatile organic compound (VOC) analysis were collected in accordance with EPA Method 5035, using a TerraCore® Sampler device (EPA, 1986), while non-VOC sample aliquots were placed in laboratory-provided containers. Samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), explosives, polychlorinated biphenyls (PCBs), target analyte list (TAL) metals, total petroleum hydrocarbons (TPH)-gasoline range organics (GRO), TPH-diesel range organics (DRO), TPH-oil range organics (ORO), total cyanide, percent solids, and tritium by Accutest Laboratories, Inc., a National Environmental Laboratory Accreditation Program-accredited laboratory, using EPA analytical methods, as summarized in Table 3-1.

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The excess sample core soil extracted using the DPT drilling method was placed in 55-gallon drums for later characterization and transport to a licensed disposal facility. The boreholes were abandoned upon completion by plugging from the bottom of the borehole to ground surface using bentonite pellets. Soil boring equipment was decontaminated between borings as detailed in Holloman AFB Standard Operating Procedure 2, "Sampling Equipment Decontamination" as provided in Appendix B of the *RFI Work Plan* (USACE, 2010) and Shaw's Standard Operating Procedure No. EI-FS-014, "Decontamination of Contact Sampling Equipment."

3.4 Groundwater Investigation

One monitoring well was installed at Building 1190 determine impact to groundwater via the septic tank system. On June 26, 2012, monitoring well OTC533-MW01 was installed in a downgradient position within the leach field and approximately 80 ft southwest of the septic tank location, as shown on Figure 3-1.

The monitoring well was installed using hollow-stem auger drilling techniques in accordance with NMED Ground Water Quality Bureau *Monitoring Well Construction and Abandonment Guidelines* (NMED, 2011). The 10-inch borehole was advanced approximately 9 ft into the water table at approximately 25 ft bgs and completed such that the top of the well screen was set above the approximate level of the groundwater observed during drilling. The monitoring well was constructed of 2-inch-diameter Schedule-40 polyvinyl chloride riser with 2-inch diameter, Schedule-40 polyvinyl chloride screen fitted with pre-packed, very fine stainless-steel meshing (Appendix F). The screened section of the well was 10 ft in length. A silica sand filter pack was placed around the screen to 2 ft above the top of the screen, with a 2-ft thick bentonite seal placed above the filter pack (as measured dry prior to hydrating the bentonite). The remaining annular space was grouted to ground surface with a cement/bentonite grout mixture.

The monitoring well was constructed as a "flush-mount" surface completion with a water-tight well vault, locking, expandable well plug, and finished to surrounding grade. Table 3-2 and Appendix F provide monitoring well construction details.

The newly-installed monitoring well was developed using surging and pumping techniques to create an effective filter pack around the well screen, remove fine particles from the formation near the borehole, and assist in restoring the natural water quality of the aquifer in the vicinity of the well.

Information recorded during well development included water-level measurements, depth-to-bottom measurements, water-quality parameters (pH, temperature, and specific

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conductance), discharge-water color, water volume, and time period. Well development was performed until the following criteria were met:

- Water removed from the well was visually clear, and the final turbidity measurement was less than 10 nephelometric turbidity units.
- The pH, temperature, and specific conductance parameters were stabilized (less than 10 percent variation for three successive readings).

Groundwater sampling was conducted at OTC533-MW01 on July 4, 2012 using low-flow sampling techniques. Water quality indicator parameters were measured and recorded during purging of the monitoring well using a field-calibrated water quality meter. A copy of the well purge record is provided in Appendix G. Table 3-3 contains final water quality readings from the sampling event. Groundwater samples were collected once indicator parameters stabilized and were analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium by Accutest Laboratories, Inc.

3.5 Septic Tank Sludge Removal and Tank Abandonment

The inactive septic tank consisted of a 9 ft by 4 ft by 8.8 ft concrete box with baffles as shown in the photographic log in Appendix B. On September 24 and 25, 2012, the concrete septic tank was abandoned in place in accordance with 20.7.3.307 NMAC. The concrete lid was removed from the top of the concrete box and demolished and all solid material (dry sludge) was removed from the tank. A sludge sample (OTC533-SL-0001-062712) was previously collected on June 27, 2012 for characterization, following the completion of the RFI sampling activities. In addition, a waste characterization sample (OTC533-WC-0001-072512) was collected specifically for the disposal of the sludge. Upon removal from the septic tank, the dry sludge was temporarily stored in a roll-off container, characterized, and properly disposed at Otero/Greentree Regional Landfill, a permitted waste facility, located in Alamogordo, New Mexico.

The bottom of the tank was then punctured using a rubber-tired backhoe equipped with a hammer tool. The tank bottom demolition was completed in accordance with 20.7.3.307 NMAC, which requires that the septic tank be abandoned by punching a hole in the floor of the tank to prevent the tank from holding water.

Two confirmatory samples were collected from the intervals 0.0 to 0.5 ft (sample OTC533-CS-0001-092612) and 4.5 to 5.0 ft (sample OTC533-CS-0002-092612) below the base of the septic tank. The confirmatory samples were analyzed for VOCs, SVOCs, PCBs, TPH-GRO, and tritium (metals analyses were inadvertently not run for these samples) by Accutest Laboratories, Inc., using EPA analytical methods, as summarized in Table 3-1.

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Following soil sampling, the concrete baffles and walls of the tank were demolished and pushed into the tank. The tank excavation was backfilled with clean-fill from the Holloman AFB on-base borrow source and compacted using a track-mounted excavator. The area was final-graded to match the existing ground surface. A copy of the NMED On-Site Liquid Waste System Abandonment form is provided in Appendix H.

3.6 Investigation-Derived Waste

The nonhazardous IDW generated during the RFI at Building 1190 (OT-C533) was segregated into the following categories:

- Soil – drill cuttings soil and septic tank sludge
- Water – decontamination and monitoring well purge liquids.

Upon generation, IDW was properly containerized and temporarily stored at the designated laydown yard, as specified by Holloman AFB. Wastes were contained in sealed, U.S. Department of Transportation–approved, steel 55-gallon drums (for drill cuttings, sludge, decontamination water, and purge water). The waste soil drums were emptied into 20-cubic yard roll-off containers, and the wastewater was pumped into a 1,400-gallon plastic tank prior to characterization sampling and analysis for disposal. The results of the IDW sampling are discussed in Section 4.3.

3.7 Site Surveying

Soil borings, the monitoring well, and other site features shown on Figure 3-1, were surveyed by Albuquerque Surveying Company, Inc. from Albuquerque, New Mexico, a state-licensed surveyor.

Horizontal coordinates are referenced to the North American Datum 1983 State Plane Coordinate System, New Mexico-Central, and surveyed to an accuracy of $\pm$1.0 ft. Vertical elevations are referenced to the North American Vertical Datum 1988 coordinate system to an accuracy of $\pm$0.01 ft. A copy of the site survey results is presented in Appendix I.

3.8 Decontamination Procedures

A decontamination pad was constructed at the designated laydown area for decontamination of all downhole drilling equipment. The drilling rig was decontaminated prior to entering the site. Drilling equipment that came into contact with the borehole was decontaminated by hot-water pressure washing. Disposable equipment used for soil sample collection did not require decontamination.

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4.0 INVESTIGATION RESULTS AND EVALUATION

This section presents the results and evaluation of the RFI soil and groundwater sampling and includes the results of the characterization and confirmatory samples associated with the septic tank abandonment.

4.1 Soil Analytical Results

4.1.1 RFI Soil Sampling Results

Eleven soil boring samples (including one field duplicate sample) were collected during the RFI at the locations shown on Figure 3-1. The soil samples were sent to Accutest Laboratories, Inc., for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, total cyanide, percent solids, and tritium analyses. Analytical results for the soil samples are presented in Table 4-1. Laboratory analytical data packages, and the data validation checklists for the soil sample data, are provided in Appendix J.

The analytical results for metals in Table 4-1 show that Holloman AFB soil samples contain significant amounts of calcium, typically greater than 100,000 milligrams per kilogram (mg/kg) (10 percent), and can be as high as 250,000 mg/kg (25 percent). Calcium at these levels contributes spectral interferences during inductively-coupled plasma metals analysis, and can also clog the nebulizer that is used to introduce the sample. Sample dilution is the recommended method for solving both the spectral interference issue and the nebulizer clogging issue. However, sample dilution raises the analytical method detection limits (MDL) for all associated metals, including thallium.

A typical method detection limit for thallium during inductively-coupled plasma analysis is 0.13 mg/kg. Diluting by a factor of 5 to 20 to eliminate calcium spectral interference and nebulizer clogging causes the thallium detection limit to be elevated by a factor of 5 to 20. This results in a MDL that is above the NMED residential SSL of 0.782 mg/kg thallium. Consequently, the required remedy to allow for proper equipment operation resulted in MDLs that were above the NMED residential SSL. However, thallium is not an element that is anticipated to be present at Building 1190 as a result of normal septic tank operation and maintenance.

The validated soil analytical results were compared with the NMED residential SSLs (NMED, 2012a) or the EPA RSLs (EPA, 2012a) if an NMED residential SSL was not established for a given analyte. In addition, a TPH screening level of 1,000 mg/kg was used to evaluate the laboratory analytical data. The 1,000 mg/kg action level for petroleum-contaminated soil is the Residential Direct Exposure Limit for unknown oil, listed in

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Table 6-2 (TPH Screening Guidelines for Potable Groundwater) of the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a).

Of the various inorganic analytes detected, arsenic was reported at concentrations above the NMED SSL of 3.9 mg/kg in the following samples:

- Soil sample OTC533-IS-0003-062512 from the depth interval of 10.0 to 12.0 ft bgs in soil boring OTC533-Station 2 (adjacent to the septic tank location) had an arsenic concentration of 5.6 mg/kg.
- The field duplicate sample OTC533-IS-0007-062512-FD from the depth interval of 10.0 to 12.0 ft bgs in soil boring OTC533-Station 3 (adjacent to the effluent line of the septic tank) had an arsenic concentration of 5.3 mg/kg.
- Soil sample OTC533-IS-0009-062512 from the depth interval of 10.0 to 12.0 ft bgs in soil boring OTC533-Station 4 (monitoring well OTC533-MW01) located on the downgradient side of the leach field had an arsenic concentration of 5.2 mg/kg.

Note that these results are just above NMED SSL (3.9 mg/kg) and the background value established for arsenic in soil at Holloman AFB (3.7 mg/kg); however, these exceedances are considered to be naturally occurring as discussed below in Section 4.4.

No other soil samples had detections above the NMED residential SSLs. Likewise, all soil samples from all locations and depths had TPH-GRO, TPH-DRO, and TPH-ORO concentrations below the TPH screening level. In addition, no tritium was detected in any of the soil samples.

Several samples reported metals detections exceeding their respective Holloman AFB soil background values, as follows:

Sample Number	Depth (ft bgs)	Metal	Result (mg/kg)	Background Value (mg/kg)
– OTC533-IS-0001-062512	3-5	Selenium	2.2	1.4
– OTC533-IS-0003-062512	10-12	Magnesium	22,200	16,991
– OTC533-IS-0003-062512	10-12	Mercury	0.011	0.0108
– OTC533-IS-0003-062512	10-12	Nickel	17.4	17.4
– OTC533-IS-0007-062512	10-12	Magnesium	18,500	16,991
– OTC533-IS-0009-062512	10-12	Magnesium	21,200	16,991
– OTC533-IS-0010-062512	10-12	Mercury	0.016	0.0108

4.1.2 Septic Tank Abandonment Soil Sampling Results

The sludge sample (OTC533-SL-0001-062712) collected from the Building 1190 septic tank prior to its in-place abandonment during the VCM action had three constituents above NMED residential SSLs as follows:

- Arsenic concentration of 6.4 mg/kg – greater than the NMED SSL of 3.9 mg/kg
- Benzo(a)pyrene concentration of 0.661 mg/kg – greater than the NMED SSL of 0.148 mg/kg
- Dibenz(a,h)anthracene concentration of 0.164 mg/kg – greater than the NMED SSL of 0.148 mg/kg.

The tank sludge was characterized as non-hazardous waste and was containerized and transported to Otero/Greentree Regional Landfill in Alamogordo, New Mexico for disposal.

The chemical analytical results for the two confirmatory soil samples (OTC533-CS-0001-092612 and OTC533-CS-0002-092612) collected from the soil from two separate intervals (0.0 to 0.5 ft and 4.5 to 5.0 ft) below the base of the septic tank during in-place abandonment of the tank were below NMED residential SSLs. The analytical results did not include metals analysis for these two intervals, however metals analysis was performed on samples collected adjacent to the tank from the intervals of 1.0 to 2.0 ft (soil sample OTC533-IS-0003-062512) and 8.0 to 10.0 ft (soil sample OTC533-IS-0004-062512) below the base of the septic tank. The analytical results for these samples were below NMED residential SSLs, with the exception of arsenic from the interval 1.0 to 2.0 ft below the base of the septic tank. The arsenic concentration of 5.6 mg/kg was above the NMED residential SSL of 3.9 mg/kg, but within the range of background concentrations for Holloman AFB (as further described in Section 4.4).

The analytical results for soil samples collected adjacent to the downstream septic system components (i.e., effluent line and leach field) were similar to that of the results for the samples collected adjacent to the septic tank (Table 4-2). That is, the analytical results for these samples were below NMED residential SSLs, with the exception of arsenic from a depth interval of 10.0 to 12.0 ft bgs for the effluent line and leach field samples. Again, the arsenic concentrations were within the range of background concentrations for Holloman AFB (as further described in Section 4.4). All other samples collected at or within these septic tank components were below the NMED residential SSLs.

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4.2 Groundwater Analytical Results

One monitoring well (OTC533-MW01) was installed during the RFI, with its location shown on Figure 3-1. Groundwater collected from monitoring well OTC533-MW01 was analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium by Accutest Laboratories, Inc. Detections were compared to the NMWQCC WQS and EPA drinking water MCLs. The Building 1190 groundwater sample had a TDS value of 4,190 mg/L.

Analytical results for the Building 1190 groundwater samples are summarized in Table 4-2. The groundwater results were all below NMWQCC WQS and EPA drinking water MCLs. The results showed detections of the VOCs chloroform (0.32 J micrograms per liter [µg/L]) and trichloroethylene (0.54 J µg/L) with concentrations below regulatory standards. The result for iron of 443 µg/L was above the established Holloman AFB background value of 300 µg/L, but below the NMWQCC limit of 1,000 µg/L.

4.3 Investigation-Derived Waste Analytical Results

A waste characterization sample (OTC533-WC-0001-072512) was collected from the Building 1190 septic tank for the disposal of the sludge. Upon removal from the septic tank, the dry sludge was sampled and stored temporarily in a roll-off container. The septic tank sludge was characterized as nonhazardous according to the results shown in Table 4-3. The nonhazardous sludge was then stored in the roll-off container with other IDW soil for later bulk characterization and disposal. A bulk waste characterization sample (BU-01-IDW-0001-101212) was collected from the waste soil for analysis of Toxicity Characteristic Leaching Procedure VOCs, SVOCs, and RCRA metals. The results of the waste soil analysis returned no concentrations above 40 Code of Federal Regulations Part 261.24 limits (Table 4-3). The waste soil was managed as nonhazardous waste and was subsequently transported to Otero/Greentree Regional Landfill, Alamogordo, New Mexico for disposal. A copy of the waste manifest for the soil disposal is provided in Appendix K.

The wastewater from equipment decontamination was sampled and analyzed for VOCs, SVOCs, TAL metals, TPH-GRO, TPH-DRO, and TPH-ORO, with the analytical results presented in Table 4-4. The analytical results were reviewed by the Holloman AFB wastewater treatment plant personnel, and subsequently accepted for disposal.

4.4 Geochemical Evaluation of Arsenic in Soil

This section summarizes the geochemical evaluation of arsenic concentrations in soil from the Building 1199 site at Holloman Air Force Base (Appendix L contains the detailed evaluation). The 11 soil samples considered in this evaluation were obtained in June, 2012 at

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several depth intervals ranging from 0 to 2 ft to 23 to 25 ft bgs. All of the samples were analyzed for the full suite of 23 TAL metals.

Analyses of 42 background subsurface samples were used for comparison in the evaluation. These background samples were obtained from depths of 7 to 30 ft bgs at intervals that were above the water table. Descriptions of the background samples can be found in the *Basewide Background Study Report for Holloman Air Force Base* (Nation View-Bhate, 2009).

4.4.1 Geochemical Evaluation Summary

Arsenic is evaluated here because the NMED residential SSL of 3.9 mg/kg for arsenic was slightly exceeded in three of the 11 site samples (Table 4-1). The maximum arsenic concentration in these three samples is 5.6 mg/kg and the approved Holloman AFB background value is 3.7 mg/kg (NMED, 2012b).

Note that arsenic concentrations in the 42 subsurface background samples range from non-detect (<0.79 mg/kg) to 5.8 mg/kg. Arsenic concentrations in the 11 site samples are thus within the range of background.

Comparisons to risk-based screening levels and background screening values only consider the absolute concentrations of individual elements, and disregard the interdependence of element concentrations and the geochemical mechanisms controlling element behavior. However, it is well established that trace elements naturally associate with specific minerals in soil and sediment, and the preferential enrichment of a sample with these minerals will result in naturally elevated trace element concentrations. It is thus important to be able to identify these naturally high concentrations and distinguish them from potential contamination.

Recent publications as cited in Appendix L indicate that geochemical evaluations are assuming a larger role in environmental and a properly executed geochemical evaluation can distinguish between naturally high element concentrations versus contamination, and can identify the specific samples that may contain some component of site-related contamination.

To perform the geochemical evaluation, correlation plots are constructed to explore the elemental associations and identify potentially contaminated samples. The detected concentrations of the trace element of interest (dependent variable) are plotted against the detected concentrations of the reference element (independent variable), which represents the mineral to which the trace element may be adsorbed. In the case of arsenic, the arsenic concentrations for a given set of samples would be plotted on the y-axis and the corresponding iron concentrations would be plotted on the x-axis.

If no contamination is present, then the samples will exhibit a common trend with a positive slope, and the samples with the highest trace element concentrations will fall on this trend. This indicates that the elevated trace element concentrations are due to the preferential enrichment of the minerals represented by the reference element concentrations in those samples, and that the trace element has a natural source. If, however, the samples with high trace element concentrations have low or moderate reference element concentrations, then those samples will lie above the trend established by the other samples. This indicates that the anomalous samples contain excess trace elements beyond that which can be explained by the natural reference element content, and such samples may contain a component of contamination.

Arsenic is known to associate with iron oxide minerals. A soil sample that is naturally enriched in iron oxides is expected to be naturally enriched in arsenic. Appendix L (Figure 3) provides a plot of detected arsenic versus iron concentrations in the site and background samples. The site and background samples fall on the same trend, although this trend is less correlated than the iron versus aluminum trend shown in Figure 1 of Appendix L. Eight of the 11 site samples have estimated (J-flagged) arsenic results that are below their reporting limits. Estimated results usually show less correlation on the plots because the true locations of the points are uncertain.

Figure 4 in Appendix L provides a ratio plot of the same arsenic and iron results. This perspective reveals that the site samples have arsenic/iron ratios that fall within the range of the background ratios. There is more spread in the ratios at lower arsenic concentrations, which is likely due to the estimated nature of the analytical results at lower concentrations. However, the consistent arsenic/iron ratios in the site samples, the agreement between the site and background ratios, and the fact that the arsenic site concentrations fall within the range of background concentrations, indicate that the observed arsenic concentrations are most likely natural.

4.5 Risk-Based Evaluation

4.5.1 Soil

Eleven soil samples (including a field duplicate sample) were collected from around the Building 1190 (OT-C533) septic tank system, ranging from surface soil to 25.0 ft bgs on June 25, 2012. Samples of sludge or soil that were removed from the site and disposed at an off-site disposal facility were not included in the risk evaluation.

Per NMED (2012a) the soil depths of interest for a risk evaluation are 0.0 to 10.0 ft bgs for construction workers and residential receptors, and 0.0 to 1.0 ft bgs for commercial/industrial workers. Therefore, results from the screening assessment that present data for all soil depths

as presented in Table 4-1 are used to focus on soil data collected from 0.0 to 10.0 ft bgs (six samples and one field duplicate). Based on the results of the initial screening evaluation for 0.0 to 10.0 ft bgs for soil, no chemicals had maximum detected concentrations greater than: (1) NMED residential SSLs or the EPA RSLs (if NMED values have not been established). Total cancer risk ratios and total hazard ratios (hazard index [HI]) to address potential additive toxicological effects were also assessed (per NMED 2012a, Section 5.0). This was conducted by using maximum detected concentrations of carcinogens and non-carcinogens, estimating risk and hazard ratios, and scaling a total cancer risk and total HI. The total cancer risk did not exceed 1.0×10^{-5} (total cancer risk: 8.2×10^{-6}), as shown in Appendix M. The total HI based on maximum detected concentrations was equal to 0.81 (Appendix M). As the target HI is 1.0, this is acceptable, because the HI does not exceed 1.0.

One chemical (arsenic) had concentrations that slightly exceeded the NMED soil screening value; however, those samples were collected at a depth interval of 10.0 to 12.0 ft bgs. Shallower collocated samples collected from a depth interval of 3.0 to 5.0 ft bgs were all below the arsenic screening value.

Therefore, there are no constituents of potential concern (COPC) in soil, and future residential, current and/or future commercial/industrial worker, and current and/or future construction worker exposure scenarios are not health risks.

4.5.2 Groundwater

One groundwater sample was collected from the Building 1190 monitoring well OTC533-MW01 on July 4, 2012. Based on the results of the screening evaluation from Table 4-2, the groundwater results for the Building 1190 septic system monitoring well were all below NMWQCC WQS and EPA drinking water MCLs.

Therefore, as no chemicals in groundwater were selected as COPCs, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not health risks.

4.5.3 Risk-Based Conclusions

No COPCs were selected in soil or groundwater; therefore, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not health risks. Additionally, total cancer risks and non-cancer hazards in soil were acceptable.

4.6 Ecological Evaluation

The septic system at former Building 1190 was located in a graveled, flat-lying area that served as the parking lot for the building and is now moderately vegetated, as shown in the

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photographic log in Appendix B. A screening-level ecological risk assessment (SLERA) Scoping Assessment Site Assessment Checklist was completed for the Building 1190 (OT-C533) septic tank system and is included in Appendix N. Results of the checklist Exclusion Criteria Decision Tree indicate that the site is a potential viable ecological habitat and a potential exposure pathway exists for soil. Therefore, a SLERA was performed for Building 1190.

Soil data results from 0 to 10 ft bgs were included in the comparison and are provided on Table A of Appendix N. According to NMED (2012c), this is the potential depth of interest for wildlife, including burrowing animals. As shown on Table A (Appendix N), six soil samples were available within the 0 to 10 ft bgs zone. Detected constituents in soil included 18 metals, eight SVOCs, and petroleum hydrocarbons (both diesel and oil range organics). All other constituents were non-detected.

Metals concentrations were compared to Holloman AFB soil background values (Table A, Appendix N). Detected concentrations of metals did not exceed Holloman AFB soil background values in any soil samples evaluated, except for selenium. Therefore, further evaluation was performed for selenium.

Selenium was detected at a concentration of 2.2 mg/kg in one of the four soil samples collected from near the influent line of the former Building 1190 septic system. Selenium's soil background screening value is 1.4 mg/kg. The single detected concentration of selenium in soil data collected at the site was compared to the lowest available ecological screening levels (ESLs) presented in the Los Alamos National Laboratory (LANL) Eco Risk Database version 3.1 (LANL, 2012). The LANL database provides both No-Effect ESLs and Low-Effect ESLs for soil, and both values are provided in Table A of Appendix N. The single selenium detected concentration exceeds seven No-Effect ESLs (ranging from 0.52 mg/kg to 2.1 mg/kg) for avian, mammalian, and plant receptors. Five of the corresponding Low-Effect ESLs are also exceeded. The selenium ESLs (from LANL, 2012) are as follows:

Receptor	No-Effect ESL	Low-Effect ESL	Units
American kestrel (Avian intermediate carnivore)	5.6	11	mg/kg
American kestrel (Avian top carnivore)	97	190	mg/kg
American robin (Avian herbivore)	1	2	mg/kg
American robin (Avian insectivore)	0.75	1.5	mg/kg
American robin (Avian omnivore)	0.87	1.7	mg/kg
Deer mouse (Mammalian omnivore)	0.83	1.2	mg/kg
Desert cottontail (Mammalian herbivore)	2.1	3.2	mg/kg
Earthworm (Soil-dwelling invertebrate)	4.1	41	mg/kg

Receptor	No-Effect ESL	Low-Effect ESL	Units
Generic plant (Terrestrial autotroph - producer)	0.52	3.4	mg/kg
Montane shrew (Mammalian insectivore)	0.66	0.99	mg/kg
Red fox (Mammalian top carnivore)	84	120	mg/kg

Since the maximum detected concentration of selenium exceeds several No-Effect and Low-Effect ESLs, and also the Holloman AFB background screening value, an exposure point concentration (EPC) for selenium was calculated to compare to the ESLs.

Detected concentrations of seven polycyclic aromatic hydrocarbons and bis(2-ethylhexyl) phthalate in soil data collected at the site were compared to the lowest available ESLs presented in the LANL Eco Risk Database version 3.1 (LANL, 2012). The single detected concentrations of all polycyclic aromatic hydrocarbons were below their respective LANL ESLs, indicating that ecological impacts are not likely to occur for these constituents. No ESLs are available for petroleum hydrocarbons from LANL (2012).

The single-detected concentration of bis(2-ethylhexyl) phthalate (0.262 mg/kg) exceeded both the No-Effect ESL (0.02 mg/kg) and the Low-Effect ESL (0.2 mg/kg). The endpoint of concern for the ESLs of 0.0.02 mg/kg and 0.2 mg/kg is potential food chain impacts for an avian insectivore. Bis(2-ethylhexyl) phthalate ESLs (LANL, 2012) are as follows:

Receptor	No-Effect ESL	Low-Effect ESL	Units
American kestrel (Avian intermediate carnivore)	0.045	0.45	mg/kg
American kestrel (Avian insectivore)	0.02	0.2	mg/kg
American kestrel (Avian top carnivore)	0.033	0.33	mg/kg
American robin (Avian herbivore)	20	200	mg/kg
American robin (Avian omnivore)	0.04	0.4	mg/kg
Deer mouse (Mammalian omnivore)	1.1	11	mg/kg
Desert cottontail (Mammalian herbivore)	2700	27000	mg/kg
Montane shrew (Mammalian insectivore)	0.59	5.9	mg/kg
Red fox (Mammalian top carnivore)	1.2	12	mg/kg

The detected concentration of bis(2-ethylhexyl) phthalate (0.262 mg/kg) exceeded four No-Effect ESLs and just the lowest Low-Effect ESL(out of nine available receptor ESLs), all for avian receptors. Based on this finding, a more detailed evaluation was conducted and an EPC for bis(2-ethylhexyl) phthalate will be calculated to compare against the ESLs.

Estimation of EPCs. Per the Work Plan (USACE, 2010), more representative site-specific EPCs should be compared with screening values for both selenium and bis(2-ethylhexyl)

phthalate. EPCs are based on 95 percent upper confidence limit (UCL) of the mean, if possible, estimated using EPA's ProUCL statistical software, version 4.1.01 (EPA, 2010 and 2011). However, as only one detected result, bis(2-ethylhexyl) phthalate, existed in the data set available for the Building 1190 site, ProUCL would not run, and gave the following warning statements:

> "Warning: Only one distinct data value was detected. ProUCL (or any other software) should not be used on such a data set. It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable bis(2-ethylhexyl) phthalate was not processed!"

A similar error message was generated by ProUCL when the selenium data were processed:

> "Warning: This data set only has 4 observations! Data set is too small to compute reliable and meaningful statistics and estimates! The data set for variable Selenium (mg/kg) was not processed!"

Although the warnings indicate other software should not be used or meaningful statistics cannot be estimated, alternative values may be considered. Therefore, a 95 percent UCL value was derived using a Bootstrap-t statistical program, described by Efron (1982) and discussed in EPA (1997). Non-detect values, if present, were represented in this Bootstrap-t program as random numbers between zero and the detection limit that were generated by the iterative process written into the program.

1) The Bootstrap-t method is a nonparametric method recommended by EPA for censored data and was used to calculate 95 percent UCLs for bis(2-ethylhexyl) phthalate when ProUCL would not run. Bootstrap 95 percent UCLs were calculated as follows (Efron and Tibshirani, 1993):

2) The data set was randomly resampled with replacement;

3) The arithmetic mean of the resampled data set was estimated;

4) Steps 1 and 2 were performed 2,000 times and created a new data set of 2,000 resampled means; and

5) The 95th percentile of the resampled mean data set created during Step 3 was selected.

Per Efron and Tibshirani (1993), the 95th percentile of the resampled mean data set is a good approximation of the 95 percent UCL on the mean of the original data set.

Using this Bootstrap method, the 95 percent UCLs for bis(2-ethylhexyl) phthalate and selenium in soil samples are as follows:

- Bis(2-Ethylhexyl) phthalate: 0.173 mg/kg
- Selenium: 2.2 mg/kg.

Statistical evaluation output is provided in Appendix N.

The bis(2-ethylhexyl) phthalate EPC still exceeds the lowest No-Effect ESL (0.02 mg/kg) for an avian insectivore, and also exceeds the Low-Effect ESL (0.2 mg/kg). The EPC of 0.173 mg/kg exceeds four of the nine LANL No-Effect ESLs as shown in the chart above), but does not exceed the lowest Low-Effect ESL (i.e., 0.2 mg/kg for the avian insectivore, the American kestrel). The American kestrel has an average territory of 314 acres (EPA, 1993).

Bis(2-ethylhexyl) phthalate was detected in one of six soil samples collected in the 0 to 10 ft bgs zone. Since the bis(2-ethylhexyl) phthalate Low-Effect ESL for avian insectivores of 0.2 mg/kg is exceeded by the maximum, but not the 95 percent UCL concentrations, adverse effects to populations of avian insectivores are unlikely, but cannot be ruled out. Additionally, the bis(2-ethylhexyl) phthalate No-Effect ESL for avian intermediate and top carnivores, as well as the avian omnivore, were exceeded by the 95 percent UCL concentration. However, the 95 percent UCL concentration was below the Low-Effect ESLs for these same receptors.

It is worth noting that bis(2-ethylhexyl) phthalate is a common laboratory contaminant. It is possible that the presence of this chemical in soil at Building 1190 is related to standard operational procedures employed by the laboratory, rather than it being related to site activities associated with the former septic system.

The selenium EPC was determined to be 2.2 mg/kg, which is the same value as the site maximum concentration. The EPC exceeds five of the eleven LANL Low-Effect ESLs as shown in the chart above. The EPC exceeds the Low-Effect ESL for avian herbivores, avian insectivores, and avian omnivores and for mammal insectivores and mammal omnivores. Selenium was detected in one of four soil samples in the 0 to 10 ft bgs zone. However, two of the three non-detect concentrations for selenium used in the estimation of the EPC were greater than the detected concentration, as shown in Table A of Appendix N. This resulted in a bias on the high end for the EPC that was estimated.

Summary. While the maximum concentration for bis(2-ethylhexyl) phthalate exceeded the Low-Effect ESL for avian insectivores, the EPC did not exceed the ESL. Selenium's maximum concentration and EPC exceeded several Low-Effect ESLs. The investigation of

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the former Building 1190 septic system focused on the area of the former septic tank and its associated leach field. This area is estimated to be approximately 0.06 acres. Of the receptors evaluated by LANL, the deer mouse, the montane shrew, and the desert cottontail would be the receptors most likely to be impacted by constituents in soil at the site due to these receptor's very small territories or home ranges and close association with soil. However, the site maximum and the 95 percent UCL concentrations of bis(2-ethylhexyl) phthalate are less than the ESLs for these receptors. For some of these receptors potentially exposed to selenium, the Low-Effect ESLs for this metal were exceeded. However, as previously noted, the selenium EPC was biased on the high-end due to elevated detection limits for two of the non-detect soil samples.

Therefore, it is concluded that risks to sensitive wildlife receptors at and surrounding the site are generally acceptable because of the very small size of the site (i.e., the impacted soil area is only 0.06 acres), the finding that potentially sensitive avian receptors such as the American kestrel have very large territories (exceeding approximately 300 acres), and the selenium EPC was biased on the high end due to elevated detection limits for two of the non-detect soil samples.

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5.0 DATA QUALITY ASSURANCE AND DATA QUALITY CONTROL REVIEW

All analytical data was reviewed in accordance with EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA, 2004a) and the EPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (EPA, 2004b). Data qualifiers were added to the database prior to project use. The data tables provided in Section 4.0 show the data qualifiers added during data validation. Detailed data validation checklists for each data deliverable are provided in Appendix J.

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6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary and Conclusions

6.1.1 Soil

A total of 14 soil samples were collected from around the septic tank system at Building 1190, including 1 septic tank sludge sample, 11 soil samples from soil borings, 1 waste characterization sample, and 2 confirmation soil samples following abandonment of the septic tank.

The soil samples were analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium. Validated analytical results were compared with the NMED Residential SSLs, the NMED Residential Direct Exposure Limit for soil contaminated with unknown petroleum oil, and the Holloman AFB soil background values.

The sludge sample from the septic tank abandoned during the VCM action had concentrations of one inorganic constituent (arsenic) and two organic constituents (benzo[a]pyrene and dibenz[a,h]anthracene) greater than respective NMED residential SSLs. The sludge was characterized as non-hazardous waste and was containerized and transported to Otero/Greentree Regional Landfill in Alamogordo, New Mexico for disposal.

Three soil samples from soil borings had concentrations of arsenic that slightly exceeded the NMED residential SSL. These samples were collected from a depth interval of 10.0 to 12.0 ft bgs, and in accordance with NMED (2012a) the soil depths of interest are 0.0 to 10.0 ft bgs for construction workers and residential receptors, and 0.0 to 1.0 ft bgs for commercial/industrial workers. Shallower collocated samples collected from a depth interval of 3.0 to 5.0 ft bgs were all below the arsenic screening value. Therefore, the risk-based evaluation concluded that the future residential, current and/or future commercial/industrial worker and current and/or future construction worker exposure scenarios are not a health risk.

The geochemical evaluation concluded that the observed arsenic concentrations are most likely natural as based on the consistent arsenic/iron ratios in the site samples, the agreement between the site and background ratios, and that the arsenic site concentrations fall within the range of background concentrations.

The ecological evaluation concluded that risks to sensitive wildlife receptors at and surrounding the site are generally acceptable because of the very small size of the site (i.e., the impacted soil area is only 0.06 acres) and the finding that potentially sensitive avian

receptors such as the American kestrel have very large territories (exceeding approximately 300 acres), and the selenium EPC was biased on the high end due to elevated detection limits for two of the non-detect soil samples.

6.1.2 Groundwater

One groundwater sample was collected from the Building 1190 monitoring well OTC533-MW01. The sample was analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium. No parameters had concentrations greater than the NMWQCC WQS or the EPA drinking water MCLs.

Risk-based health screening determined that there were no COPCs identified in groundwater.

6.1.3 Septic Tank Abandonment

The Building 1190 septic tank was abandoned in place in accordance with 20.7.3.307 NMAC. In doing so, the concrete tank was demolished and the tank contents (dry sludge) were sampled, removed, and disposed at Otero/Greentree Regional Landfill, a permitted waste facility, located in Alamogordo, New Mexico, and the bottom of the tank was punctured to prevent the tank from holding water.

The two confirmatory soil samples collected from beneath the septic tank contained no constituents above NMED residential SSLs. The chemical analytic results for the confirmation soil samples collected from the soil below the base of the septic tank during in-place abandonment of the tank revealed that the soil contained no constituents above NMED residential SSLs (not including metals analyses). Metals analysis was performed on two soil samples collected adjacent to the tank from the intervals of 1.0 to 2.0 ft and 8.0 to 10.0 ft below the base of the septic tank. The analytical results for these samples were below NMED residential SSLs, with the exception of arsenic from the interval 1.0 to 2.0 ft below the base of the septic tank. The arsenic concentration of 5.6 mg/kg was within the range of background concentrations for Holloman AFB and was considered to be naturally occurring based on the geochemical evaluation. This is also true for soil samples collected adjacent to the other downstream septic system components (i.e., effluent line and leach field). In addition, no detections of any constituents were above regulatory limits or background values for the groundwater sample collected from below the downstream end of the leach field.

Following soil sampling, the concrete baffles and walls of the tank were demolished and pushed into the tank base. The tank excavation was backfilled with clean-fill and the site was compacted and restored to match existing ground surface contours.

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6.2 Recommendations

6.2.1 Soil

The observed arsenic concentrations are considered natural based on the evidence presented in the geochemical evaluation, and no COPCs were identified within the soil depths of interest according to NMED (2012a). In addition, potential risks posed to ecological receptors (i.e., American kestrel) are generally acceptable based on the small size of the site relative to the large territory of the habitat, and, specifically, the selenium EPC was biased on the high end due to elevated detection limits for two of the non-detect soil samples. Therefore, based on these results, no additional corrective action is recommended for soil at Building 1190.

6.2.2 Groundwater

COPCs were not present in groundwater as all constituents detected were below NMWQCC WQS and EPA drinking water MCLs. Therefore, no additional corrective action is recommended for groundwater at Building 1190.

6.2.3 Septic Tank Abandonment

The former septic tank at Building 1190 was abandoned in accordance with 20.7.3.307 NMAC and no further work is required.

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Tables

Table 3-1
Sample Summary
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C533-Station 1	682739.5783	1686318.0278	6/25/2012	Investigation Soil	3 - 5	OTC533-IS-0001-062512	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			6/25/2012	Investigation Soil	10 - 12	OTC533-IS-0002-062512	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OT-C533-Station 2	682708.3574	1686319.9652	6/25/2012	Investigation Soil	10 - 12	OTC533-IS-0003-062512	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			6/25/2012	Investigation Soil	17 - 19	OTC533-IS-0004-062512	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OT-C533-Station 3	682697.3595	1686324.3340	6/25/2012	Investigation Soil	3 - 5	OTC533-IS-0005-062512	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0

Table 3-1
Sample Summary
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C533-Station 3	682697.3595	1686324.3340	6/25/2012	Investigation Soil	10 - 12	OTC533-IS-0006-062512	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			6/25/2012	Investigation Soil - Field Duplicate	10 - 12	OTC533-IS-0007-062512-FD	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OT-C533-MW01 (Station 4)	682679.5367	1686250.5823	6/25/2012	Investigation Soil	3 - 5	OTC533-IS-0008-062512	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			6/25/2012	Investigation Soil	10 - 12	OTC533-IS-0009-062512	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			6/25/2012	Investigation Soil	0 - 2	OTC533-IS-0010-062512	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0

Table 3-1
Sample Summary
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C533-MW01 (Station 4)	682679.5367	1686250.5823	6/25/2012	Investigation Soil	23 - 25	OTC533-IS-0011-062512	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
			7/4/2012	Groundwater	NA	OTC533-GW-5331-070412	TDS	SM2540C
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OT-C533-SL1	682711.1476*	1686325.9232[c]	6/27/2012	Sludge	NA	OTC533-SL-0001-062712	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							Tritium	E906.0
OT-C533-WC	682711.1476*	1686325.9232[c]	7/25/2012	Sludge Waste Characterization	NA	OTC533-WC-0001-072512	Percent Solids	SM2540G
							TCLP RCRA Metals	SW1311/6010C
								SW1311/6020A
								SW1311/7471B
							TCLP VOCs	SW1311/8260B
							TCLP SVOCs	SW1311/8270D
							Reactivity, Corrosivity, Ignitability	SW1010
								SW9012
								SW9030
								SW9045

Table 3-1
Sample Summary
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C533-CS1	682711.1476*	1686325.9232[c]	9/26/2012	Confirmation Soil	4.0 - 4.5 (0.0 to 0.5 feet below tank bottom)	OTC533-CS-0001-092612	Tritium	E906.0
							TPH-GRO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
OT-C533-CS2	682711.1476*	1686325.9232[c]	9/26/2012	Confirmation Soil	9.5 - 10 (4.5 to 5.0 feet below tank bottom)	OTC533-CS-0002-092612	Tritium	E906.0
							TPH-GRO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D

Table 3-1
Sample Summary
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

* Survey coordinates were estimated, as these sample locations were not surveyed in the field. The locations were estimated using field maps, notes, and photography, and then were pinpointed on field maps. These identified locations were then plotted in GIS to best approximate the locations. In some cases, surveyed locations were used to triangulate a non-surveyed location. Once plotted, coordinate locations were calculated using GIS. All coordinates were calculated using the New Mexico State Plane Central NAD 1983 Feet coordinate system.

[a] Coordinates are referenced to the North American Datum, 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] EPA, 2007, Test Methods for Evaluating Soil Waste Physical/Chemical Methods, EPA Publication SW-846, Final Update IV. Available online at www.epa.gov/osw/hazard/testmethods/sw846.

[c] Location coordinates for these samples were estimated using the center of the former UST as the sample location, since the CS samples were collected from beneath the septic tank and the SL and WC samples were collected as composites from within the septic tank.

Percent Solids and Total Dissolved Solids from *Standard Methods for the Examination of Water and Wastewater* , 19th edition, 1995.

CS = confirmation soil
DRO = diesel range organics
EPA = Environmental Protection Agency
FD = field duplicate
ft bgs = feet below ground surface
GRO = gasoline range organics
GW = groundwater
IS = investigation soil
MW = monitoring well
NA = not applicable
ORO = oil range organics
PCB = polychlorinated biphenyl
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
SL = sludge
SVOC = semivolatile organic compound
TAL = target analyte list
TCLP = toxicity characteristic leaching procedure
TDS = total dissolved solids
TPH = total petroleum hydrocarbons
VOC = volatile organic compound
WC = waste characterization

Table 3-2
Monitoring Well Construction Details and Groundwater Elevation Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Well ID	Monitoring Well Construction Details						Groundwater Elevation Data: 07/04/2012		
	Location Coordinates		Installation Date	Well Diameter (in)	Well Depth at Construction (ft bgs)	Screened Interval (ft bgs)	Top of PVC Riser Pipe Elevation[b] (ft amsl)	Depth to Water (ft below top of PVC riser pipe)	Potentiometric Surface Elevation[b] (ft amsl)
	Grid Northing[a]	Grid Easting[a]							
OTC533-MW01	682679.5367	1686250.5823	6/26/2013	2	34.0	24.0 - 34.0	4094.68	24.70	4069.98

[a] Location coordinates are referenced to the North American Datum 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] Elevations are referenced to the North American Vertical Datum of 1988 (NAVD 88).

ft = feet
ft amsl = feet above mean sea level
ft bgs = feet below ground surface
ID = identification
in = inches
PVC = polyvinyl chloride
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation

Table 3-3
Monitoring Well Purge Water Quality Parameters
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Well ID	Sample Date	Depth to Water (ft below top of PVC riser pipe)	Total Depth (ft below top of PVC riser pipe)	Purge Water Volume (gallons)	Temperature (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	TDS (g/L)
OTC533-MW01	7/4/2012	24.70	35.22	25.0	20.70	6.94	4.582	32.5	0.84	143.8	2.98

°C = degrees Celsius
DO = dissolved oxygen
ft = feet
g/L = grams per liter
ID = identification
mg/L = milligrams per liter
mS/cm = millisiemens per centimeter
mV = millivolts
NTU = Nephelometric Turbidity Unit
ORP = oxidation-reduction potential
PVC = polyvinylchloride
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
TDS = total dissolved solids

Table 4-1
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-IS-0001-062512		OTC533-IS-0002-062512		OTC533-IS-0003-062512		OTC533-IS-0004-062512		OTC533-IS-0005-062512		OTC533-IS-0006-062512		OTC533-IS-0007-062512-FD		OTC533-IS-0008-062512		OTC533-IS-0009-062512		OTC533-IS-0010-062512	
			Sample Date	6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012	
			Location	OTC533-Station 1, septic tank influent line		OTC533-Station 1, septic tank influent line		OTC533-Station 2, septic tank		OTC533-Station 2, septic tank		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01	
			Depth (ft bgs)	3 - 5		10 - 12		10 - 12		17 - 19		3 - 5		10 - 12		10 - 12		3 - 5		10 - 12		0 - 2	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE	**88**		**82.9**		**84.9**		**85.3**		**75.3**		**81.6**		**82**		**76**		**84.5**		**88.6**	
VOLATILES (mg/kg)																							
1,1,1-TRICHLOROETHANE	NE	8700	15600	0.0011	U	0.0011	U	0.00096	U	0.00084	U	0.0019	U	0.00092	U	0.0011	U	0.0013	U	0.0011	U	0.0014	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02	0.0012	U	0.0012	U	0.0011	U	0.00091	U	0.0021	UJ	0.001	U	0.0012	U	0.0015	U	0.0012	U	0.0015	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100	0.0017	U	0.0017	U	0.0015	U	0.0013	U	0.003	U	0.0014	U	0.0016	U	0.0021	U	0.0017	U	0.0021	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81	0.0011	U	0.0011	U	0.00096	U	0.00084	U	0.0019	U	0.00092	U	0.0011	U	0.0013	U	0.0011	U	0.0014	U
1,1-DICHLOROETHANE	NE	3.3	64.5	0.0011	U	0.0011	U	0.00096	U	0.00084	U	0.0019	U	0.00092	U	0.0011	U	0.0013	U	0.0011	U	0.0014	U
1,1-DICHLOROETHENE	NE	240	449	0.0014	U	0.0014	U	0.0012	U	0.0011	U	0.0025	U	0.0012	U	0.0013	U	0.0017	U	0.0014	U	0.0017	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0	0.0012	U	0.0012	U	0.0011	U	0.00091	U	0.0021	U	0.001	U	0.0012	U	0.0015	U	0.0012	U	0.0015	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86	0.0023	U	0.0023	U	0.002	U	0.0018	U	0.0041	UJ	0.0019	U	0.0022	U	0.0028	U	0.0022	U	0.0029	U
1,2-DIBROMOETHANE	NE	0.034	0.588	0.001	U	0.00098	U	0.00088	U	0.00076	U	0.0018	U	0.00084	U	0.00096	U	0.0012	U	0.00097	U	0.0012	U
1,2-DICHLOROBENZENE	NE	1900	2310	0.0011	U	0.0011	U	0.00096	U	0.00084	U	0.0019	U	0.00092	U	0.0011	U	0.0013	U	0.0011	U	0.0014	U
1,2-DICHLOROETHANE	NE	0.43	7.89	0.001	U	0.00098	U	0.00088	U	0.00076	U	0.0018	U	0.00084	U	0.00096	U	0.0012	U	0.00097	U	0.0012	U
1,2-DICHLOROPROPANE	NE	0.94	15.2	0.0012	U	0.0012	U	0.0011	U	0.00091	U	0.0021	U	0.001	U	0.0012	U	0.0015	U	0.0012	U	0.0015	U
1,3-DICHLOROBENZENE	NE	NE	NE	0.0012	U	0.0012	U	0.0011	U	0.00091	U	0.0021	U	0.001	U	0.0012	U	0.0015	U	0.0012	U	0.0015	U
1,4-DICHLOROBENZENE	NE	2.4	31.7	0.0011	U	0.0011	U	0.00096	U	0.00084	U	0.0019	U	0.00092	U	0.0011	U	0.0013	U	0.0011	U	0.0014	U
2-HEXANONE	NE	210	NE	0.0055	U	0.0053	U	0.0047	U	0.0041	U	0.0095	U	0.0045	U	0.0052	U	0.0065	U	0.0053	U	0.0067	U
ACETONE	NE	61000	66600	0.02	U	0.02	U	0.018	U	0.015	U	0.035	U	0.017	U	0.019	U	0.024	U	0.019	U	0.025	U
BENZENE	NE	1.1	15.4	0.0015	U	0.0015	U	0.0013	U	0.0011	U	0.0026	U	0.0013	U	0.0014	U	0.0018	U	0.0015	U	0.0019	U
BROMODICHLOROMETHANE	NE	0.27	5.41	0.0011	UJ	0.0011	UJ	0.00096	UJ	0.00084	UJ	0.0019	U	0.00092	UJ	0.0011	U	0.0013	U	0.0011	U	0.0014	U
BROMOFORM	NE	62	616	0.0015	U	0.0015	U	0.0013	U	0.0011	U	0.0026	U	0.0013	U	0.0014	U	0.0018	U	0.0015	U	0.0019	U
BROMOMETHANE	NE	7.3	16.5	0.002	U	0.002	U	0.0018	U	0.0015	U	0.0035	U	0.0017	U	0.0019	U	0.0024	U	0.0019	U	0.0025	U
CARBON DISULFIDE	NE	820	1530	0.002	U	0.002	U	0.0018	U	0.0015	U	0.0035	U	0.0017	U	0.0019	U	0.0024	U	0.0019	U	0.0025	U
CARBON TETRACHLORIDE	NE	0.61	10.8	0.0018	UJ	0.0018	UJ	0.0016	UJ	0.0014	UJ	0.0032	U	0.0015	UJ	0.0017	U	0.0022	U	0.0018	U	0.0022	U
CHLOROBENZENE	NE	290	376	0.001	U	0.00098	U	0.00088	U	0.00076	U	0.0018	U	0.00084	U	0.00096	U	0.0012	U	0.00097	U	0.0012	U
CHLOROETHANE	NE	15000	29800	0.002	U	0.002	U	0.0018	U	0.0015	U	0.0035	U	0.0017	U	0.0019	U	0.0024	U	0.0019	U	0.0025	U
CHLOROFORM	NE	0.29	5.86	0.0012	U	0.0012	U	0.0011	U	0.00091	U	0.0021	U	0.001	U	0.0012	U	0.0015	U	0.0012	U	0.0015	U
CHLOROMETHANE	NE	120	275	0.002	U	0.002	U	0.0018	U	0.0015	U	0.0035	U	0.0017	U	0.0019	U	0.0024	U	0.0019	U	0.0025	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156	0.0015	U	0.0015	U	0.0013	U	0.0011	U	0.0026	U	0.0013	U	0.0014	U	0.0018	U	0.0015	U	0.0019	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	0.001	U	0.00098	U	0.00088	U	0.00076	U	0.0018	U	0.00084	U	0.00096	U	0.0012	U	0.00097	U	0.0012	U
CYCLOHEXANE	NE	7000	NE	0.0014	U	0.0014	U	0.0012	U	0.0011	U	0.0025	U	0.0012	U	0.0013	U	0.0017	U	0.0014	U	0.0017	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1	0.001	U	0.00098	U	0.00088	U	0.00076	U	0.0018	U	0.00084	U	0.00096	U	0.0012	U	0.00097	U	0.0012	U
DICHLORODIFLUOROMETHANE	NE	94	168	0.0015	U	0.0015	U	0.0013	U	0.0011	U	0.0026	U	0.0013	U	0.0014	U	0.0018	U	0.0015	U	0.0019	U
ETHYLBENZENE	NE	5.4	68.4	0.001	U	0.00098	U	0.00088	U	0.00076	U	0.0018	U	0.00084	U	0.00096	U	0.0012	U	0.00097	U	0.0012	U
ISOPROPYLBENZENE	NE	2100	2430	0.0011	U	0.0011	U	0.00096	U	0.00084	U	0.0019	U	0.00092	U	0.0011	U	0.0013	U	0.0011	U	0.0014	U
METHYL ACETATE	NE	78000	78200	0.013	U	0.012	U	0.011	U	0.0095	U	0.022	U	0.011	U	0.012	U	0.015	U	0.012	U	0.016	U
METHYL ETHYL KETONE	NE	28000	37100	0.0062	U	0.006	U	0.0053	U	0.0046	U	0.011	U	0.0051	U	0.0059	U	0.0074	U	0.0059	U	0.0076	R
METHYL ISOBUTYL KETONE	NE	5300	5820	0.0056	U	0.0054	U	0.0048	U	0.0042	U	0.0097	U	0.0046	U	0.0053	U	0.0067	U	0.0054	U	0.0069	U
METHYLCYCLOHEXANE	NE	5630	5630	0.0013	U	0.0013	U	0.0011	U	0.00099	U	0.0023	U	0.0011	U	0.0012	U	0.0016	U	0.0013	U	0.0016	U
METHYLENE CHLORIDE	NE	56	409	0.0047	U	0.0045	U	0.004	U	0.0035	U	0.0081	U	0.0039	U	0.0044	U	0.0056	U	0.0045	U	0.0057	U

Table 4-1
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC533-IS-0001-062512		OTC533-IS-0002-062512		OTC533-IS-0003-062512		OTC533-IS-0004-062512		OTC533-IS-0005-062512		OTC533-IS-0006-062512		OTC533-IS-0007-062512-FD		OTC533-IS-0008-062512		OTC533-IS-0009-062512		OTC533-IS-0010-062512	
				Sample Date	6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012	
				Location	OTC533-Station 1, septic tank influent line		OTC533-Station 1, septic tank influent line		OTC533-Station 2, septic tank		OTC533-Station 2, septic tank		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01	
				Depth (ft bgs)	3 - 5		10 - 12		10 - 12		17 - 19		3 - 5		10 - 12		10 - 12		3 - 5		10 - 12		0 - 2	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																								
STYRENE	NE	6300	7280	0.0026	U	0.0025	U	0.0023	U	0.002	U	0.0046	U	0.0022	U	0.0025	U	0.0032	U	0.0025	U	0.0032	U
TERT-BUTYL METHYL ETHER	NE	43	901	0.002	U	0.002	U	0.0018	U	0.0015	U	0.0035	U	0.0017	U	0.0019	U	0.0024	U	0.0019	U	0.0025	U
TETRACHLOROETHYLENE	NE	22	7.02	0.001	U	0.00098	U	0.00088	U	0.00076	U	0.0018	U	0.00084	U	0.00096	U	0.0012	U	0.00097	U	0.0012	U
TOLUENE	NE	5000	5270	0.0012	U	0.0012	U	0.0011	U	0.00091	U	0.0021	U	0.001	UJ	0.0012	UJ	0.0015	U	0.0012	U	0.0015	U
TRANS-1,2-DICHLOROETHENE	NE	150	270	0.0015	U	0.0015	U	0.0013	U	0.0011	U	0.0026	U	0.0013	U	0.0014	U	0.0018	U	0.0015	U	0.0019	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.0011	U	0.0011	U	0.00096	U	0.00084	U	0.0019	U	0.00092	U	0.0011	U	0.0013	U	0.0011	U	0.0014	U
TRICHLOROETHYLENE	NE	0.91	8.77	0.0012	U	0.0012	U	0.0011	U	0.00091	U	0.0021	U	0.001	U	0.0012	U	0.0015	U	0.0012	U	0.0015	U
TRICHLOROFLUOROMETHANE	NE	790	1410	0.002	U	0.002	U	0.0018	U	0.0015	U	0.0035	U	0.0017	U	0.0019	U	0.0024	U	0.0019	U	0.0025	U
VINYL CHLORIDE	NE	0.06	0.728	0.0015	U	0.0015	U	0.0013	U	0.0011	U	0.0026	U	0.0013	U	0.0014	U	0.0018	U	0.0015	U	0.0019	U
XYLENES, TOTAL	NE	630	814	0.0032	U	0.0031	U	0.0028	U	0.0024	U	0.0056	U	0.0027	U	0.0031	U	0.0039	U	0.0031	U	0.004	U
SEMIVOLATILES (mg/kg)																								
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	4.6	91.5	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
2,4-DICHLOROPHENOL	NE	180	183	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
2,4-DIMETHYLPHENOL	NE	1200	1220	0.024	U	0.025	U	0.025	U	0.024	U	0.027	U	0.026	U	0.026	U	0.028	U	0.025	U	0.024	U
2,4-DINITROPHENOL	NE	120	122	0.38	U	0.4	U	0.39	U	0.39	U	0.44	U	0.42	U	0.41	U	0.44	U	0.39	U	0.37	U
2,4-DINITROTOLUENE	NE	1.6	15.7	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
2,6-DINITROTOLUENE	NE	61	61.1	0.022	U	0.024	U	0.023	U	0.023	U	0.026	U	0.025	U	0.024	U	0.026	U	0.023	U	0.022	U
2-CHLORONAPHTHALENE	NE	6300	6260	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
2-CHLOROPHENOL	NE	390	391	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
2-METHYLNAPHTHALENE	NE	230	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
2-METHYLPHENOL	NE	3100	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
2-NITROANILINE	NE	610	NE	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
2-NITROPHENOL	NE	NE	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
3-NITROANILINE	NE	NE	NE	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	0.076	U	0.08	U	0.079	U	0.077	U	0.087	U	0.083	U	0.081	U	0.087	U	0.078	U	0.075	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
4-CHLOROANILINE	NE	2.4	NE	0.019	UJ	0.02	UJ	0.02	UJ	0.019	UJ	0.022	UJ	0.021	UJ	0.02	UJ	0.022	UJ	0.02	UJ	0.019	UJ
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
4-NITROANILINE	NE	24	NE	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
4-NITROPHENOL	NE	NE	NE	0.15	U	0.16	U	0.16	U	0.15	U	0.17	U	0.17	U	0.16	U	0.17	U	0.16	U	0.15	U
ACENAPHTHENE	NE	3400	3440	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
ACENAPHTHYLENE	NE	NE	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
ACETOPHENONE	NE	7800	7820	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
ANTHRACENE	NE	17000	17200	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
ATRAZINE	NE	2.1	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U

Table 4-1
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-IS-0001-062512		OTC533-IS-0002-062512		OTC533-IS-0003-062512		OTC533-IS-0004-062512		OTC533-IS-0005-062512		OTC533-IS-0006-062512		OTC533-IS-0007-062512-FD		OTC533-IS-0008-062512		OTC533-IS-0009-062512		OTC533-IS-0010-062512	
			Sample Date	6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012	
			Location	OTC533-Station 1, septic tank influent line		OTC533-Station 1, septic tank influent line		OTC533-Station 2, septic tank		OTC533-Station 2, septic tank		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01	
			Depth (ft bgs)	3 - 5		10 - 12		10 - 12		17 - 19		3 - 5		10 - 12		10 - 12		3 - 5		10 - 12		0 - 2	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																							
BENZALDEHYDE	NE	7800	NE	0.19	U	0.2	U	0.2	U	0.19	U	0.22	U	0.21	U	0.2	U	0.22	U	0.2	U	0.19	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
BENZO(A)PYRENE	NE	0.015	0.148	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
BIPHENYL	NE	51	57.1	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.076	U	0.08	U	0.079	U	0.077	U	0.087	U	0.083	U	0.081	U	0.087	U	0.078	U	0.075	U
CAPROLACTAM	NE	31000	NE	0.061	U	0.064	U	0.063	U	0.062	U	0.07	U	0.066	U	0.065	U	0.07	U	0.063	U	0.06	U
CARBAZOLE	NE	NE	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
CHRYSENE	NE	15	148	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
DIBENZOFURAN	NE	78	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
DIETHYL PHTHALATE	NE	49000	48900	0.076	U	0.08	U	0.079	U	0.077	U	0.087	U	0.083	U	0.081	U	0.087	U	0.078	U	0.075	U
DIMETHYL PHTHALATE	NE	611000	611000	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.076	U	0.08	U	0.079	U	0.077	U	0.087	U	0.083	U	0.081	U	0.087	U	0.078	U	0.075	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
FLUORANTHENE	NE	2300	2290	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
FLUORENE	NE	2300	2290	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.084	U	0.088	U	0.087	U	0.085	U	0.096	U	0.091	U	0.089	U	0.096	U	0.086	U	0.082	U
HEXACHLOROETHANE	NE	12	42.8	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
ISOPHORONE	NE	510	5120	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	UJ
M,P-CRESOL	NE	NE	NE	0.027	U	0.029	U	0.028	U	0.028	U	0.031	U	0.03	U	0.029	U	0.031	U	0.028	U	0.027	U
NAPHTHALENE	NE	3.6	43.0	0.031	U	0.032	U	0.032	U	0.031	U	0.035	U	0.033	U	0.033	U	0.035	U	0.031	U	0.03	U
NITROBENZENE	NE	4.8	53.5	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.23	U	0.24	U	0.24	U	0.23	U	0.26	U	0.25	U	0.24	U	0.26	U	0.24	U	0.22	U
PHENANTHRENE	NE	1830	1830	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
PHENOL	NE	18000	18300	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
PYRENE	NE	1700	1720	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U

Table 4-1
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-IS-0001-062512		OTC533-IS-0002-062512		OTC533-IS-0003-062512		OTC533-IS-0004-062512		OTC533-IS-0005-062512		OTC533-IS-0006-062512		OTC533-IS-0007-062512-FD		OTC533-IS-0008-062512		OTC533-IS-0009-062512		OTC533-IS-0010-062512	
			Sample Date	6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012	
			Location	OTC533-Station 1, septic tank influent line		OTC533-Station 1, septic tank influent line		OTC533-Station 2, septic tank		OTC533-Station 2, septic tank		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01	
			Depth (ft bgs)	3 - 5		10 - 12		10 - 12		17 - 19		3 - 5		10 - 12		10 - 12		3 - 5		10 - 12		0 - 2	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																							
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.062	U	0.071	U	0.065	U	0.066	U	0.078	U	0.068	U	0.072	U	0.067	U	0.063	U	0.074	U
1,3-DINITROBENZENE	NE	6.10	NE	0.062	U	0.071	U	0.065	U	0.066	U	0.078	U	0.068	U	0.072	U	0.067	U	0.063	U	0.074	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.062	U	0.071	U	0.065	U	0.066	U	0.078	U	0.068	U	0.072	U	0.067	U	0.063	U	0.074	U
2,4-DINITROTOLUENE	NE	1.60	15.7	0.075	U	0.087	U	0.079	U	0.08	U	0.095	U	0.082	U	0.087	U	0.082	U	0.077	U	0.089	U
2,6-DINITROTOLUENE	NE	61.0	61.1	0.068	U	0.078	U	0.07	U	0.072	U	0.085	U	0.073	U	0.078	U	0.073	U	0.069	U	0.08	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.062	U	0.071	U	0.065	U	0.066	U	0.078	U	0.068	U	0.072	U	0.067	U	0.063	U	0.074	U
2-NITROTOLUENE	NE	2.90	29.1	0.062	U	0.071	U	0.065	U	0.066	U	0.078	U	0.068	U	0.072	U	0.067	U	0.063	U	0.074	U
3-NITROTOLUENE	NE	6.10	7.82	0.062	U	0.071	U	0.065	U	0.066	U	0.078	U	0.068	U	0.072	U	0.067	U	0.063	U	0.074	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.062	U	0.071	U	0.065	U	0.066	U	0.078	U	0.068	U	0.072	U	0.067	U	0.063	U	0.074	U
4-NITROTOLUENE	NE	30.0	244.4	0.079	U	0.09	U	0.082	U	0.084	U	0.099	U	0.085	U	0.091	U	0.085	U	0.08	U	0.093	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.160	U	0.180	U	0.160	U	0.170	U	0.200	U	0.170	U	0.180	U	0.170	U	0.160	U	0.180	U
NITROBENZENE	NE	4.80	53.5	0.072	U	0.083	U	0.075	U	0.077	U	0.091	U	0.078	U	0.083	U	0.078	U	0.074	U	0.086	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.062	U	0.071	U	0.065	U	0.066	U	0.078	U	0.068	U	0.072	U	0.067	U	0.063	U	0.074	U
TETRYL	NE	240.0	244.0	0.062	U	0.071	U	0.065	U	0.066	U	0.078	U	0.068	U	0.072	U	0.067	U	0.063	U	0.074	U
PCBS (mg/kg)																							
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0076	U	0.0081	U	0.0077	U	0.0078	UJ	0.0088	U	0.0081	U	0.0081	U	0.0088	U	0.0079	U	0.0074	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.0094	U	0.01	U	0.0097	U	0.0098	U	0.011	U	0.01	U	0.01	U	0.011	U	0.0099	U	0.0093	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.0094	U	0.01	U	0.0097	U	0.0098	U	0.011	U	0.01	U	0.01	U	0.011	U	0.0099	U	0.0093	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0076	U	0.0081	U	0.0077	U	0.0078	U	0.0088	U	0.0081	U	0.0081	U	0.0088	U	0.0079	U	0.0074	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0076	U	0.0081	U	0.0077	U	0.0078	U	0.0088	U	0.0081	U	0.0081	U	0.0088	U	0.0079	U	0.0074	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0076	U	0.0081	U	0.0077	U	0.0078	U	0.0088	U	0.0081	U	0.0081	U	0.0088	U	0.0079	U	0.0074	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0076	U	0.0081	U	0.0077	U	0.0078	UJ	0.0088	U	0.0081	U	0.0081	U	0.0088	U	0.0079	U	0.0074	U
METALS (mg/kg)																							
ALUMINUM	13722	77000	78000	**5980**	J	**6760**		**16300**		**3120**		**681**		**8340**		**10100**		**1150**		**11900**		**12800**	
ANTIMONY	1.6	31	31.3	0.91	UJ	0.87	U	0.9	U	0.92	U	1.3	U	0.88	U	0.79	U	1.8	U	1.2	U	0.77	U
ARSENIC	3.7	0.39	3.90	**2.4**	J	**1**	J	**5.6**		**1.3**	J	1.3	U	**1.9**	J	**5.3**		**1.1**	J	**5.2**	J	**2.4**	J
BARIUM	169.3	15000	15600	**77.1**	J	**69.5**	J	**102**		**30.8**	J	**15**	J	**64.3**	J	**92.5**		**21.8**	J	**73.5**	J	**91**	
BERYLLIUM	1.6	160	156	0.45	U	0.44	U	**1.1**	J	0.46	U	0.63	U	**0.48**	J	**0.66**	J	0.44	U	**0.81**	J	**0.55**	J
CADMIUM	0.3	70	70.3	0.45	U	0.44	U	0.45	U	0.46	U	0.63	U	0.44	U	0.39	U	0.88	U	0.59	U	**0.39**	U
CALCIUM	317332	NE	NE	**210000**		**214000**		**170000**		**243000**		**219000**		**187000**		**174000**		**266000**		**170000**		**143000**	
CHROMIUM[d]	25	117000	117000	**5.4**	J	**6.7**		**18**		**2.9**	J	**0.8**	J	**8.8**		**11.2**		**1.3**	J	**12.9**		**11.3**	
COBALT	7.7	23	NE	**2.6**	J	**2.8**	J	**6.7**	J	**1.3**	J	0.63	U	**3.4**	J	**4.5**	J	**0.51**	J	**5.7**	J	**4.3**	J
COPPER	13	3100	3130	**5.1**	J	**4.2**	J	**10.5**	J	**1.9**	J	**1.4**	J	**5.6**	J	**7.8**	J	**2**	J	**8.3**	J	**9.7**	
IRON	23049	55000	54800	**5660**	J	**6250**		**16200**		**2880**		**564**		**8940**		**12300**		**884**		**12400**		**11300**	
LEAD	10.9	400	400	**4.5**	J	**4.7**	J	**10.6**		**3.1**	J	0.63	U	**5.6**	J	**7.1**	J	0.88	U	**6.8**	J	**7.3**	J
MAGNESIUM	16991	NE	NE	**2540**		**4260**		**22200**		**2340**		**1460**	J	**10300**		**18500**		**1180**	J	**21200**		**9780**	
MANGANESE	393	1800	1860	**123**		**130**		**216**		**49.5**		**11.7**		**109**		**147**		**17.2**		**174**		**269**	
MERCURY	0.0108	10	15.6	0.009	U	0.0097	U	**0.011**	J	0.0092	U	0.011	U	0.0091	U	0.0092	U	0.01	U	0.0095	U	0.009	U
NICKEL	17.4	1500	1560	**5.2**	J	**6**	J	**17.4**	J	**2.8**	J	**1**	J	**7.6**	J	**10.4**	J	**1.1**	J	**12.5**	J	**9.5**	J
POTASSIUM	5077	NE	NE	**1590**	J	**1510**	J	**3190**	J	**861**	J	320	U	**1800**	J	**2040**	J	**367**	J	**2390**	J	**3480**	J

Table 4-1
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-IS-0001-062512		OTC533-IS-0002-062512		OTC533-IS-0003-062512		OTC533-IS-0004-062512		OTC533-IS-0005-062512		OTC533-IS-0006-062512		OTC533-IS-0007-062512-FD		OTC533-IS-0008-062512		OTC533-IS-0009-062512		OTC533-IS-0010-062512	
			Sample Date	6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012	
			Location	OTC533-Station 1, septic tank influent line		OTC533-Station 1, septic tank influent line		OTC533-Station 2, septic tank		OTC533-Station 2, septic tank		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01	
			Depth (ft bgs)	3 - 5		10 - 12		10 - 12		17 - 19		3 - 5		10 - 12		10 - 12		3 - 5		10 - 12		0 - 2	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
METALS - continued (mg/kg)																							
SELENIUM	1.4	390	391	**2.2**	J	1.7	U	1.8	U	1.8	U	2.5	U	1.8	U	1.6	U	3.5	U	2.3	U	1.5	U
SILVER	1.1	390	391	0.45	U	0.44	U	0.45	U	0.46	U	0.63	U	0.44	U	0.39	U	0.44	U	0.59	U	0.39	U
SODIUM	5200	NE	NE	500	U	480	U	**519**	J	**590**	J	700	U	480	U	**532**	J	480	U	**831**	J	**2290**	J
THALLIUM	1.3	0.78	0.782	1.2	U	1.1	U	1.2	U	1.2	U	1.6	U	1.1	U	1	U	2.3	U	1.5	U	1	U
VANADIUM	42.6	390	391	**12.3**	J	**12**	J	**30.8**		**7.3**	J	**2.8**	J	**18.1**	J	**28.6**		**3**	J	**27.6**	J	**17**	J
ZINC	54.6	23000	23500	**16.9**		**14.6**		**44.3**		**7.9**	J	3.2	U	**22.1**		**27**		4.4	U	**30.7**		**37.1**	
PETROLEUM HYDROCARBONS (mg/kg)																							
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	3.1	U	3.6	U	3.4	U	2.4	U	4.2	U	2.9	U	3	U	4	U	3	U	3.2	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	**6.48**	J	4	U	3.9	U	3.9	U	4.4	U	4	U	4	U	4.4	U	3.9	U	3.7	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000	**9.8**		**7.21**	J	3.9	U	3.9	U	4.4	U	4	U	4	U	4.4	U	3.9	U	3.7	U
CYANIDE (mg/kg)																							
CYANIDE	NE	22.0	46.9	0.068	U	0.072	U	0.071	U	0.07	U	0.08	U	0.074	U	0.073	U	0.079	U	0.07	U	0.066	U
TRITIUM (pCi/g)																							
TRITIUM	NE	NE	NE	4.99	U	5.04	U	4.95	U	4.93	U	5.1	U	5.03	U	4.99	U	4.9	U	5.06	U	4.88	U

Table 4-1
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-IS-0011-062512		OTC533-SL-0001-062712		OTC533-CS-0001-092612		OTC533-CS-0002-092612	
			Sample Date	6/25/2012		6/27/2012		9/26/2012		9/26/2012	
			Location	OTC533-Station 4, leach field, OTC533-MW01		Septic tank sludge		Beneath septic tank		Beneath septic tank	
			Depth (ft bgs)	23 - 25		0 - 1		0 - 0.5		4.5 - 5	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE	**77.9**		**57.1**					
VOLATILES (mg/kg)											
1,1,1-TRICHLOROETHANE	NE	8700	15600	0.00086	U	0.0019	U	0.0012	UJ	0.0011	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02	0.00093	U	0.002	U	0.0012	U	0.0011	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100	0.0013	U	0.0029	U	0.0017	U	0.0016	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81	0.00086	U	0.0019	U	0.0012	U	0.0011	U
1,1-DICHLOROETHANE	NE	3.3	64.5	0.00086	U	0.0019	U	0.0012	U	0.0011	U
1,1-DICHLOROETHENE	NE	240	449	0.0011	U	0.0024	U	0.0014	U	0.0014	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0	0.00093	U	0.002	UJ	0.0014	U	0.0013	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86	0.0018	U	0.0039	UJ	0.003	UJ	0.0028	U
1,2-DIBROMOETHANE	NE	0.034	0.588	0.00078	U	0.0017	U	0.0012	U	0.0011	U
1,2-DICHLOROBENZENE	NE	1900	2310	0.00086	UJ	0.0019	U	0.0013	U	0.0012	U
1,2-DICHLOROETHANE	NE	0.43	7.89	0.00078	U	0.0017	U	0.0014	U	0.0013	U
1,2-DICHLOROPROPANE	NE	0.94	15.2	0.00093	U	0.002	U	0.0012	U	0.0011	U
1,3-DICHLOROBENZENE	NE	NE	NE	0.00093	U	0.002	U	0.0012	U	0.0011	U
1,4-DICHLOROBENZENE	NE	2.4	31.7	0.00086	UJ	0.0019	U	0.0016	U	0.0015	U
2-HEXANONE	NE	210	NE	0.0042	U	0.0091	U	0.0059	U	0.0056	U
ACETONE	NE	61000	66600	0.016	UJ	**0.0494**	J	0.024	U	0.022	U
BENZENE	NE	1.1	15.4	0.0012	U	0.0025	U	0.0012	U	0.0011	U
BROMODICHLOROMETHANE	NE	0.27	5.41	0.00086	U	0.0019	U	0.0017	U	0.0016	U
BROMOFORM	NE	62	616	0.0012	U	0.0025	U	0.0012	U	0.0011	U
BROMOMETHANE	NE	7.3	16.5	0.0016	U	0.0034	U	0.0024	U	0.0022	U
CARBON DISULFIDE	NE	820	1530	0.0016	U	0.0034	U	0.0024	U	0.0022	U
CARBON TETRACHLORIDE	NE	0.61	10.8	0.0014	U	0.003	U	0.0014	U	0.0013	U
CHLOROBENZENE	NE	290	376	0.00078	U	0.0017	U	0.0012	U	0.0011	U
CHLOROETHANE	NE	15000	29800	0.0016	U	0.0034	U	0.0024	U	0.0022	U
CHLOROFORM	NE	0.29	5.86	0.00093	U	0.002	U	0.0012	U	0.0011	U
CHLOROMETHANE	NE	120	275	0.0016	U	0.0034	U	0.0025	U	0.0023	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156	0.0012	U	0.0025	U	0.0012	U	0.0011	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	0.00078	UJ	0.0017	U	0.0012	U	0.0011	U
CYCLOHEXANE	NE	7000	NE	0.0011	UJ	0.0024	U	0.0012	U	0.0011	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1	0.00078	U	0.0017	U	0.0012	U	0.0011	U
DICHLORODIFLUOROMETHANE	NE	94	168	0.0012	U	0.0025	U	0.0012	U	0.0011	U
ETHYLBENZENE	NE	5.4	68.4	0.00078	U	0.0017	U	0.0013	U	0.0012	U
ISOPROPYLBENZENE	NE	2100	2430	0.00086	UJ	0.0019	U	0.0016	U	0.0015	U
METHYL ACETATE	NE	78000	78200	0.0097	UJ	0.021	U	0.013	U	0.012	U
METHYL ETHYL KETONE	NE	28000	37100	0.0048	R	0.01	U	0.0059	U	0.0056	U
METHYL ISOBUTYL KETONE	NE	5300	5820	0.0043	UJ	0.0093	U	0.0059	U	0.0056	U
METHYLCYCLOHEXANE	NE	5630	5630	0.001	UJ	0.0022	U	0.0012	U	0.0011	U
METHYLENE CHLORIDE	NE	56	409	0.0036	U	0.0078	U	0.0054	U	0.0051	U

Table 4-1
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-IS-0011-062512		OTC533-SL-0001-062712		OTC533-CS-0001-092612		OTC533-CS-0002-092612	
			Sample Date	6/25/2012		6/27/2012		9/26/2012		9/26/2012	
			Location	OTC533-Station 4, leach field, OTC533-MW01		Septic tank sludge		Beneath septic tank		Beneath septic tank	
			Depth (ft bgs)	23 - 25		0 - 1		0 - 0.5		4.5 - 5	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)											
STYRENE	NE	6300	7280	0.002	U	0.0044	U	0.0012	U	0.0011	U
TERT-BUTYL METHYL ETHER	NE	43	901	0.0016	U	0.0034	U	0.0012	U	0.0011	U
TETRACHLOROETHYLENE	NE	22	7.02	0.00078	U	0.0017	U	0.0014	U	0.0013	U
TOLUENE	NE	5000	5270	0.00093	U	0.002	U	0.0012	U	0.0011	U
TRANS-1,2-DICHLOROETHENE	NE	150	270	0.0012	U	0.0025	U	0.0012	U	0.0011	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.00086	UJ	0.0019	U	0.0012	UJ	0.0011	U
TRICHLOROETHYLENE	NE	0.91	8.77	0.00093	U	0.002	U	0.0012	U	0.0011	U
TRICHLOROFLUOROMETHANE	NE	790	1410	0.0016	U	0.0034	U	0.0024	U	0.0022	U
VINYL CHLORIDE	NE	0.06	0.728	0.0012	U	0.0025	U	0.0012	U	0.0011	U
XYLENES, TOTAL	NE	630	814	0.0025	U	0.0054	U	0.0036	U	0.0034	U
SEMIVOLATILES (mg/kg)											
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	4.6	91.5	0.022	U	0.12	U	0.024	U	0.023	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110	0.022	U	0.12	U	0.025	U	0.024	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1	0.022	U	0.12	U	0.027	U	0.026	U
2,4-DICHLOROPHENOL	NE	180	183	0.022	U	0.12	U	0.024	U	0.022	U
2,4-DIMETHYLPHENOL	NE	1200	1220	0.027	U	0.15	U	0.031	U	0.029	U
2,4-DINITROPHENOL	NE	120	122	0.43	U	2.3	UJ	0.21	U	0.2	U
2,4-DINITROTOLUENE	NE	1.6	15.7	0.022	U	0.12	U	0.022	U	0.021	U
2,6-DINITROTOLUENE	NE	61	61.1	0.026	U	0.14	U	0.026	U	0.024	U
2-CHLORONAPHTHALENE	NE	6300	6260	0.043	U	0.23	U	0.028	U	0.026	U
2-CHLOROPHENOL	NE	390	391	0.022	U	0.12	U	0.025	U	0.024	U
2-METHYLNAPHTHALENE	NE	230	NE	0.022	U	0.12	U	0.025	U	0.023	U
2-METHYLPHENOL	NE	3100	NE	0.022	U	0.12	U	0.026	U	0.025	U
2-NITROANILINE	NE	610	NE	0.043	U	0.23	U	0.031	U	0.03	U
2-NITROPHENOL	NE	NE	NE	0.022	U	0.12	U	0.032	U	0.03	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	0.043	U	0.23	U	0.036	U	0.034	U
3-NITROANILINE	NE	NE	NE	0.043	U	0.23	U	0.03	U	0.028	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	0.087	U	0.47	U	0.085	U	0.08	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.022	U	0.12	U	0.027	U	0.025	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	0.022	U	0.12	U	0.023	U	0.022	U
4-CHLOROANILINE	NE	2.4	NE	0.022	UJ	0.12	U	0.032	U	0.03	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.022	U	0.12	U	0.022	U	0.021	U
4-NITROANILINE	NE	24	NE	0.043	U	0.23	U	0.045	U	0.043	U
4-NITROPHENOL	NE	NE	NE	0.17	U	0.93	U	0.17	U	0.16	U
ACENAPHTHENE	NE	3400	3440	0.022	U	0.12	U	0.025	U	0.024	U
ACENAPHTHYLENE	NE	NE	NE	0.022	U	0.12	U	0.025	U	0.023	U
ACETOPHENONE	NE	7800	7820	0.022	U	0.163	J	0.025	U	0.024	U
ANTHRACENE	NE	17000	17200	0.022	U	**0.125**	J	0.021	U	0.02	U
ATRAZINE	NE	2.1	NE	0.022	U	0.12	U	0.021	U	0.02	U

Table 4-1
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-IS-0011-062512		OTC533-SL-0001-062712		OTC533-CS-0001-092612		OTC533-CS-0002-092612	
			Sample Date	6/25/2012		6/27/2012		9/26/2012		9/26/2012	
			Location	OTC533-Station 4, leach field, OTC533-MW01		Septic tank sludge		Beneath septic tank		Beneath septic tank	
			Depth (ft bgs)	23 - 25		0 - 1		0 - 0.5		4.5 - 5	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)											
BENZALDEHYDE	NE	7800	NE	0.22	U	1.2	U	0.21	UJ	0.2	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.022	U	**0.668**	J	**0.0309**	J	0.02	U
BENZO(A)PYRENE	NE	0.015	0.148	0.022	U	**0.661**	J	**0.0238**	J	0.02	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.022	U	**0.821**	J	**0.0257**	J	0.02	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.022	U	**0.504**	J	0.021	U	0.02	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.022	U	**0.54**	J	**0.0257**	J	0.024	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.043	U	**0.349**	J	0.042	U	0.04	U
BIPHENYL	NE	51	57.1	0.022	U	0.12	U	0.029	U	0.027	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.022	U	0.12	U	0.03	U	0.028	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.022	U	0.12	U	0.029	U	0.027	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.087	U	**18.3**		**0.262**	J	0.04	U
CAPROLACTAM	NE	31000	NE	0.069	U	0.37	U	0.023	U	0.022	U
CARBAZOLE	NE	NE	NE	0.022	U	0.12	U	0.024	U	0.022	U
CHRYSENE	NE	15	148	0.022	U	**0.763**	J	**0.0332**	J	0.02	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.022	U	**0.164**	J	0.021	U	0.02	U
DIBENZOFURAN	NE	78	NE	0.022	U	0.12	U	0.022	U	0.02	U
DIETHYL PHTHALATE	NE	49000	48900	0.087	U	0.47	U	0.042	U	0.04	U
DIMETHYL PHTHALATE	NE	611000	611000	0.043	U	0.23	U	0.042	U	0.04	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.087	U	0.47	U	0.042	U	0.04	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.043	U	**1.44**		0.042	U	0.04	U
FLUORANTHENE	NE	2300	2290	0.022	U	**1.17**	J	**0.037**	J	0.02	U
FLUORENE	NE	2300	2290	0.022	U	0.12	U	0.024	U	0.022	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.022	U	0.12	U	0.021	U	0.02	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.043	U	0.23	U	0.023	U	0.022	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.095	U	0.51	UJ	0.029	U	0.028	U
HEXACHLOROETHANE	NE	12	42.8	0.043	U	0.23	U	0.024	U	0.023	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.022	U	**0.49**	J	0.021	U	0.02	U
ISOPHORONE	NE	510	5120	0.022	U	0.12	UJ	0.023	U	0.022	U
M,P-CRESOL	NE	NE	NE	0.031	U	0.17	U	0.044	U	0.042	U
NAPHTHALENE	NE	3.6	43.0	0.035	U	0.19	U	0.022	U	0.02	U
NITROBENZENE	NE	4.8	53.5	0.022	U	0.12	U	0.031	U	0.029	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.022	U	0.12	U	0.023	U	0.022	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.022	U	0.12	U	0.042	U	0.04	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.26	U	1.4	U	0.17	U	0.16	U
PHENANTHRENE	NE	1830	1830	0.022	U	**0.508**	J	0.021	U	0.02	U
PHENOL	NE	18000	18300	0.022	U	0.12	U	0.035	U	0.033	U
PYRENE	NE	1700	1720	0.022	U	**1.02**	J	**0.0339**	J	0.02	U

Table 4-1
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-IS-0011-062512		OTC533-SL-0001-062712		OTC533-CS-0001-092612		OTC533-CS-0002-092612	
			Sample Date	6/25/2012		6/27/2012		9/26/2012		9/26/2012	
			Location	OTC533-Station 4, leach field, OTC533-MW01		Septic tank sludge		Beneath septic tank		Beneath septic tank	
			Depth (ft bgs)	23 - 25		0 - 1		0 - 0.5		4.5 - 5	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)											
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.066	U	0.073	U	NA		NA	
1,3-DINITROBENZENE	NE	6.10	NE	0.066	U	0.073	U	NA		NA	
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.066	U	0.073	U	NA		NA	
2,4-DINITROTOLUENE	NE	1.60	15.7	0.08	U	0.088	U	NA		NA	
2,6-DINITROTOLUENE	NE	61.0	61.1	0.072	U	0.079	U	NA		NA	
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.066	U	0.073	U	NA		NA	
2-NITROTOLUENE	NE	2.90	29.1	0.066	U	0.073	U	NA		NA	
3-NITROTOLUENE	NE	6.10	7.82	0.066	U	0.073	U	NA		NA	
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.066	U	0.073	U	NA		NA	
4-NITROTOLUENE	NE	30.0	244.4	0.084	U	0.092	U	NA		NA	
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.170	U	0.073	U	NA		NA	
NITROBENZENE	NE	4.80	53.5	0.077	U	0.085	U	NA		NA	
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.066	U	0.073	U	NA		NA	
TETRYL	NE	240.0	244.0	0.066	U	0.073	U	NA		NA	
PCBS (mg/kg)											
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0086	U	0.012	U	0.0085	U	0.0078	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.011	U	0.014	U	0.011	U	0.0098	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.011	U	0.014	U	0.011	U	0.0098	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0086	U	0.012	U	0.0085	U	0.0078	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0086	U	0.012	U	0.0085	U	0.0078	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0086	U	**0.2**		0.0085	U	0.0078	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0086	U	0.012	U	0.0085	U	0.0078	U
METALS (mg/kg)											
ALUMINUM	13722	77000	78000	**13700**		**9330**		NA		NA	
ANTIMONY	1.6	31	31.3	1.2	U	**2.5**	J	NA		NA	
ARSENIC	3.7	0.39	3.90	**3.1**	J	**6.4**	J	NA		NA	
BARIUM	169.3	15000	15600	**114**	J	**669**		NA		NA	
BERYLLIUM	1.6	160	156	**0.91**	J	0.82	U	NA		NA	
CADMIUM	0.3	70	70.3	0.62	U	**15.1**		NA		NA	
CALCIUM	317332	NE	NE	**159000**		**109000**		NA		NA	
CHROMIUM[d]	25	117000	117000	**16**		**59.1**		NA		NA	
COBALT	7.7	23	NE	**5.3**	J	**5.9**	J	NA		NA	
COPPER	13	3100	3130	**11.3**	J	**480**		NA		NA	
IRON	23049	55000	54800	**14400**		**31500**		NA		NA	
LEAD	10.9	400	400	**8.7**	J	**158**		NA		NA	
MAGNESIUM	16991	NE	NE	**8050**		**7430**		NA		NA	
MANGANESE	393	1800	1860	**164**		**246**		NA		NA	
MERCURY	0.0108	10	15.6	**0.016**	J	**12.7**		NA		NA	
NICKEL	17.4	1500	1560	**13.9**	J	**68.8**		NA		NA	
POTASSIUM	5077	NE	NE	**3000**	J	**1550**	J	NA		NA	

Table 4-1
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC533-IS-0011-062512		OTC533-SL-0001-062712		OTC533-CS-0001-092612		OTC533-CS-0002-092612	
				Sample Date		6/25/2012		6/27/2012		9/26/2012		9/26/2012	
				Location		OTC533-Station 4, leach field, OTC533-MW01		Septic tank sludge		Beneath septic tank		Beneath septic tank	
				Depth (ft bgs)		23 - 25		0 - 1		0 - 0.5		4.5 - 5	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ		
METALS - continued (mg/kg)													
SELENIUM	1.4	390	391	2.5	U	**5.8**	J	NA		NA			
SILVER	1.1	390	391	0.62	U	**27**		NA		NA			
SODIUM	5200	NE	NE	**937**	J	900	U	NA		NA			
THALLIUM	1.3	0.78	0.782	1.6	U	2.1	U	NA		NA			
VANADIUM	42.6	390	391	**23.9**	J	**43**		NA		NA			
ZINC	54.6	23000	23500	**43.3**		**3120**		NA		NA			
PETROLEUM HYDROCARBONS (mg/kg)													
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	2.8	U	6.2	U	4.1	U	3	U		
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	4.2	U	**371**		NA		NA			
OIL RANGE ORGANICS C28-C40	NE	NE	1000	4.2	U	**1060**		NA		NA			
CYANIDE (mg/kg)													
CYANIDE	NE	22.0	46.9	0.074	U	**0.18**	J	NA		NA			
TRITIUM (pCi/g)													
TRITIUM	NE	NE	NE	4.88	U	5.77	U	4.92	U	4.93	U		

Table 4-1
Soil Analytical Data
Buidling 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

ft bgs = feet below ground surface
EPA = Environmental Protection Agency
FD = field duplicate
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NA = not analyzed
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Table 4-2
Groundwater Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-GW-5331-070412	
			Sample date	7/4/2012	
			Location	OTC533-MW01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NMWQCC WQS [c]**	Result	VQ
TOTAL DISSOLVED SOLIDS (mg/L)	NE	NE	10,000	**4190**	
VOLATILES (µg/L)					
1,1,1-TRICHLOROETHANE	NE	200	60	0.2	U
1,1,2,2-TETRACHLOROETHANE	NE	NE	10	0.23	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	NE	NE	0.47	U
1,1,2-TRICHLOROETHANE	NE	5	10	0.22	U
1,1-DICHLOROETHANE	NE	NE	25	0.25	U
1,1-DICHLOROETHENE	NE	7	5	0.23	U
1,2,4-TRICHLOROBENZENE	NE	70	NE	0.5	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.2	NE	0.5	U
1,2-DIBROMOETHANE	NE	0.05	0.10	0.37	U
1,2-DICHLOROBENZENE	NE	600	NE	0.25	U
1,2-DICHLOROETHANE	NE	5	10	0.2	U
1,2-DICHLOROPROPANE	NE	5	NE	0.25	U
1,3-DICHLOROBENZENE	NE	NE	NE	0.2	U
1,4-DICHLOROBENZENE	NE	75	NE	0.23	U
2-HEXANONE	NE	NE	NE	4	U
ACETONE	NE	NE	NE	10	UJ
BENZENE	NE	5	10	0.2	U
BROMODICHLOROMETHANE	NE	80	NE	0.2	U
BROMOFORM	NE	80	NE	0.2	U
BROMOMETHANE	NE	NE	NE	0.5	U
CARBON DISULFIDE	NE	NE	NE	0.5	U
CARBON TETRACHLORIDE	NE	5	10	0.25	U
CHLOROBENZENE	NE	100	NE	0.2	U
CHLOROETHANE	NE	NE	NE	0.5	U
CHLOROFORM	NE	80	100	**0.32**	J

Table 4-2
Groundwater Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-GW-5331-070412	
			Sample date	7/4/2012	
			Location	OTC533-MW01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NMWQCC WQS [c]**	Result	VQ
VOLATILES - continued (µg/L)					
CHLOROMETHANE	NE	NE	NE	2	U
CIS-1,2-DICHLOROETHYLENE	NE	70	NE	0.26	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	0.2	U
CYCLOHEXANE	NE	NE	NE	0.31	U
DIBROMOCHLOROMETHANE	NE	80	NE	0.2	U
DICHLORODIFLUOROMETHANE	NE	NE	NE	0.5	UJ
ETHYLBENZENE	NE	700	750	0.2	U
ISOPROPYLBENZENE	NE	NE	NE	0.2	U
METHYL ACETATE	NE	NE	NE	5	U
METHYL ETHYL KETONE	NE	NE	NE	2	U
METHYL ISOBUTYL KETONE	NE	NE	NE	2	U
METHYLCYCLOHEXANE	NE	NE	NE	0.38	U
METHYLENE CHLORIDE	NE	5	100	2	U
STYRENE	NE	100	NE	0.2	U
TERT-BUTYL METHYL ETHER	NE	NE	NE	0.34	U
TETRACHLOROETHYLENE	NE	5	20	0.25	U
TOLUENE	NE	1000	750	0.2	U
TRANS-1,2-DICHLOROETHENE	NE	100	NE	0.35	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.2	U
TRICHLOROETHYLENE	NE	5	100	**0.54**	J
TRICHLOROFLUOROMETHANE	NE	NE	NE	0.5	U
VINYL CHLORIDE	NE	2	1	0.22	U
XYLENES, TOTAL	NE	10000	620	0.52	U

Table 4-2
Groundwater Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-GW-5331-070412	
			Sample date	7/4/2012	
			Location	OTC533-MW01	
	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NMWQCC WQS [c]	Result	VQ
SEMIVOLATILES (µg/L)					
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	0.52	U
2,4,5-TRICHLOROPHENOL	NE	NE	NE	0.48	U
2,4,6-TRICHLOROPHENOL	NE	NE	NE	0.48	U
2,4-DICHLOROPHENOL	NE	NE	NE	0.48	U
2,4-DIMETHYLPHENOL	NE	NE	NE	1.1	U
2,4-DINITROPHENOL	NE	NE	NE	9.6	U
2,4-DINITROTOLUENE	NE	NE	NE	0.48	U
2,6-DINITROTOLUENE	NE	NE	NE	0.48	U
2-CHLORONAPHTHALENE	NE	NE	30	0.48	U
2-CHLOROPHENOL	NE	NE	NE	0.48	U
2-METHYLNAPHTHALENE	NE	NE	30	0.55	U
2-METHYLPHENOL (O-CRESOL)	NE	NE	NE	0.52	U
2-NITROANILINE	NE	NE	NE	0.48	U
2-NITROPHENOL	NE	NE	NE	0.52	U
3,3'-DICHLOROBENZIDINE	NE	NE	NE	0.96	U
3-NITROANILINE	NE	NE	NE	0.48	U
4,6-DINITRO-2-METHYLPHENOL	NE	NE	NE	1.9	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.48	U
4-CHLORO-3-METHYLPHENOL	NE	NE	NE	0.48	U
4-CHLOROANILINE	NE	NE	NE	0.48	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.48	U
4-NITROANILINE	NE	NE	NE	0.48	U
4-NITROPHENOL	NE	NE	NE	4.8	U
ACENAPHTHENE	NE	NE	30	0.48	U
ACENAPHTHYLENE	NE	NE	30	0.48	U
ACETOPHENONE	NE	NE	NE	0.49	U
ANTHRACENE	NE	NE	30	0.48	U

Table 4-2
Groundwater Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-GW-5331-070412	
			Sample date	7/4/2012	
			Location	OTC533-MW01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NMWQCC WQS [c]**	Result	VQ
SEMIVOLATILES - continued (µg/L)					
ATRAZINE	NE	3	NE	0.65	U
BENZALDEHYDE	NE	NE	NE	4.8	U
BENZO(A)ANTHRACENE	NE	NE	30	0.48	U
BENZO(A)PYRENE	NE	0.2	0.7	0.48	U
BENZO(B)FLUORANTHENE	NE	NE	30	0.48	U
BENZO(G,H,I)PERYLENE	NE	NE	30	0.48	U
BENZO(K)FLUORANTHENE	NE	NE	30	0.48	U
BENZYL BUTYL PHTHALATE	NE	NE	NE	1.1	U
BIPHENYL	NE	NE	NE	0.48	U
BIS(2-CHLOROETHOXY) METHANE	NE	NE	NE	0.48	U
BIS(2-CHLOROETHYL) ETHER	NE	NE	NE	0.52	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	6	NE	1.1	U
CAPROLACTAM	NE	NE	NE	3.8	U
CARBAZOLE	NE	NE	NE	0.48	U
CHRYSENE	NE	NE	30	0.48	U
DIBENZ(A,H)ANTHRACENE	NE	NE	30	0.5	U
DIBENZOFURAN	NE	NE	NE	0.48	U
DIETHYL PHTHALATE	NE	NE	NE	1.1	U
DIMETHYL PHTHALATE	NE	NE	NE	0.95	U
DI-N-BUTYL PHTHALATE	NE	NE	NE	0.84	U
DI-N-OCTYLPHTHALATE	NE	NE	NE	1.1	U
FLUORANTHENE	NE	NE	NE	0.48	U
FLUORENE	NE	NE	NE	0.48	U
HEXACHLOROBENZENE	NE	1	NE	0.54	U
HEXACHLOROBUTADIENE	NE	NE	NE	0.96	U
HEXACHLOROCYCLOPENTADIENE	NE	50	NE	1.8	U
HEXACHLOROETHANE	NE	NE	NE	0.96	U

Table 4-2
Groundwater Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-GW-5331-070412	
			Sample date	7/4/2012	
			Location	OTC533-MW01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NMWQCC WQS [c]**	Result	VQ
SEMIVOLATILES - continued (µg/L)					
INDENO(1,2,3-C,D)PYRENE	NE	NE	30	0.48	U
ISOPHORONE	NE	NE	NE	0.48	UJ
M,P-CRESOL	NE	NE	NE	1.1	U
NAPHTHALENE	NE	NE	30	0.77	U
NITROBENZENE	NE	NE	NE	0.57	U
N-NITROSODI-N-PROPYLAMINE	NE	NE	NE	0.48	U
N-NITROSODIPHENYLAMINE	NE	NE	NE	0.96	U
PENTACHLOROPHENOL	NE	1	NE	5.2	U
PHENANTHRENE	NE	NE	30	0.48	U
PHENOL	NE	NE	NE	0.48	U
PYRENE	NE	NE	30	0.48	U
EXPLOSIVES (mg/kg)					
1,3,5-TRINITROBENZENE	NE	NE	NE	0.076	U
1,3-DINITROBENZENE	NE	NE	NE	0.092	U
2,4,6-TRINITROTOLUENE	NE	NE	NE	0.076	U
2,4-DINITROTOLUENE	NE	NE	NE	0.076	U
2,6-DINITROTOLUENE	NE	NE	NE	0.076	U
2-AMINO-4,6-DINITROTOLUENE	NE	NE	NE	0.076	U
2-NITROTOLUENE	NE	NE	NE	0.076	U
3-NITROTOLUENE	NE	NE	NE	0.076	U
4-AMINO-2,6-DINITROTOLUENE	NE	NE	NE	0.078	U
4-NITROTOLUENE	NE	NE	NE	0.076	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	NE	NE	0.076	U
NITROBENZENE	NE	NE	NE	0.08	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	NE	NE	0.076	U
TETRYL	NE	NE	NE	0.076	U

Table 4-2
Groundwater Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-GW-5331-070412	
			Sample date	7/4/2012	
			Location	OTC533-MW01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NMWQCC WQS [c]**	Result	VQ
METALS (µg/L)					
ALUMINUM	1043	NE	NE	**582**	
ANTIMONY	6	6	NE	4	U
ARSENIC	10	10	100	**2.8**	J
BARIUM	38	2000	1000	**22.7**	J
BERYLLIUM	4	4	NE	1	U
CADMIUM	5	5	10	2	U
CALCIUM	1,136,664	NE	NE	**524000**	
CHROMIUM, TOTAL	12	100	50	2	U
COBALT	36	NE	NE	1	U
COPPER	9.8	1300	1000	**2.2**	J
IRON	300	NE	1000	**443**	
LEAD	9	15	50	2	U
MAGNESIUM	3,692,782	NE	NE	**264000**	
MANGANESE	50	NE	200	**49.7**	
MERCURY	0.5	2	2	0.05	U
NICKEL	22	NE	NE	**5.1**	J
POTASSIUM	212,144	NE	NE	**7500**	J
SELENIUM	50	50	50	4	U
SILVER	10	NE	50	1	U
SODIUM	20,989,580	NE	NE	**274000**	
THALLIUM	2	2	NE	3.7	U
VANADIUM	90	NE	NE	**19.7**	J
ZINC	17	NE	10000	10	U

Table 4-2
Groundwater Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-GW-5331-070412	
			Sample date	7/4/2012	
			Location	OTC533-MW01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NMWQCC WQS [c]**	Result	VQ
PCBs (mg/kg)					
PCB-1016 (AROCHLOR 1016)	NE	NE	1	0.19	U
PCB-1221 (AROCHLOR 1221)	NE	NE	1	0.24	U
PCB-1232 (AROCHLOR 1232)	NE	NE	1	0.24	U
PCB-1242 (AROCHLOR 1242)	NE	NE	1	0.19	U
PCB-1248 (AROCHLOR 1248)	NE	NE	1	0.19	U
PCB-1254 (AROCHLOR 1254)	NE	NE	1	0.19	U
PCB-1260 (AROCHLOR 1260)	NE	NE	1	0.19	U
PETROLEUM HYDROCARBONS (µg/L)					
GASOLINE RANGE ORGANICS C6-C10	NE	NE	See individual VOC & SVOC	50	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	400	95	U
OIL RANGE ORGANICS C28-C40	NE	NE	200	95	U
CYANIDE (µg/L)					
CYANIDE	NE	200	200	5	U
TRITIUM (pCi/L)					
TRITIUM	NE	NE	NE	614	U

Table 4-2
Groundwater Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NM WQCC Water Quality Standard

Value exceeds EPA Maximum Contaminant Level

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," letter to D. Scruggs, Chief, Environmental Restoration Program, Holloman Air Force Base from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, New Mexico Environment Department, March 1.*

[b] *U.S. Environmental Protection Agency (EPA), 2012, National Primary Drinking Water Regulations: List of Drinking Water Contaminants and Maximum Contaminant Levels.*

[c] *New Mexico Water Quality Control Commission, Water Quality Standards, 20.6.2 New Mexico Administrative Code.*

[d]New Mexico Environment Department (NMED), 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, New Mexico Environment Department, Santa Fe, New Mexico, February, Table 6-2. TPH Screening Guidelines for Potable Groundwater (GW-1), February 2012, Table A-1: NMED Soil Screening Levels, updated June 2012. "Unknown oil" criteria used for Oil Range Oraganics.

EPA = Environmental Protection Agency

GW = groundwater

J = estimated value

MCL = Maximum Contaminant Level

µg/L = micrograms per liter

mg/L = milligrams per liter

MW = monitoring well

NE = not established

NMED = New Mexico Environment Department

NMWQCC= New Mexico Water Quality Control Commission

pCi/L = picocuries per liter

RCRA = Resource Conservation and Recovery Act

RFI = RCRA Facility Investigation

SVOC = semivolatile organic compound

U = not detected at the detection limit shown

VOC = volatile organic compound

VQ = validation qualifier

WQS = Water Quality Standard

Table 4-3
Investigation-Derived Waste - Soil Analytical Data
Building 1190 (OT-C513) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	LDY-IDW01-090412		OTC533-WC-0001-072512	
		Sample Date	9/4/2012		7/25/2012	
		Sample Type	Waste Characterization		Waste Characterization	
		40 CFR 261 Waste Characteristic Criteria	Result	VQ	Result	VQ
General Chemistry						
Corrosivity as pH	pH Units	> 2 and < 12.5	**7.7**		**7.2**	
Cyanide Reactivity	mg/kg	< 250	1.5	U	1.8	U
Ignitability (Flashpoint)	°F	> 140 °F	>200		**>200**	
Solids, Percent	%	NE	**84.4**		**54.2**	
Sulfide Reactivity	mg/kg	< 500	59	U	92	U
TCLP Volatiles						
Benzene	mg/L	0.5	0.0020	U	0.002	U
Chlorobenzene	mg/L	100	0.0020	U	0.002	U
Chloroform	mg/L	6	0.0022	U	0.0022	U
Carbon tetrachloride	mg/L	0.5	0.0025	U	0.0025	U
1,1-Dichloroethylene	mg/L	0.7	0.0023	U	0.0023	U
1,2-Dichloroethane	mg/L	0.5	0.0020	U	0.002	UJ
p-Dichlorobenzene	mg/L	7.5	0.0023	U	0.0023	U
Methyl ethyl ketone	mg/L	200	0.0020	U	0.02	U
Tetrachloroethylene	mg/L	0.7	0.0025	U	0.0025	U
Trichloroethylene	mg/L	0.5	0.0026	U	0.0026	U
Vinyl chloride	mg/L	0.2	0.0022	U	0.0022	U
TCLP Semivolatiles						
2-Methylphenol	mg/L	200	0.0054	U	0.054	U
3,4-Methylphenol	mg/L	200	0.011	U	0.011	U
Pentachlorophenol	mg/L	100	0.054	U	0.054	U
2,4,5-Trichlorophenol	mg/L	400	0.0050	U	0.005	U
2,4,6-Trichlorophenol	mg/L	2	0.0050	U	0.005	U
1,4-Dichlorobenzene	mg/L	7.5	0.010	U	0.01	U
2,4-Dinitrotoluene	mg/L	0.13	0.0050	U	0.005	U
Hexachlorobenzene	mg/L	0.13	0.0056	U	0.0056	U
Hexachlorobutadiene	mg/L	0.5	0.010	U	0.01	U
Hexachloroethane	mg/L	3	0.010	U	0.01	U
Nitrobenzene	mg/L	2	0.0059	U	0.0059	U
Pyridine	mg/L	100	0.016	U	0.016	U
TCLP Metals						
Arsenic	mg/L	5	0.020	U	0.02	U
Barium	mg/L	100	**0.12**	J	**0.13**	J
Cadmium	mg/L	1	0.010	U	**0.064**	
Chromium	mg/L	5	0.010	U	0.01	U
Lead	mg/L	5	0.010	U	0.01	U
Mercury	mg/L	0.2	0.00050	U	0.0005	U
Selenium	mg/L	1	0.020	U	0.02	U
Silver	mg/L	5	0.010	U	0.01	U

Table 4-3
Investigation-Derived Waste - Soil Analytical Data
Building 1190 (OT-C513) RFI Report
Holloman Air Force Base, New Mexico

Bold = parameter detected.

°F = degrees Fahrenheit
> = greater than
< = less than
% = percent
CFR = Code of Federal Regulations
J = estimated value
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
NE = not established
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
TCLP = Toxicity Characteristic Leaching Procedure
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Table 4-4
Investigation-Derived Waste - Water Analytical Data
Building 1190 (OT-C513) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles				
Acetone	µg/L	NE	10	U
Benzene	µg/L	5	0.21	U
Bromodichloromethane	µg/L	80	0.20	U
Bromoform	µg/L	80	0.34	U
Chlorobenzene	µg/L	100	0.20	U
Chloroethane	µg/L	NE	0.50	U
Chloroform	µg/L	80	0.26	U
Carbon disulfide	µg/L	NE	0.49	U
Carbon tetrachloride	µg/L	5	0.31	U
Cyclohexane	µg/L	NE	0.48	U
1,1-Dichloroethane	µg/L	NE	0.21	U
1,1-Dichloroethylene	µg/L	7	0.20	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.71	U
1,2-Dibromoethane	µg/L	0.05	0.30	U
1,2-Dichloroethane	µg/L	5	0.22	U
1,2-Dichloropropane	µg/L	5	0.26	U
Dibromochloromethane	µg/L	80	0.20	U
Dichlorodifluoromethane	µg/L	NE	0.50	U
cis-1,2-Dichloroethylene	µg/L	70	**0.42**	J
cis-1,3-Dichloropropene	µg/L	NE	0.22	U
m-Dichlorobenzene	µg/L	NE	0.25	U
o-Dichlorobenzene	µg/L	600	0.22	U
p-Dichlorobenzene	µg/L	75	0.20	U
trans-1,2-Dichloroethylene	µg/L	100	0.23	U
trans-1,3-Dichloropropene	µg/L	NE	0.21	U
Ethylbenzene	µg/L	700	0.29	U
Freon 113	µg/L	NE	0.33	U
2-Hexanone	µg/L	NE	2.0	U
Isopropylbenzene	µg/L	NE	0.20	U
4-Methyl-2-pentanone	µg/L	NE	2.3	U
Methyl Acetate	µg/L	NE	5.0	U
Methyl bromide	µg/L	NE	0.79	U
Methyl chloride	µg/L	NE	0.50	U
Methylcyclohexane	µg/L	NE	0.20	U
Methylene chloride	µg/L	5	2.0	U
Methyl ethyl ketone	µg/L	NE	3.1	U
Methyl Tert Butyl Ether	µg/L	NE	0.21	U
Styrene	µg/L	100	0.20	U

Table 4-4
Investigation-Derived Waste - Water Analytical Data
Building 1190 (OT-C513) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles (continued)				
1,1,1-Trichloroethane	µg/L	200	0.20	U
1,1,2,2-Tetrachloroethane	µg/L	NE	0.24	U
1,1,2-Trichloroethane	µg/L	5	0.20	U
1,2,4-Trichlorobenzene	µg/L	70	0.50	U
Tetrachloroethylene	µg/L	5	0.32	U
Toluene	µg/L	1000	0.20	U
Trichloroethylene	µg/L	5	0.31	U
Trichlorofluoromethane	µg/L	NE	0.50	U
Vinyl chloride	µg/L	2	0.44	U
Xylene (total)	µg/L	10000	0.50	U
Semivolatiles				
2-Chlorophenol	µg/L	NE	0.68	U
4-Chloro-3-methyl phenol	µg/L	NE	0.78	U
2,4-Dichlorophenol	µg/L	NE	0.67	U
2,4-Dimethylphenol	µg/L	NE	0.74	U
2,4-Dinitrophenol	µg/L	NE	5.0	U
4,6-Dinitro-o-cresol	µg/L	NE	1.4	U
2-Methylphenol	µg/L	NE	0.69	U
3&4-Methylphenol	µg/L	NE	1.3	U
2-Nitrophenol	µg/L	NE	0.65	U
4-Nitrophenol	µg/L	NE	4.8	U
Pentachlorophenol	µg/L	1	4.8	U
Phenol	µg/L	NE	0.53	U
2,4,5-Trichlorophenol	µg/L	NE	0.86	U
2,4,6-Trichlorophenol	µg/L	NE	0.75	U
Acenaphthene	µg/L	NE	0.67	U
Acenaphthylene	µg/L	NE	0.67	U
Acetophenone	µg/L	NE	0.72	U
Anthracene	µg/L	NE	0.72	U
Atrazine	µg/L	3	0.83	U
Benzaldehyde	µg/L	NE	4.8	U
Benzo(a)anthracene	µg/L	NE	0.52	U
Benzo(a)pyrene	µg/L	0.2	0.55	U
Benzo(b)fluoranthene	µg/L	NE	0.73	U
Benzo(g,h,i)perylene	µg/L	NE	0.64	U
Benzo(k)fluoranthene	µg/L	NE	0.64	U
4-Bromophenyl phenyl ether	µg/L	NE	0.76	U
Butyl benzyl phthalate	µg/L	NE	0.68	U
1,1'-Biphenyl	µg/L	NE	0.92	U
2-Chloronaphthalene	µg/L	NE	0.70	U

Table 4-4
Investigation-Derived Waste - Water Analytical Data
Building 1190 (OT-C513) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Semivolatiles (continued)				
4-Chloroaniline	µg/L	NE	0.66	U
Caprolactam	µg/L	NE	2.4	U
Carbazole	µg/L	NE	0.50	U
Chrysene	µg/L	NE	0.56	U
bis(2-Chloroethoxy)methane	µg/L	NE	0.67	U
bis(2-Chloroethyl)ether	µg/L	NE	0.69	U
bis(2-Chloroisopropyl)ether	µg/L	NE	0.76	U
4-Chlorophenyl phenyl ether	µg/L	NE	0.84	U
2,4-Dinitrotoluene	µg/L	NE	0.66	U
2,6-Dinitrotoluene	µg/L	NE	0.77	U
3,3'-Dichlorobenzidine	µg/L	NE	0.71	U
Dibenzo(a,h)anthracene	µg/L	NE	0.56	U
Dibenzofuran	µg/L	NE	0.72	U
Di-n-butyl phthalate	µg/L	NE	0.96	U
Di-n-octyl phthalate	µg/L	NE	0.96	U
Diethyl phthalate	µg/L	NE	0.96	U
Dimethyl phthalate	µg/L	NE	0.77	U
bis(2-Ethylhexyl)phthalate	µg/L	6	1.1	U
Fluoranthene	µg/L	NE	0.56	U
Fluorene	µg/L	NE	0.73	U
Hexachlorobenzene	µg/L	1	0.66	U
Hexachlorobutadiene	µg/L	NE	0.92	U
Hexachlorocyclopentadiene	µg/L	50	0.76	U
Hexachloroethane	µg/L	NE	0.71	U
Indeno(1,2,3-cd)pyrene	µg/L	NE	0.55	U
Isophorone	µg/L	NE	0.61	U
2-Methylnaphthalene	µg/L	NE	0.66	U
2-Nitroaniline	µg/L	NE	0.72	U
3-Nitroaniline	µg/L	NE	0.62	U
4-Nitroaniline	µg/L	NE	0.93	U
Naphthalene	µg/L	NE	0.61	U
Nitrobenzene	µg/L	NE	0.69	U
N-Nitroso-di-n-propylamine	µg/L	NE	0.82	U
N-Nitrosodiphenylamine	µg/L	NE	0.96	U
Phenanthrene	µg/L	NE	0.68	U
Pyrene	µg/L	NE	0.65	U
Petroleum Hydrocarbons				
Gasoline Range Organics (C6-C10)	mg/L	NE	0.05	U
Diesel Range Organics (C10-C28)	mg/L	NE	**0.115**	J
Oil Range Organics (C28-C40)	mg/L	NE	0.10	U

Table 4-4
Investigation-Derived Waste - Water Analytical Data
Building 1190 (OT-C513) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Metals				
Aluminum	µg/L	NE	**36.2**	J
Antimony	µg/L	6	**6.7**	J
Arsenic	µg/L	10	2.5	U
Barium	µg/L	2000	**29.1**	J
Beryllium	µg/L	4	0.50	U
Cadmium	µg/L	5	1.0	U
Calcium	µg/L	NE	**654,000**	
Chromium	µg/L	100	4	U
Cobalt	µg/L	NE	**6.2**	J
Copper	µg/L	1300	**2.9**	J
Iron	µg/L	NE	**97.5**	J
Lead	µg/L	15	2.2	U
Magnesium	µg/L	NE	**310,000**	
Manganese	µg/L	NE	**179**	
Mercury	µg/L	2	0.03	U
Nickel	µg/L	NE	**3.7**	J
Potassium	µg/L	NE	**16,500**	
Selenium	µg/L	50	4.0	U
Silver	µg/L	NE	0.50	U
Sodium	µg/L	NE	**762,000**	
Thallium	µg/L	2	0.078	U
Vanadium	µg/L	NE	**4.5**	J
Zinc	µg/L	NE	**12.8**	J

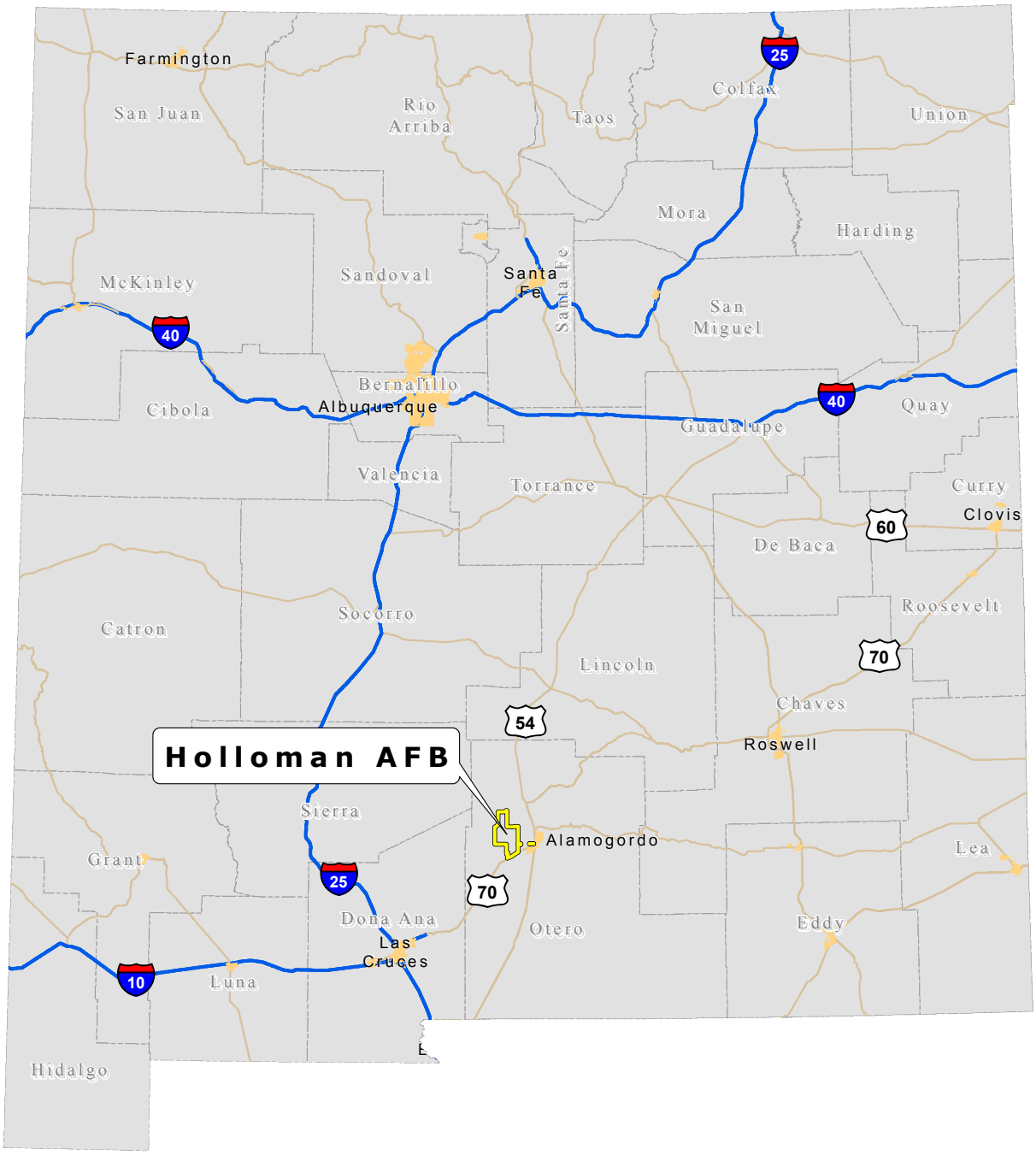
Table 4-4
Investigation-Derived Waste - Water Analytical Data
Building 1190 (OT-C513) RFI Report
Holloman Air Force Base, New Mexico

[a] EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.

Boldface entry = parameter detected.

EPA = Environmental Protection Agency
J = estimated value
MCL = maximum contaminant level
µg/L = micrograms per liter
mg/L = milligrams per liter
NE = not established
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = regional screening level
U = not detected at the detection limit shown
VQ = validation qualifier

Figures



File Path: \\cfsfs01.cfs.com\arcgisprod2\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RifRpt\HafbNmLoc.mxd

Date: 8/28/2013

Approved By: BFoss

Checked By: CLong

Drawn By: BGrod

Office: Hou

Legend

Holloman AFB

N

WGS 84 UTM Zone 13N Meters

0 20 40 80
Kilometers

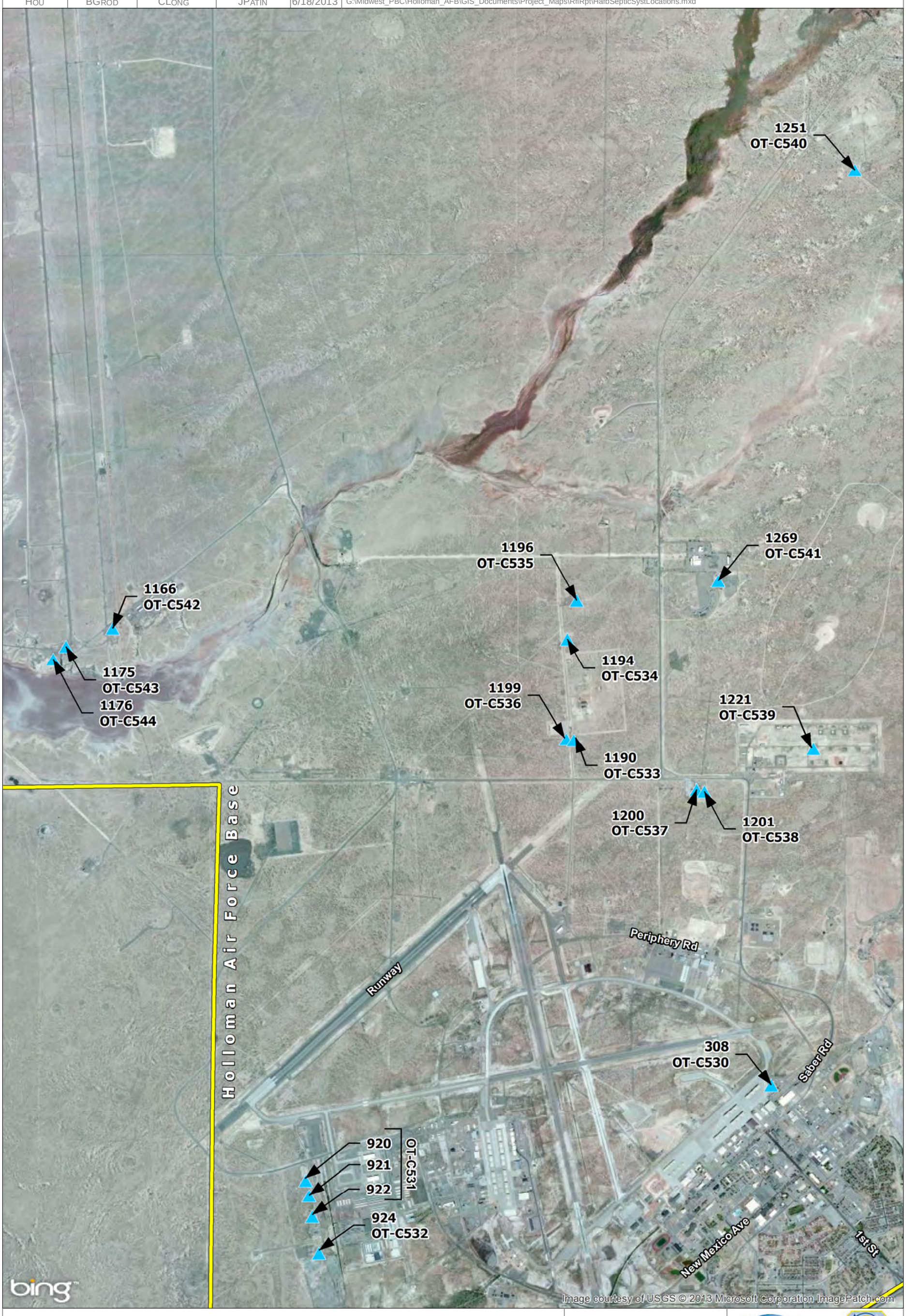
0 10 20 40
Miles

Figure 1-1

Holloman Air Force Base Location

Holloman AFB, New Mexico

Office	Drawn By	Checked By	Approved By	Date	File Path
Hou	BGrod	CLong	JPatin	6/18/2013	G:\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbSepticSystLocations.mxd



LEGEND

- Holloman AFB
- Septic Tank System

N

WGS 84 UTM Zone 13N
Meters

1 inch = 2,800 feet

0 700 1,400 2,800
Feet

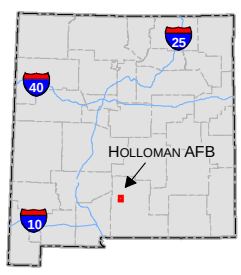
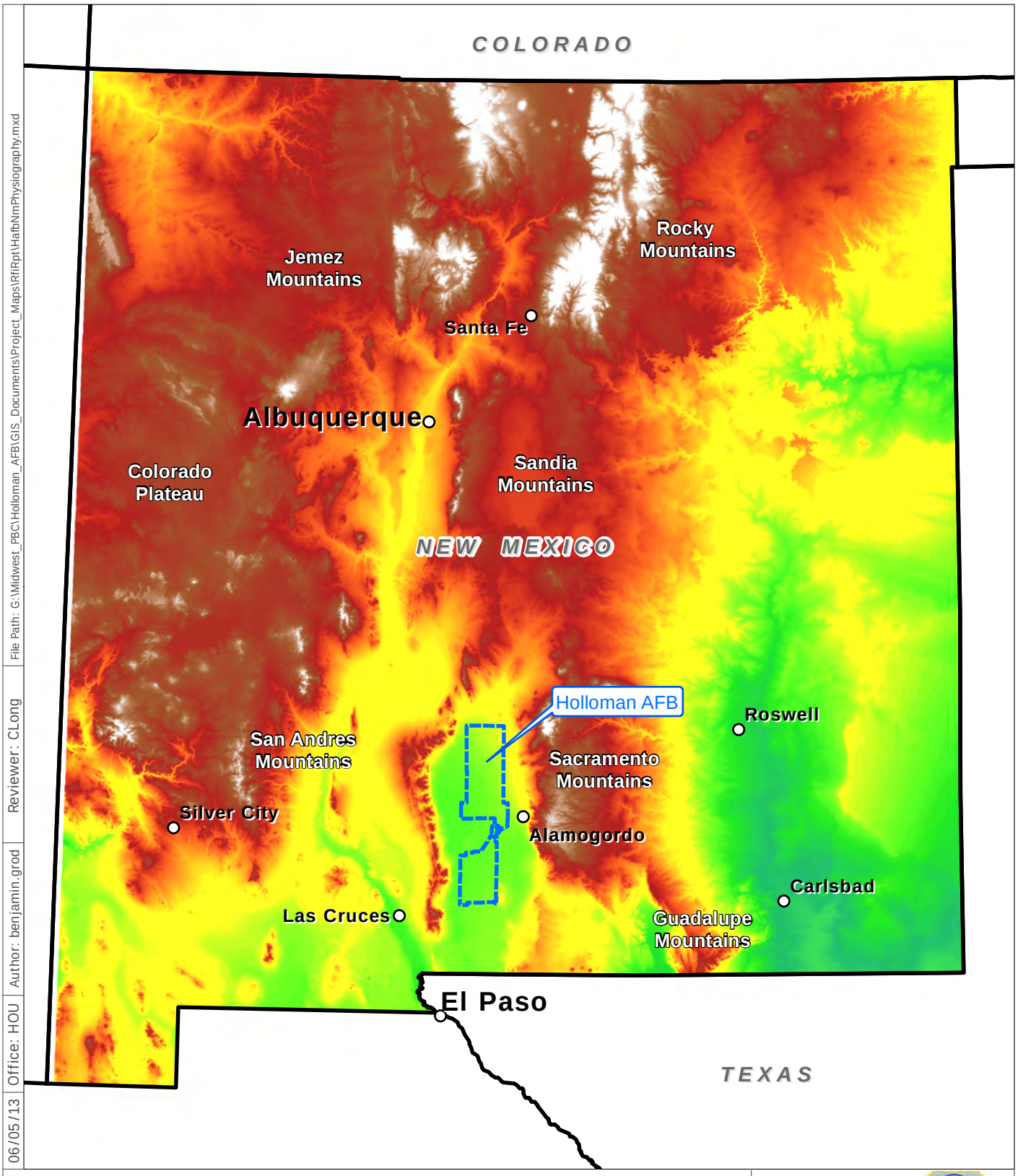


Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
Holloman AFB, NM



File Path: G:\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbNmPhysiography.mxd
Reviewer: CLong
Author: benjamin.grod
Office: HOU
06/05/13

Legend

Holloman Air Force Base (AFB) Installation Area

Elevation
- High : 3,936 meters
- Low : 0 meters

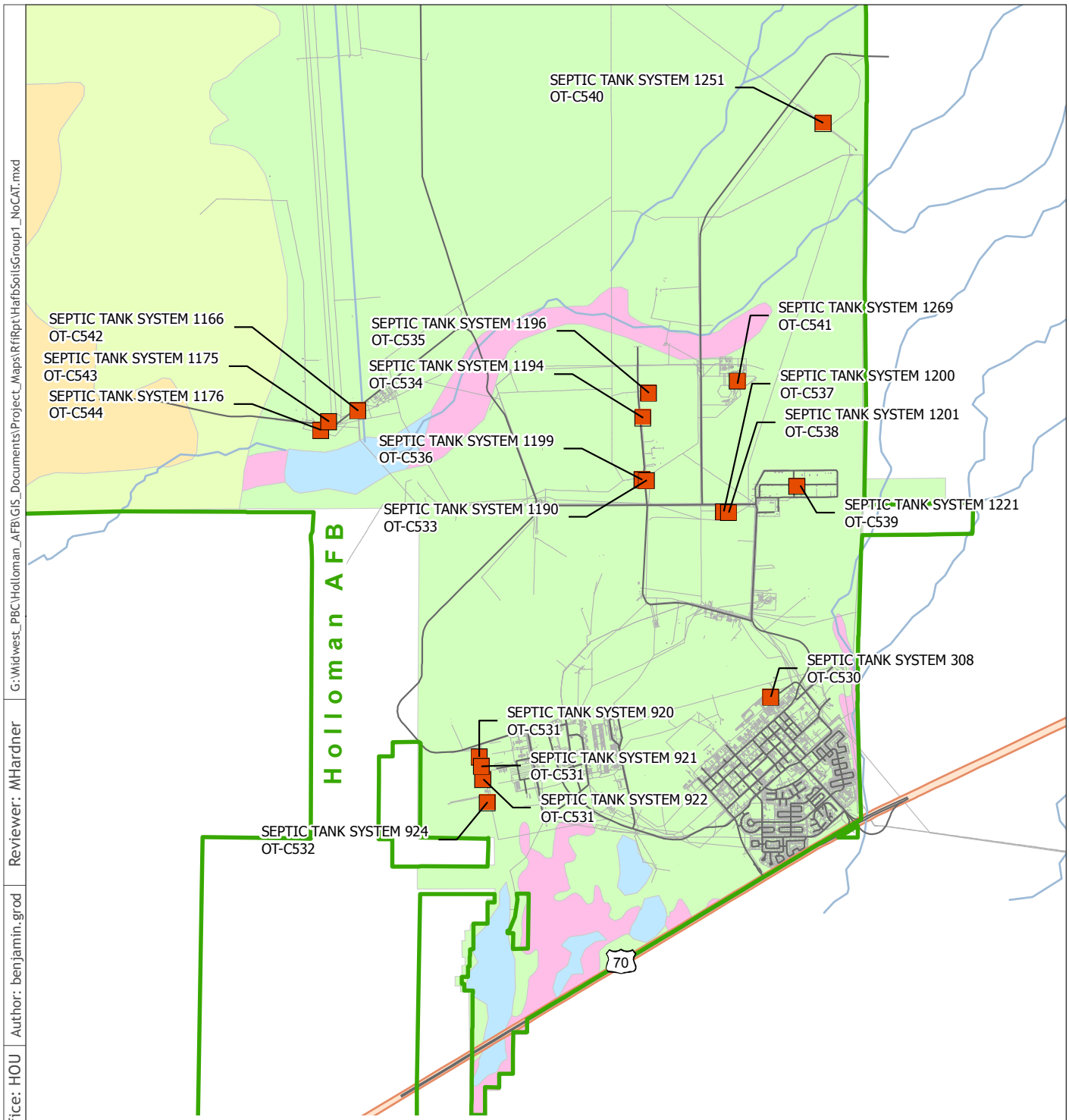
NAD 83 SPCS
New Mexico Central
Feet

0 50
Miles

Figure 2-1

Physiographic Map

Holloman AFB, New Mexico



Note:
1) Soils types at Holloman Air Force Base, New Mexico are based on United States Department of Agriculture (USDA) Soil Conservation Service Classifications. Source USDA, 1981

06/18/13 | Office: HOU | Author: benjamin.grod | Reviewer: MHardner | G:\Widwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbSoilsGroup1_NoCAT.mxd

Legend

- Installation Area
- Group 1 Septic Tank Sites
- Surface Water
- Active Dune Land Gypsum
- Duneland Yesum Association
- Holloman-Gypsum Land-Yesum complex
- Intermittent Water
- Mead Silty Clay Loam
- Rock Land Warm

NAD 83 SPCS
New Mexico Central
Feet

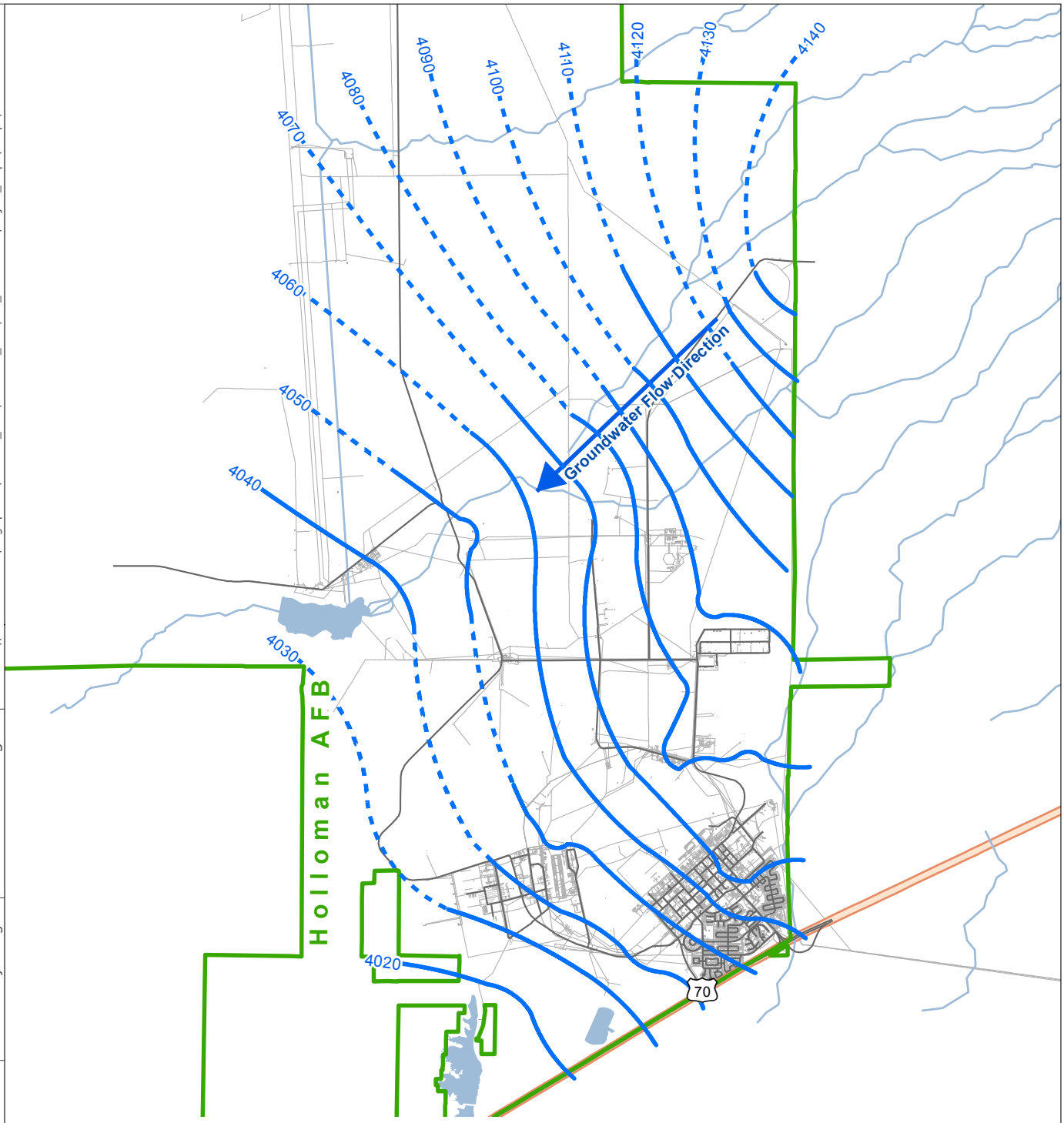
0 7,000
Feet

CBI

Figure 2-2

Septic Systems Soils Map

Holloman AFB, New Mexico



Note:
1) Groundwater contour map showing groundwater elevation contours across Holloman Air Force Base, New Mexico, are based on 2002 measurements taken from the shallow aquifer.
2) Source: Holloman AFB GIS, 2002 LTM.

08/28/13 | Office: HOU | Author: benjamin.grod | Reviewer: CLong | File Path: \\cfsfs01.cfs.com\arcgisprod2\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbGw2002.mxd

Legend

- Installation Area
- Groundwater Flow Direction
- Groundwater Elevation Contour (ft) (Dashed where inferred)
- Surface Water

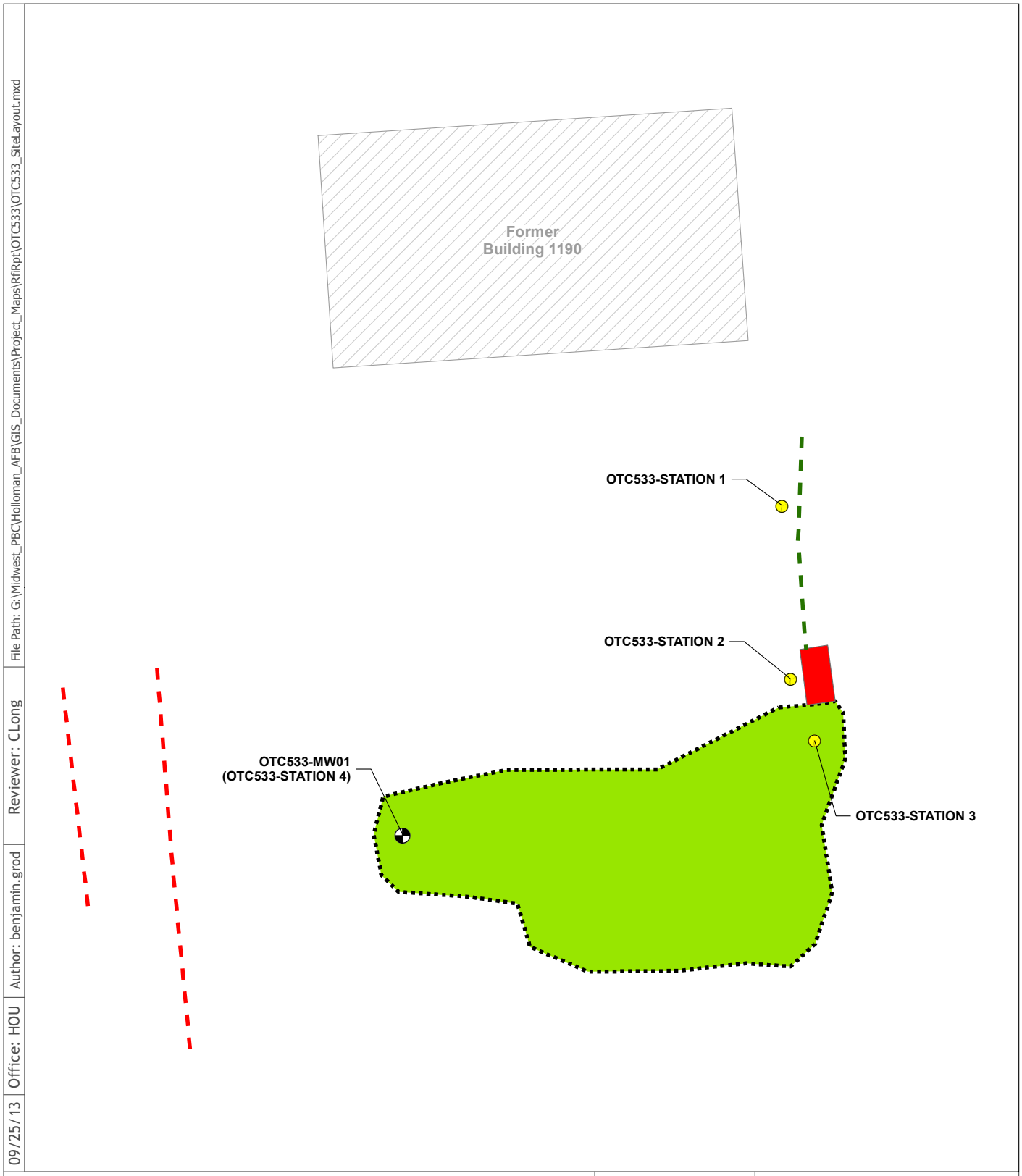
NAD 83 SPCS
New Mexico Central
Feet

0 8,000
Feet

Figure 2-3

Regional Groundwater Contour Map

Holloman AFB, New Mexico



09/25/13 | Office: HOU | Author: benjamin.grod | Reviewer: CLong | File Path: G:\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\OTC533\OTC533_SiteLayout.mxd

Legend

- Monitoring Well
- Soil Boring Station
- Electric or Communication Utility
- Influent Line
- Septic Tank
- Leach Field
- Former Building

N

NAD 83 SPCS
New Mexico Central
Feet

0 25
Feet

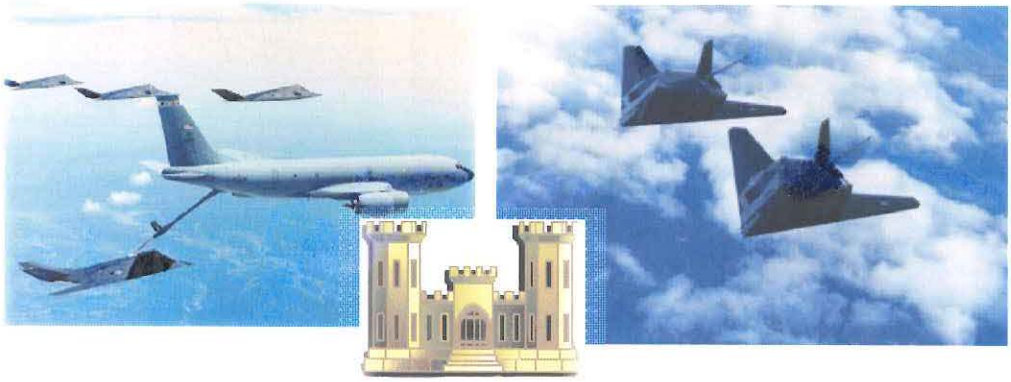
Figure 3-1

Site Layout and
Sampling Locations
Building 1190
Septic Tank System OT-C533

Holloman AFB, New Mexico

Appendix A
Historical Records

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS



Holloman Air Force Base
New Mexico

APRIL 2007

Headquarters, Air Combat Command
Langley Air Force Base, Virginia

49 CES/CEV
Holloman Air Force Base, New Mexico

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH FIGHTER WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

APR 27 2007

MEMORANDUM FOR NEW MEXICO ENVIRONMENT DEPARTMENT
Attn: Mr. James P. Bearzi
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe NM 87505-6303

FROM: 49 CES/CEV
550 Tabosa Ave.
Holloman AFB NM 88330-8458

SUBJECT: Submittal of Information Required by NMED Letter of August 30, 2006
Septic Tanks and Associated Drain Fields, Holloman AFB
EPA ID# NM6572124422

1. Pursuant to Part 4, Condition IV.B.3 of Permit No. NM6572124422, Holloman AFB is submitting the final portion of the required information.

2. This final portion of the required information covers the history of the facilities served by each septic tank and, based on the historic activities that occurred in each facility, the possible wastes that were discharged into the septic systems.

3. If you have any questions or comments, please contact Mr. Dave Griffin or Mr. George Fish at (505) 572-3931.

DEBORAH J. HARTELL
Chief, Environmental Flight

cc: w/Attachments
Mr. Cornelius Amindyas
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

Mr. David Strasser
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS
HISTORY

Holloman's records show a list of fifty seven (57) septic tank systems broken into three categories- Active Septic Systems, Inactive Septic Systems, and Removed Septic Systems. The systems are identified by the Building number they are/were attached to. There are twenty five (25) Active Septic Systems which are listed in this report. There are twenty one (21) Inactive Septic Systems that are listed and the history of activities in the building associated with the system is identified to the extent of available knowledge. There are eleven (11) Removed Septic Systems listed with histories based on available record knowledge.

The Active systems are identified, but no histories of the buildings are provided as this will likely change over time particularly with change in mission (aircraft on base) or tie-in to the base waste water treatment system. A history will be added to this list if and when the septic system is no longer needed and moved to the Inactive or Removed list.

The Inactive systems are scheduled for proper closure per guidance given in the NMED Liquid Waste Regulation 20.7.3.307 NMAC. This regulation calls for capping of the line(s) from the building to the septic tank, pumping out the tanks contents, penetration of the bottom of the tank, along with collapse of the tank roof and filling of the tank with sand or soil.

The septic systems on the Removed list have had the actual septic tank excavated and removed.

A search of Real Property records and the Historic Properties Inventory yielded the information available on the buildings. There was not information available on every building, but if new information becomes available, it will be added to the list.

Attachment 54a-e shows the current plan of where the sewer system lies to show what buildings are currently connected to Holloman's Sewer System. Any building that does not have an active septic tank is either abandoned or connect to Holloman's Sewer System.

ACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	149	1998		1000
2	312	1994		1000
3	375	1968		500
4	882			
5	864 (863)	1994	5'x8'x6'4"	750
6	885	1970	7'10"x4'8"x6'10"	1000
7	886			
8	887	1991		1000
9	923	1959	4'2"x7"x7'9.5"	1600
10	1022	1992		1200
11	1066	1994		1000
12	1160	1957	5'x12'4"x7'6"	1500
13	1161	1957		750
14	1162	1957		350
15	1163	1957		350
16	1169	1962		1680
17	1195	1962		1260
18	1256	1970	12'8"x4'8"x5'	
19	1270			
20	1271			
21	1278	2004		1250
22	1284			
23	1625			
24	75600	1989		1200
25	La Luz Gate (1290)(**1292**)	2004		1250

INACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	308	1965		
2	920	1959	4'2"x7"x7'9.5"	1600
3	921	1959	4'2"x7"x7'9.5"	1600
4	922	1959	4'2"x7"x7'9.5"	1600
5	924	1959	4'2"x7"x7'9.5"	1600
6	1091	1969	6'8"x3'x8'5"	
7	1097	1987	5'10"x5'x7'8"	1672
8	1190	1952	9'x4'x8'10"	3000
9	1194	1987	4'x4'x8'10"	1350
10	1196	1993	4'6"x11'x6'	1300
11	1199	1957		500
12	1200	1954	4'x8'x4'	1000
13	1201	1951	2'6"x6'6"x5'5"	650
14	1219	1985	5'4"x10'6"x8'4"	
15	1221	1983	4'8"x9'4"x6'2"	1100
16	1226	1985	5'6'2"x6'	
17	1235	1986		1189
18	1239	1977	4'6"x8'6"x6'	750
19	1250	1957		350
20	1251			
21	1269	1966	4'6"x9'	500

INACTIVE SEPTIC SYSTEMS

BUILDING 308

This is a 3200 SF building originally constructed in 1965. The original operation in the building was calibration of guided weapons for aircraft. In the 1970s and early 1980s the building was used as a nosedock for F-4 - Test Aircraft Radar electronic work area. It has never had a floor drain.
This facility is currently being used to store air craft support equipment for Building 309. The shop has been used in the past for servicing, inspecting, and repairing AGE equipment, but due to the reduction in personnel, this work is currently only performed in Building 309. The need to expand the work area for AGE equipment maintenance into Building 308 in the near future is not anticipated. A current view of the building is shown below in Figure 1.

Figure 1: Picture of Bldg. 308

Facilities associated with the septic system consist of:

- Toilet
- Lavatory
- Janitorial Sink

The building is located at 340 Delaware Ave. The point of contact for this building is Ms. Vicky Cruz and Mr. Adam Ferrara, they can be reached at 575-~~475~~-5272. The hours

572

of operation for this building when it is in use is one 8.5 hr shift (0630-1500) and one 9 hr shift (1500-2400), five days per week.

Industrial Wastewater Drainage: There are no floor or trench drains in this facility. A janitor's sink is located in the restroom. The sanitary sewer pipe from the restroom connects with the pipe from the restrooms in Building in 309. The effluent pipe then proceeds south to Manhole 334E the layout of this facility can be seen below in **Figure 2**. At the time of the inspection surveyors were unable to open Manhole 334E. No cross-connections to the storm sewer were identified.

Industrial Wastewater Sources/Existing Pretreatment/ Existing Management Practices: There is only once source of industrial wastewater from this facility: floor washing

Floor Washing: The floor in this facility is washed every three months using a Tennant floor scrubber, 10 gallons of water and Simple Green. Average and maximum daily wastewater flows from this activity are estimated to be less than one gallon and ten gallons, respectively. The wastewater from this activity is discharged into the French drain at Building 309; therefore, the quantity of wastewater generated by this activity is included in the flow summary for Building 309.

Existing management practices consist of sweeping the floor prior to washing it.

Site Description: Aircraft Corrosion Control
Site Specific Contingency Action Plan: See Attachment 1
Secondary Containment Routes: None
Probable Spill Route: Leaks dissipate in local area on ground
Material Compatibility: No material incompatibilities

Connected to Sewer?

Stored Substances:

Chemical	Container Type
MEK	1 gallon can
Polyurethane Paint	1 gallon can
Naptha	1 gallon can
Toluene	1 gallon can
Epoxy Primer	1 gallon can
PD-680 Type II	55 gallon drum
Waste Paint/Thinners	55 gallon drum

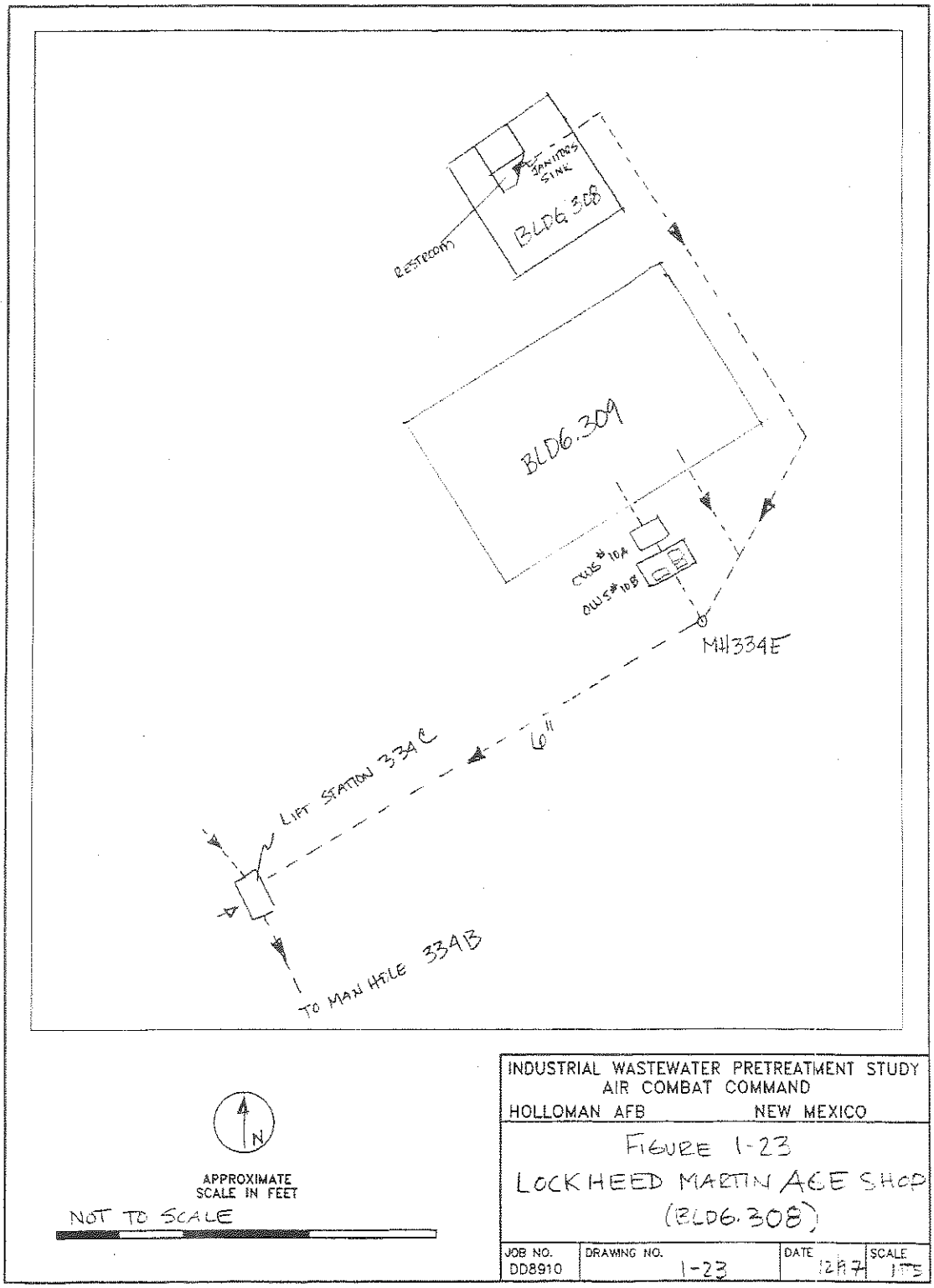


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Figure 2: Layout of Bldg. 308 and 309

INACTIVE SEPTIC SYSTEMS

BUILDINGS 920, 921, 922

These are three identical buildings constructed in 1959. Each building has 1900 SF. They were originally built for ammunition assembly which primarily consisted of bolting rocket components together prior to use. All three buildings are presently vacant and empty.
Each of the three buildings has a simple bathroom consisting of a:

- Toilet
- Lavatory

Multiple inspections were set up for this site, but no one showed up. Therefore, no follow-up information was found. Pictures of the current buildings are shown below in Figures 3-5.

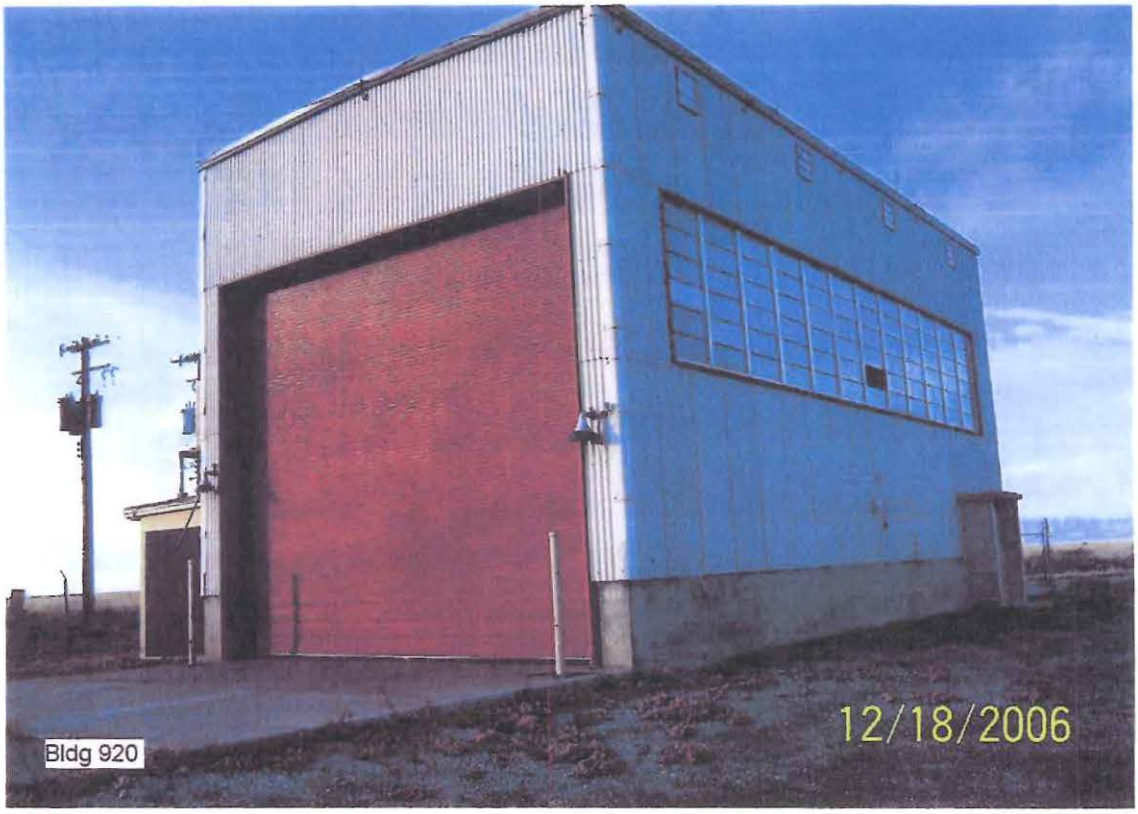


Figure 3: Pictures of Bldg. 920

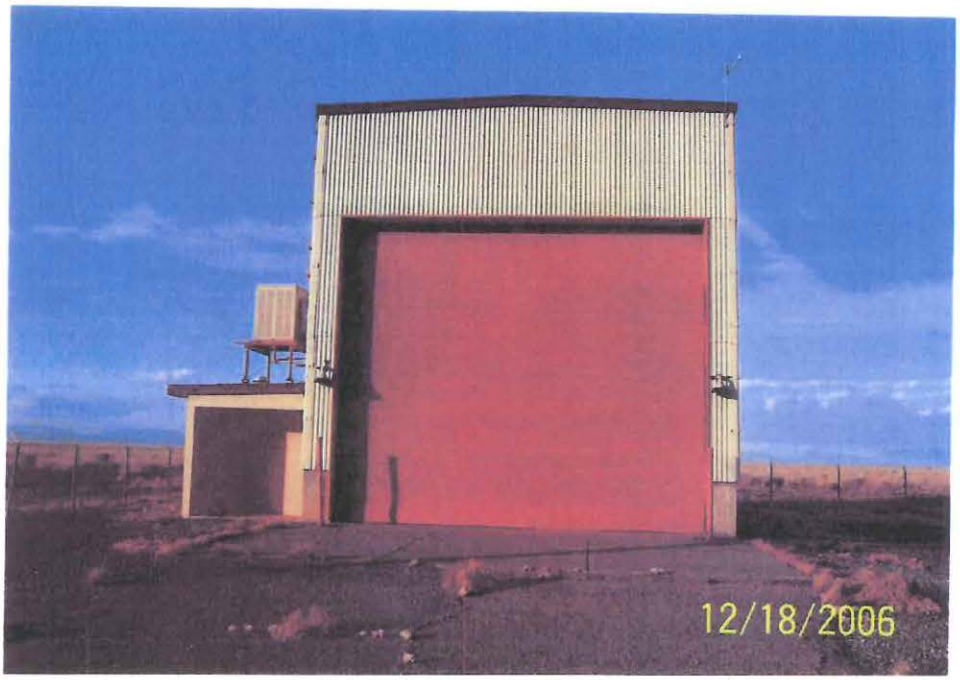


Figure 4: Pictures of Bldg. 921

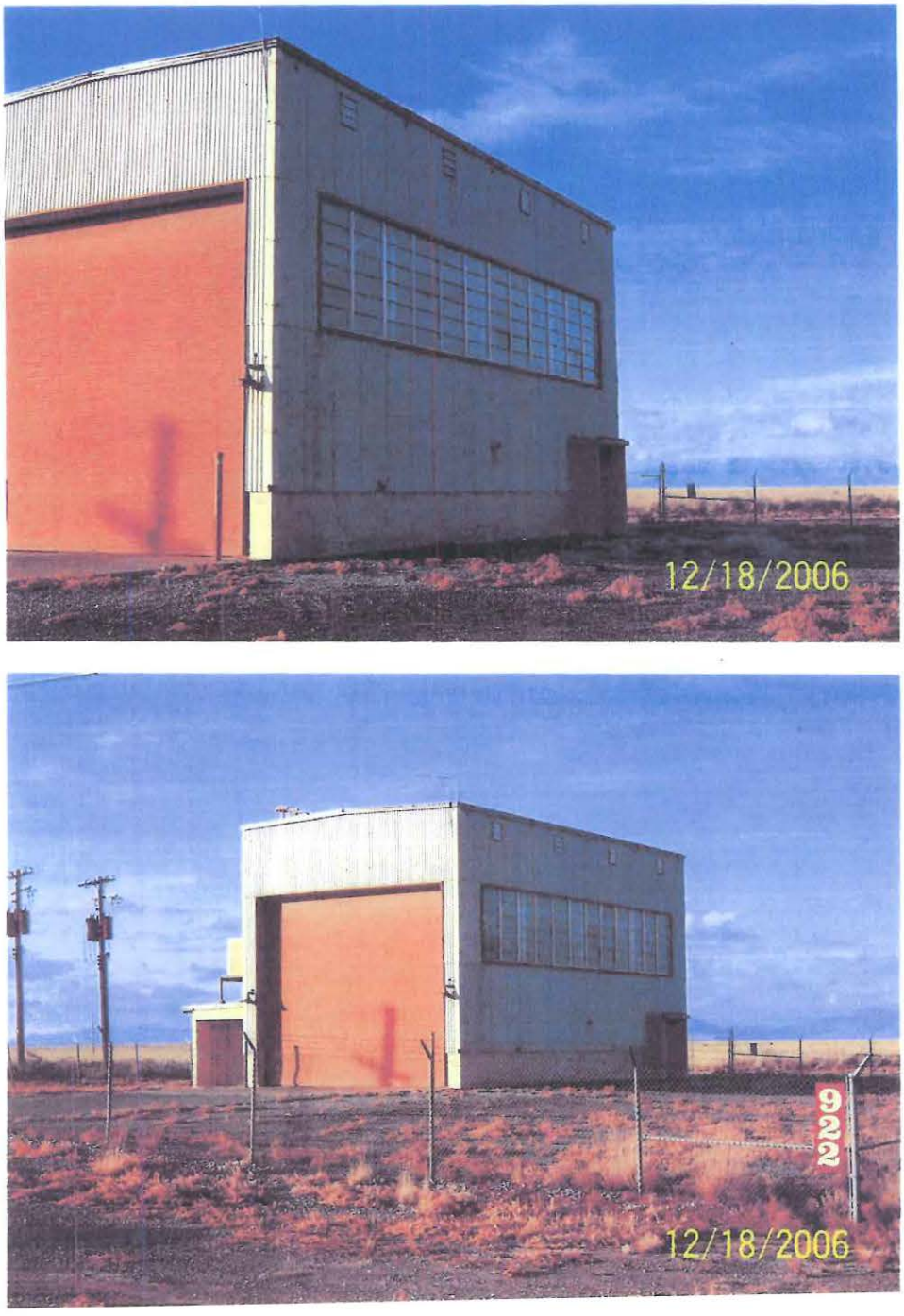


Figure 5: Pictures of Bldg. 922

INACTIVE SEPTIC SYSTEMS

BUILDING 924

This building was constructed in 1959 and has 4800 SF.
The building's original service was ammunition assembly similar to buildings 920-922.
It was later used for maintenance of radar tracking equipment.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

An on site inspection was done for this building on 20 Dec 2007 with the current facility manager, Mr. Michael Tackett. He did not have any information about the history of the septic tank system. Currently the building is being used for munitions storage. For the past two year it has stored rocket motors for the test track. From the on site inspection and drawings (Attachment 4-6) it can be seen that the bathroom drain is separate and there are no floor drains.

There are no pictures on file of this building.

INACTIVE SEPTIC SYSTEMS

BUILDING 1091

Site Description: There are no current files on this building because the building has been demolished. The building served as the Airfield Control Tower until replaced by the present Control Tower
On Attachment 55b a drawing of where the leach field was located in 1984 can be seen.
Grid Coordinates: J.9, 10.2
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: No secondary containment associated with underground storage tank
Probable Spill Route: Leakage from underground tank will contaminate water table in local vicinity

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 / UST

There were also three drawings that were discovered during the research stage of the project. The drawing (Attachment 7) shows the Septic Tank Details, Septic Tank Drain Field and the Drain Field Details.

INACTIVE SEPTIC SYSTEMS

BUILDING 1097

Specifications and history of this building are given in the following "Cold War Survey: Holloman Air Force Base". Along with this survey an on site inspection was done on 28 November 2007 with the current facility managers, A1C Clinton Bennett and TSgt Robert Edyburn. During the on site inspection it was discovered that the bathroom is separated from work area drains. In the past the building was used as a communications work center (office space) until 2005. There are no floor drains in the work area. It is currently being used as a houses base for a radio system network. There were also three drawings (Attachment 8-10) that were discovered in the investigation phase of the project. The drawings show the Materials Septic System, the Septic Tank Placement and Piping, the Latrine Plan, and the Mechanical Plumbing Plan.

Facilities in this building consist of:

- Toilet
- Urinal
- Lavatory

Description: Communications facility
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: None
Probable Spill Route: Leaks dissipate in local area on ground

Tank Location: South of facility
Fuel Flow – South/West

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 /AST
	500 gal each/ 1 /UST (Abandoned)

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Communications, Receiver.
Historic: Transmitter/Receiver.
Street Address: 1432 Sabre Road, HAFB, 88330-7842.

Building Number: 1097

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [ ] Minor [ ] Moderate [x] Major

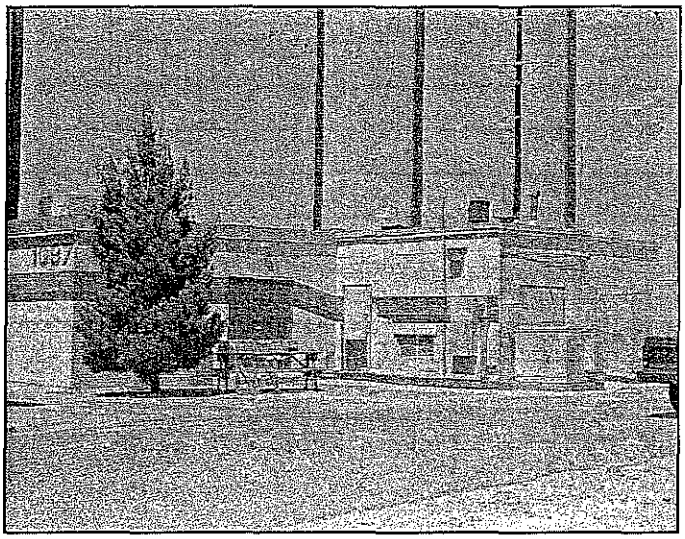
Comments:

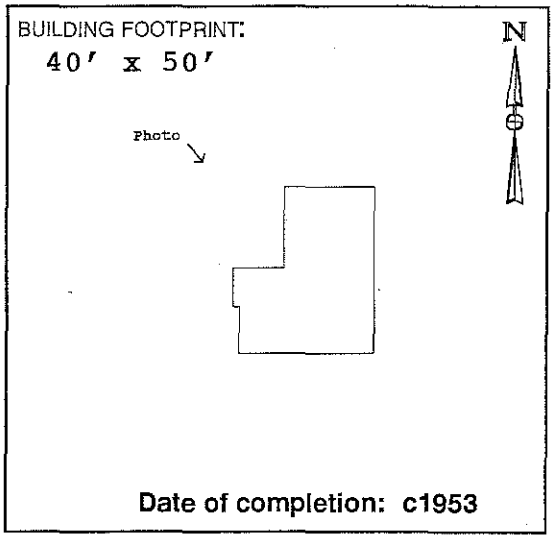
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1097 has not retained historic integrity.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1953

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1097 is a small transmitter building designed with few embellishments for utilitarian use only. Building 1097 originally had a rectangular footprint identical to Building 1098 and Building 1095. The original floor plan was sectioned into 4 rooms. An addition was constructed at the west elevation in 1986 using compatible structural and architectural components (CE File #1097-1). Both the builder and the architect are unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1097.

Current Function: Receiver/Air Traffic Control/Radio Control.

Original Function: Transmitter/Receiving/Communications.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1098-1 (c1952).

Foundation: Concrete wall footing. Concrete slab on granular fill.

Exterior walls: Painted concrete masonary units (CMU).

Roof: BUR on 2" rigid insul.; 2" poured gypsum on gyp board sup. by steel joists.

Notable interior features, including machinery:
Construction drawings document *"UHF Radio Air/Ground Facilities AN/GRC-27"*.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:
Continues to function as a communications facility/receiver site.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1097 has served as a Base communications facility since its completion c1953. Several renovations have resulted in a loss of historic integrity for this building. Building 1097 is no longer eligible for the National Register of Historic Places.

VII. ASSOCIATED BUILDINGS:

Location plan CE File #1098-2 identifies at least three north area transmitter sites. Building 1097 was associated with transmitter Building 1098. This facility is also associated with the flightline, and with communications Building 221.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building #1097 retains its original function as a radio receiver facility, however it has been modified to accommodate electrical, mechanical, and equipment additions and change-outs. Original equipment has been replaced.

Office space was added to the south elevation (1986: CE File #1097-1). All six windows at the north, east and west elevations have been blocked in. Original doors have been replaced. Vinyl floor tile covers original tile throughout. Dropped ceilings have been added.

This building, although retaining historic significance as a receiving site, has lost integrity of design, materials, workmanship, and association with its period of significance. Note: A Sgt. Boots (extension 3132) was identified by Building 1097 personnel as being a possible source for oral history research concerning specific activities associated with this facility.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Office space added to the west elevation (c1986: CE File #1097-1).

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Construction of adjacent buildings has altered viewshed.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Windows have been blocked in.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: An addition obscures the original west elevation. The original window treatments removed. Dropped ceilings added. Original asphalt floor tile covered.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: The presence of interior communications equipment and exterior poles contribute to the integrity of feeling as a radio site.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

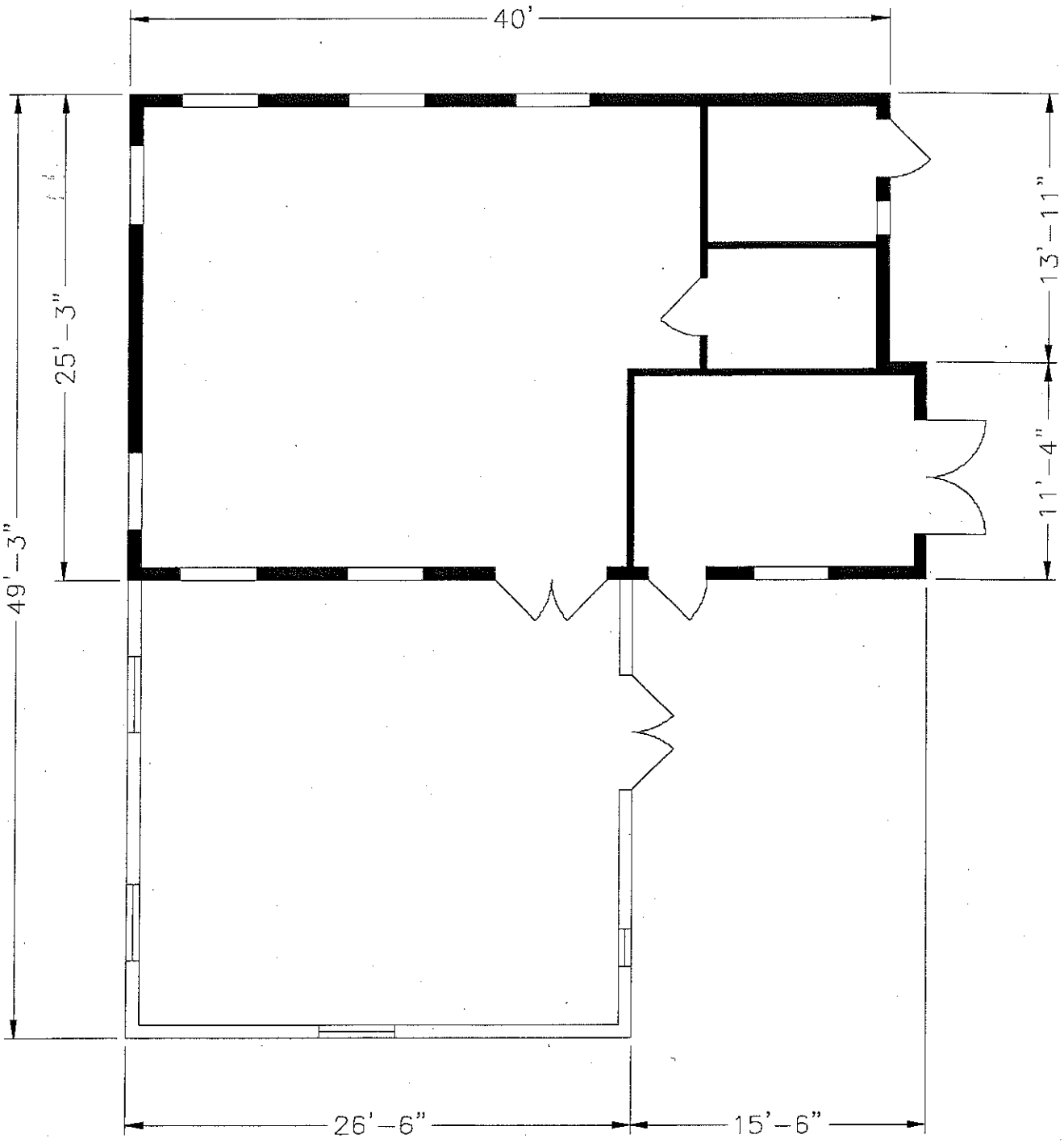
Comments: Original equipment has all been replaced.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #81**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



140

Source: CE File #1098-2 (c1971)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1097** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1190

This building was constructed in 1952 and demolished in 2002. Specifications and history are provided in the "Cold War Survey".

The only drawing discovered was the plumbing floor plan and it can be seen in Attachment 11. Attachment 55d shows the current location of the leach field in 1984.

2002 Demolished Due To Deteriorated Condition

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Security Police Building.
Historic: Change House/Unconventional Fuel Storage.
Street Address: 1514 Lethal Road, HAFB, 88330-7840.

Building Number: 1190

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1190 is in need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

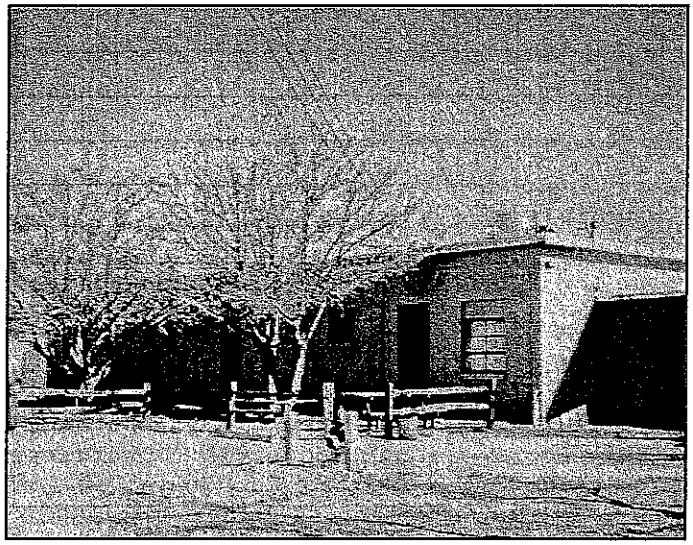
Comments: Interior partitions have been removed (date unknown).

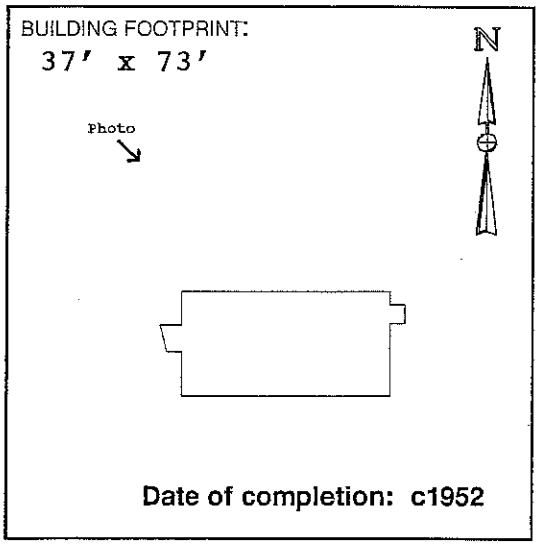
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1190 is a single-story, flat-roofed, concrete masonry unit (CMU) building exhibiting large roll-up equipment doors, numerous personnel access doors, and asymmetrical window fenestration. Construction drawings prepared in 1951 were stamped "As-built" but were not stamped in the revision block. Real Property Accountable Record/1190 indicates that Building 1190 was completed c1952 as a Change House for unconventional fuels personnel. W. C. Kruger Company (Santa Fe, NM) provided the construction drawings stored in CE File #1190. The builder is not known. A comparison of the current building and original blueprints reveals that no structural modifications to the building have occurred.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1190; CE File 1195-1 (c1951).

Current Function: Security Police operations.

Original Function: Change House, Unconventional Fuels.

Interim Functions: "RC Con House" (n.d.); "Prpln R-L Fuel/Lub" (n.d.); Prop Res Lab Rocket" (n.d.); "Prpln R-L Rkt" (n.d.); Sp Operations (n.d.).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1190-1 (c1951).

Foundation: Poured concrete footings and grade beams; concrete slab.

Exterior walls: Concrete masonry units (CMU).

Roof: (Built-up) gravel on rigid insul.; 2" slab sup. by metal lath and steel joists.

Notable interior features, including machinery: Shower stalls, locker room, dressing room, and laboratories.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

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VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Recommend reassessment of Building 1190 once the fifty-year construction date is met in the year 2002. This building retains historic integrity.

VII. ASSOCIATED BUILDINGS:

According to CE File #1190-1 *Title Sheet*, Unconventional Fuels Storage Building 1190 was associated with Building 1194 (Booster Inspection), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

This building retains all aspects of historic integrity. Although not meeting the "exceptional importance" standard imposed on buildings constructed within the last fifty years, Building 1190 remains potentially eligible as an individual property once the fifty-year date of construction is met in the year 2002. Recommend inclusion in a Multiple Property nomination along with the other unconventional fuels storage buildings. Building 1190 is currently being used as a storage and administrative facility by the 49th Squadron Security Police personnel. The original shower stalls, dressing room, locker room, shop, tools and supply rooms are all used for storage. Free-standing shelves have been installed to accommodate storage. As a result, some original doors and windows are blocked from view. Minor alterations have occurred at the interior. Two partitions have been removed. Glazed tile walls appear to have been added to at least one office. Vinyl tile has been installed over one section of the concrete slab in what once served as a machine shop. Some of the window panes have been painted. Because this facility remains potentially eligible, recommend that the original design features be considered in future modifications, and that photographs document any changes to the essential features. Suggested routine maintenance: Prune trees away from principal facade. Noticeable water damage warrants inspection of the roof. Replace broken window panes. Repair hole at exterior south elevation wall.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: Interior room layout as a Change House remains a key design element. This layout includes large open interior spaces, smaller labs/offices, and showers, dressing, and locker rooms used by unconventional fuels personnel.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Although no longer used as such, Building 1190 continues to be situated in the vicinity of other buildings historically associated with unconventional fuels testing and storage. This building appears to been recently landscaped.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two interior partitions removed. Glazed tile walls in office rather than CMU shown on original drawings.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Nearly all original workmanship remains visible, particularly at exterior.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Aside from the change in operations occurring here, Building 1190 remains essentially as it was originally constructed.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

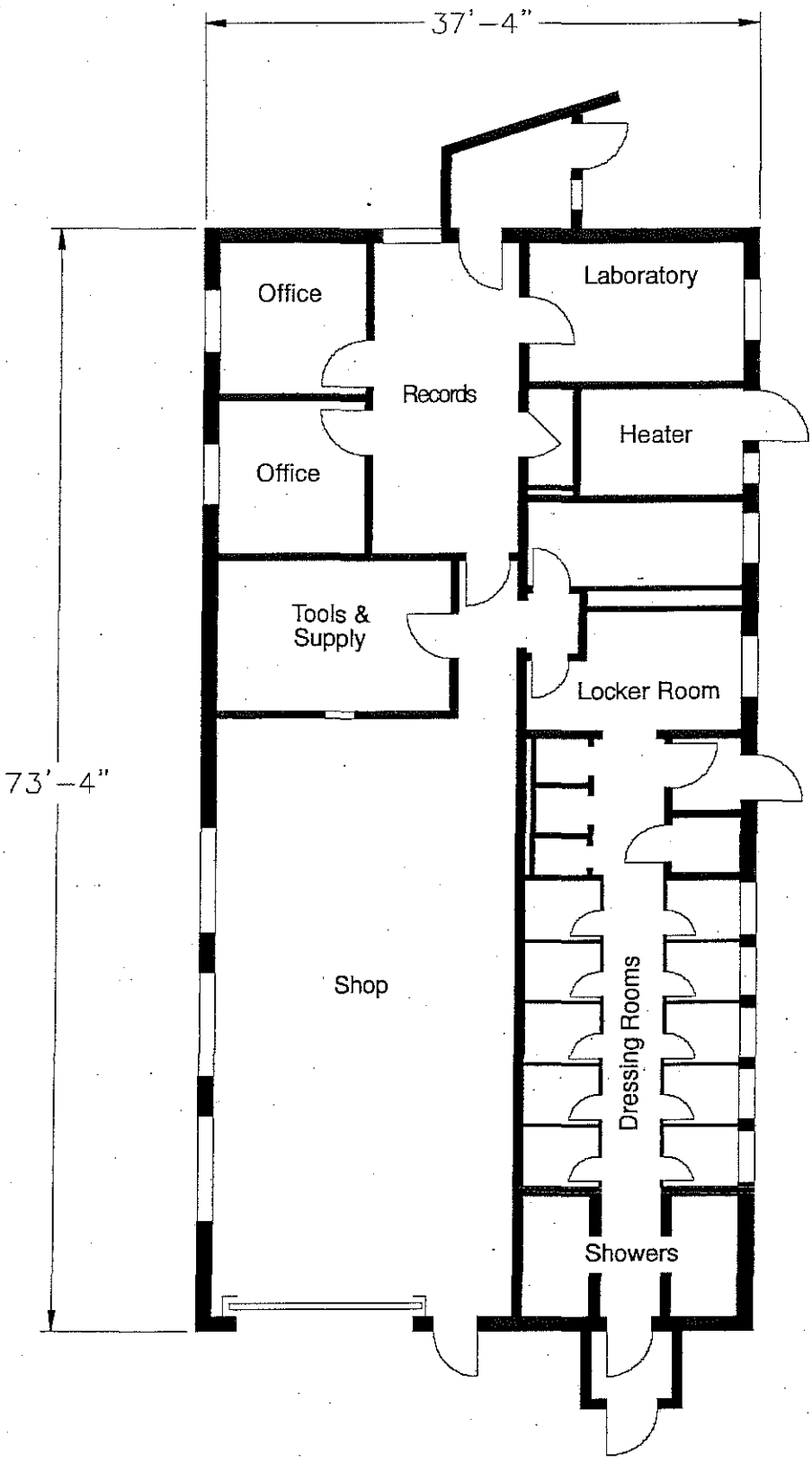
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #-Photo #**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1190-1 (c1951)

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State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1190** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Mike Gardner* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1194

Specifications and history are given in the "Cold War Survey".
Facilities in this building consist of:

- Toilet
- Lavatory

An on site inspection was done on 7 Jan 08 with the current facility manager, SSgt Joshua Roberts. In the inspection it was noted that the bathroom is separated from the work area drain. There was no history known. The building is currently being used for storage and it has been used for storage and has been used for storage for the past ten years.
Attachment 55d shows where the leach field for Bldg.1194 was located in 1984.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME: **Building Number:**

Current: Research Equipment Storage.

Historic: Booster Inspection/Unconventional Fuel.

Street Address: 1584 Lethal Rd., HAFB, 88330-7840. **1194**

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1194 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

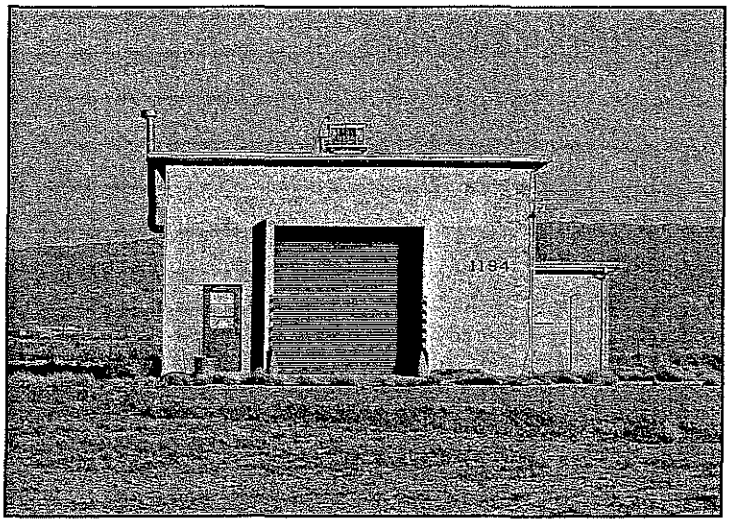
Comments: Interior partitioning is reversible.

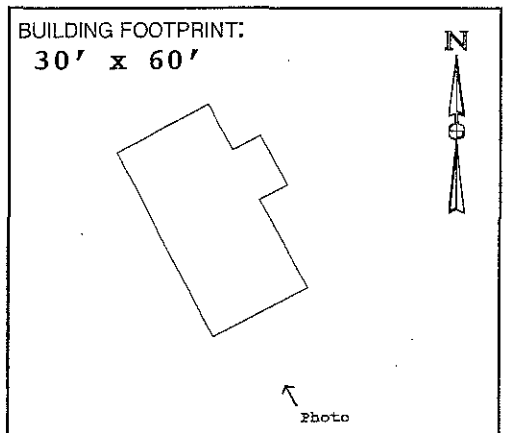
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1194 is a rectangular, single-story, high bay structure made of concrete masonry units (CMU) and exhibiting a flat roof. The principal elevation faces west, showing one large roll-up door, and one personnel door. One row of windows is located below the eave line at the north and south elevations. The ceiling at the interior is exposed. "As-built" construction drawings show that Building 1194 was completed in 1952. W. C. Kruger Co. (Santa Fe, NM) provided the architectural work (1952: CE File 1194). The builder is unknown. No structural modifications to the original structure were noted.

III. HISTORIC AND CURRENT USE:

Current Function: Research equipment storage.

Original Function: Missile Assembly Test Building/Booster Inspection.

Interim Functions: "Mls/Space Rsch Tst" (n.d.); "M/Assembly Test Bldg" (n.d.); "Shp Wpn and Rlse Sys" (c1976); "BE Stor Cv Fclty" (n.d.); "Rsch Equip Stor" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1195-1 (c1952).

Foundation: Poured concrete footings and stem wall. Slab on compacted fill.

Exterior walls: CMU between concrete columns and bond beams.

Roof: BUR gravel. Rigid insulation. 2" concrete deck supported by steel joists.

Notable interior features, including machinery:

4-ton Wright Company chain-operated crane and hoist system, hoist no. 5197, serial no. 4925. The hoist is attached to a runway "I"-beam (crane) supported by steel support beams. Large metal roll-up doors at east and west elevations.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1194, although not meeting the "exceptional importance" standard, may be eligible for the National Register for its role in early Cold War materiel development once the fifty-year construction date is met in 2002.

VII. ASSOCIATED BUILDINGS:

According to CE File #1195-1 (c1951) *Title Sheet*, Building 1194 was associated with Building 1190 (Change House), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1194 remains essentially as it was constructed c1952. The original floor plan layout included one main room and an equipment room. A small area in the northwest corner of the main room has been partitioned. No documentation was found pertaining to this modification. This minor partitioning of the main room is reversible. This building is no longer associated with either missile assembly and test activities or unconventional fuels storage, and currently serves as an equipment storage room for the 6585th Test Group. Construction drawings (1956: CE File # 1194-1) show that an addition to this building was planned. There is no indication that this addition was ever built. Because this building retains historic integrity, and may be eligible for the National Register under Criteria A and/or C once the 50-year construction date is reached in the year 2002, recommend that future modifications take essential design features into account. Note: One isolated occurrence of prehistoric artifacts was noted on the grounds north of the building, including one white chert core, and one secondary chert flake.

Suggested routine maintenance: Scrape, prime, and paint the exterior. Replace downspouts. Prune landscape plantings away from foundation.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Construction drawings show plans for an addition to the north elevation (1956: CE File #1194-1). There is no evidence that this addition was ever built.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The high open-bay floor plan allowing the crane and hoist system, and the large metal equipment roll-up doors remain as key design elements.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Buildings 1193 and 1194 remain in an unmodified and isolated setting.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Nearly all of the historic materials used to construct this building remain visible.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two doors have been replaced. All windows appear to be original. Interior partitions at the northwest corner divide the original floor plan.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Although retaining its original open floor plan, this building is currently used for storage of modern equipment.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

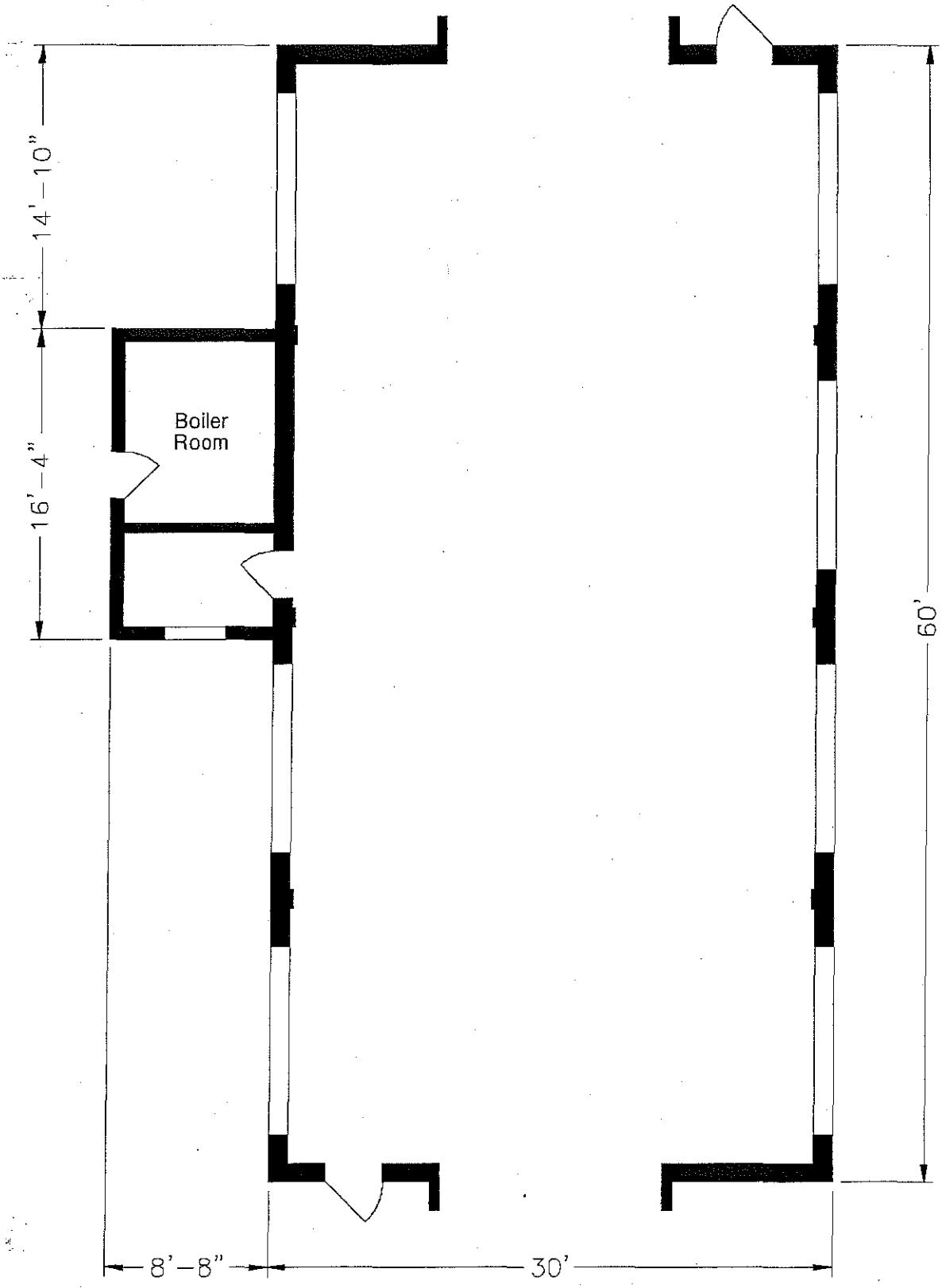
Comments: The open floor plan, isolated setting, hoist system, and nearby continuity check stand (Building 1193) contribute to this building's integrity of association.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #3-Photo #31**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1195-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1194** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1196

This building was constructed in 1956. It originally built for missile assembly, but is now in communications equipment storage.
The original facilities consisted of:

- Toilet
- Lavatory

These facilities were replaced in 1975 with:

- Toilet
- Urinal
- Lavatory

An on site inspection for this building was done on 4 Dec 07 with the current facility manager Sgt Lander. The information gathered from this inspection was that there were not any floor drains located within the building. In the past it was used for TAC can and for the past ten years it has been used for storage.
Attachment 55d shows where the leach field for Bldg. 1196 was located in 1984.

Figure 6: Picture of Bldg. 1196

INACTIVE SEPTIC SYSTEMS

BUILDING 1199

This building was constructed in 1957. It was originally built as a rocket fuel laboratory. In 1987 it was converted to the Security Forces Kennel.
As the fuels laboratory, it contained:

- Toilet
- Urinal
- Lavatory
- Shower

After conversion to the kennel, the facilities were changed to:

- Toilet
- Urinal
- Stainless Steel Sink

During the investigation stage of the project there were drawings found for building 1199. Attachment 12 and 13 are of the Site Plan, the Sewer Isometric, the Plumbing Plan and the Floor Plan.

Along with the drawings that were found an on site inspection was completed on 29 Nov 07 with the current facility manager, SSgt Gilmore. A new Security Forces Kennel area has been built and now the building is currently being used to house animals until they can be transferred to Alamogordo Animal Control.

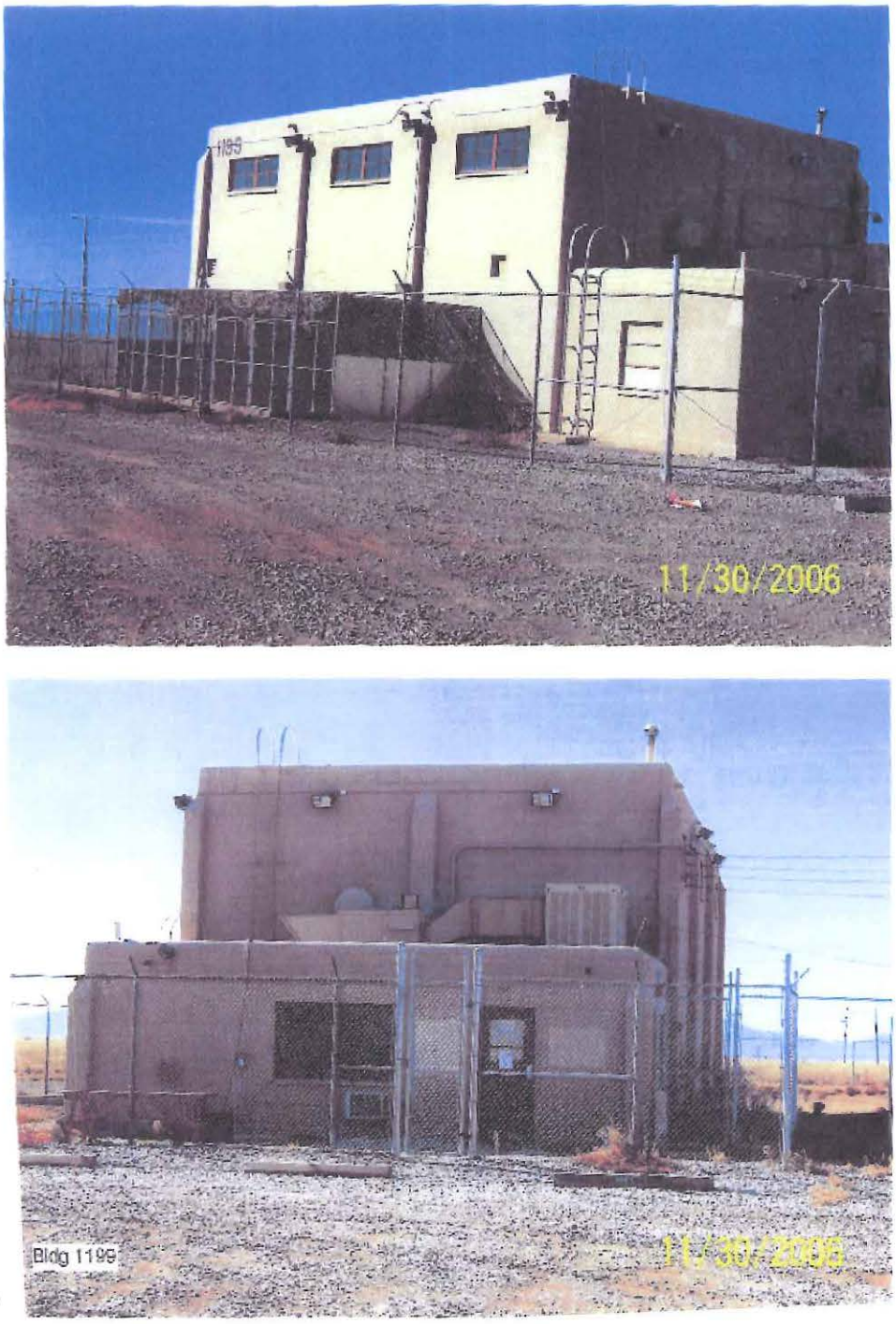


Figure 7: Pictures of Bldg 1199

INACTIVE SEPTIC SYSTEMS

BUILDING 1200

Specifications and History: See "Cold War Survey".

Three drawings were found for this building. These drawings show the Plumbing Floor Plan (Attachment 14), a Floor Plan (Attachment 15) and the Septic Tank and Drain Field (Attachment 16).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab, Medical (VACANT).
Historic: Space Biology Laboratory.
Street Address: 841 Douglas Road, HAFB, 88330-7823.

Building Number: 1200

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [ ] Needs maintenance [x] Deteriorated [ ] Archaeological

Comments: Building 1200 is abandoned, and showing signs of deterioration.

Degree of Alteration: [ ] None [ ] Minor [x] Moderate [ ] Major

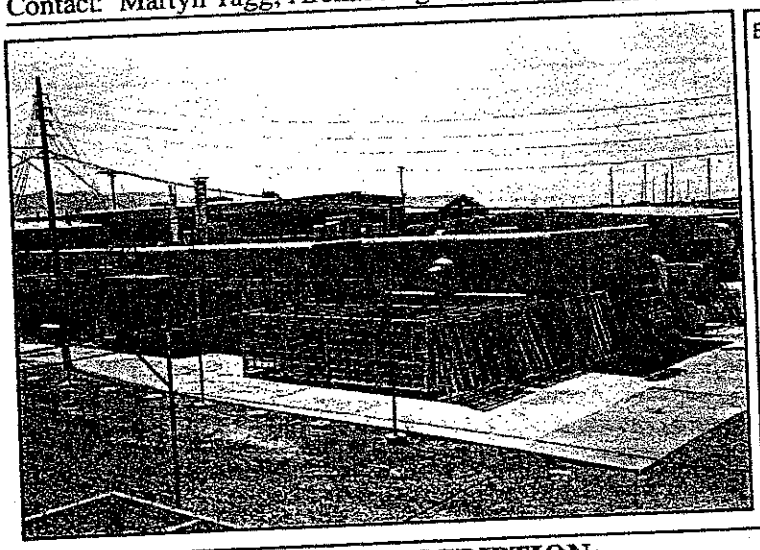
Comments: Alterations are architectural rather than structural.

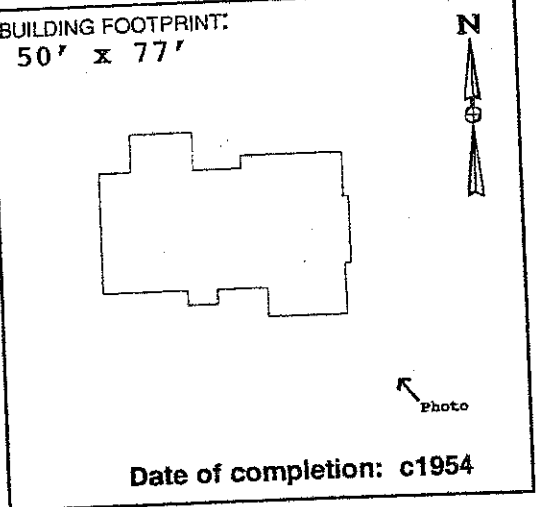
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1200 no longer retains historic integrity. See Section VI.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1954

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II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1200 is a rectangular, single-story, flat-roofed concrete masonry unit (CMU) building constructed as one of several laboratories dedicated to important aeromedical research using both animals and humans. None of the construction drawings were correctly stamped "As-built." According to Real Property Accountable Record/1200, the estimated date of construction is 1954. Subsequent improvements documented in CE File drawer #1200 include an addition to the medical lab (c1958), a covered passageway added to the boiler room (c1957), and a frame wall addition to the surgery room (c1957). Neither the builder nor the architect is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1200; Field visit Summer 1995.

Current Function: Vacant.

Original Function: Space Biology laboratory/Animal experimentation.

Interim Functions: Animal experimentation/Storage.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1200-1 (c1953).

Foundation: Concrete wall footings. Concrete slab on fill.

Exterior walls: Painted concrete masonry units (CMU).

Roof: BUR on concrete deck, supported by metal lathe and steel bar joists.

Notable interior features, including machinery:

Originally used as a medical laboratory, with work tables, work benches, built-in lockers, cabinets, operating tables, x-ray tables, etc.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:

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One room is currently being used for storage. All medical and laboratory equipment has been removed.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Due to extensive alterations to the exterior, Building 1200 no longer retains historic integrity. Recommend, however, that this building be considered as a contributing feature in a basewide early Cold War National Register of Historic Places Multiple Property nomination.

VII. ASSOCIATED BUILDINGS:

Building 1200 was an integral part of Holloman's aeromedical facilities, including Buildings 1201, 1202, 1203, 1204, 1205, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Since its original construction c1954, Building 1200 has been used as a laboratory and medical facility for a wide variety of research animals, including trout, black bear, dogs, mice, and chimpanzees. Although currently abandoned, this building featured a lead-lined x-ray room, an autopsy room, an observation room, a surgery room, a dark room, and animal pens (c1954: CE File #1200-1). Built-in steel lockers, metal cages, x-ray tables, work benches, food bins, operating tables, scrub sinks, surgical lamps, sterilizers, etc. have been removed. Two exterior doors have been blocked in, and thirteen exterior windows have been blocked in. One exterior door and one exterior window have been added. Interior walls have been added, removed, or relocated. A storage room has been added to the south elevation. Animal cages remain at the west elevation. The presence of dead rodents, foul odors, torn pipe and duct insulation (possible containing asbestos) and peeling paint (possible lead-based) represent hazards to health and safety. Because of the unique and important nature of the research conducted here, recommend that this building be nominated as a contributing feature as part of an HAFB early Cold War National Register Multiple Property nomination.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?
[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.
Comments: The building has been located at its present location since c1954.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?
[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact
Comments: Most of the original doors and windows have been removed. All of the equipment has been removed. Most of the original finishes have been obscured.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting
To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting
Comments: Continues to be situated in an isolated setting with the other Aeromedical facilities.

Materials: To what extent have the original materials used to construct this structure been retained?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Elevations have changed due to modified openings, an addition, and a covered passageway. Interior wainscot and cornice removed, wall tile added.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Exterior walls and cages remain intact. Some architectural features remain. Most of the original interior workmanship has been lost.

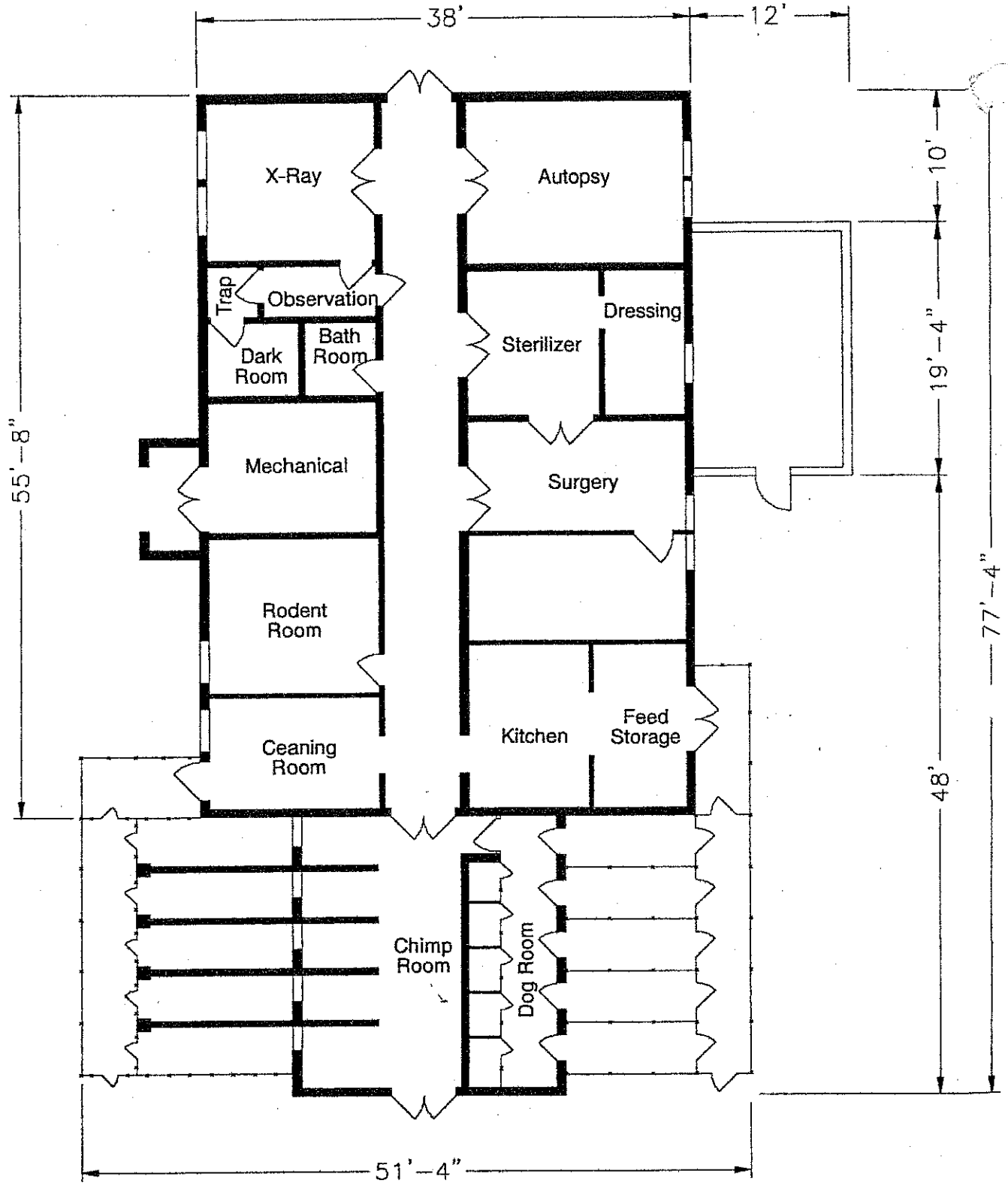
Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?
[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity
Comments: Building 1200 continues to be situated within the compound set aside for animal research. Chimpanzee research continues today in nearby buildings.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?
[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity
Comments: Although all of the equipment has been removed, this building still demonstrates a link with its past by virtue of its setting, the odors, and the animal cages.

X. FURTHER INFORMATION:

Surveyed By:
Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #94**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1200-1 (c1954)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1200** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

BUILDING 1201

Specifications and History: See "Cold War Survey"

Seven drawings were found for this building. These drawings show the Septic Tank and Absorbent Area Layout, Isometric Sewer Layout, Septic Tank Plan and Septic Tank Elevation (Attachment 17), Floor Plan (Attachment 18), Layout Plan (Attachment 19) and Systematic-Waste System (Attachment 20).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab Medical.
Historic: Aero. Medical Field Lab.
Street Address: 821 Douglas Road, HAFB, 88330-7823.

Building Number: 1201

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Structurally intact. In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

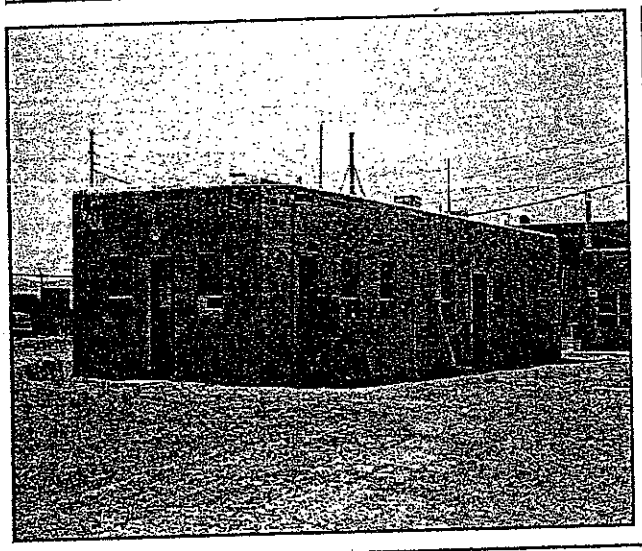
Comments: Mortuary/autopsy room added as subsequent improvement c1958.

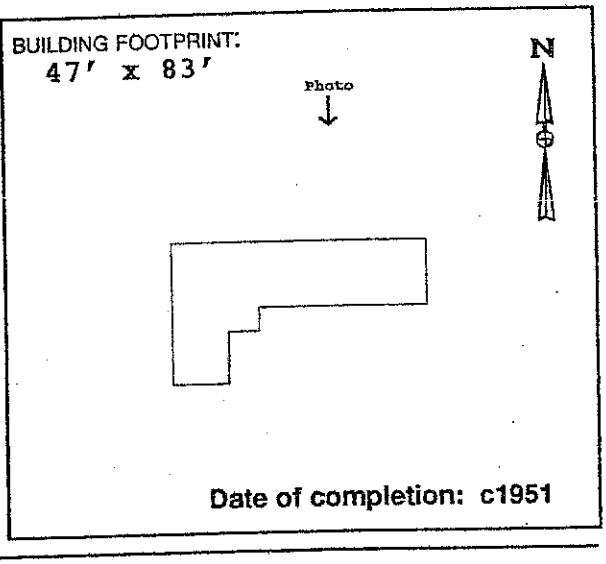
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible under Criteria A and/or C at a national level.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1951

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1201 is an "L-shaped", single-story, flat-roofed, building constructed primarily using painted 8" structural clay tile and exhibiting asymmetrical door and window placement. Animal cages occupy the west elevation. Real Property Accountable Record/1201 indicates that this science laboratory was constructed c1951. The construction drawings consulted were stamped "As-Built," although no date was given. Both the architect and builder are unknown.

At least two structural modifications may be viewed as subsequent improvements to the original building, including the addition of a Mortuary/ Autopsy Room (c1958: CE File #1201-4), and the addition of a rooftop observation deck (c1952: CE File #1201-5).

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1201.

Current Function: Carpentry shop; Employee break room; Office space.

Original Function: Aerospace Medical Lab; Animal experimentation.

Interim Functions: "SC Lab Human Eng" (n.d.); "SC Lab Med (c1968).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1201-1 (c1951).

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted structural clay tile.

Roof: Built-up roof w/ gravel on sheeting, supported by 2x12 wood joists.

Notable interior features, including machinery:

Fixed chain link cages, lab tables, equipment tables, work tables, wood storage bins, sterilizer, incubator.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL: (Based on field visit Summer 1995

[c1958 SUBSEQUENT IMPROVEMENT--MORTUARY/AUTOPSY]:

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted cement masonry unit (CMU).

Roof: 5-Ply built up roof on concrete slab. Steel joists.

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Notable interior features, including machinery:

Washer and dryer, kitchenette, tool room, table saw, furniture, lockers.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1201 is eligible to the National Register under Criteria A and/or C at a national level of significance for its vital role in early aeromedical research in support of the early Cold War space exploration mission.

VII. ASSOCIATED BUILDINGS:

Building 1201 was associated with the other Aeromedical facilities, including Buildings 1200, 1202, 1203, 1204, 1205, 1206, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1201 retains historic integrity as far as the structure itself goes. Very little physical evidence remains of this structure's original use as an animal laboratory. The cages have been removed. Two interior walls with doors have been added. One interior wall has been removed. Service sinks, work tables, wooden bins, an incubator, and other lab support items shown on c1951 construction drawings have been removed. An area of the original roof approx. 10' x 13' was reinforced with three inches of concrete for observation deck c1952 (CE File #1201-5). A mortuary/autopsy room was added c1958. These additions may be viewed as early improvements, and do not diminish Building 1201's historic integrity. Drawings itemize a "2-body" mortuary room, an autopsy table, a band saw, cabinets, a sterilizer, a photography area, and other laboratory equipment. This equipment has been removed. This room currently serves as a lounge area for employees. Due to the important research conducted here in support of this nation's space program, further research is warranted. Recommend that Building 1201 be included in a Cold War-era Multiple Property nomination. Suggested routine maintenance: This building is showing the signs of long-term neglect. Fill the stress cracks at the exterior corners. Scrape and paint exterior walls. Replace window glass and door hardware as needed.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Continues to be situated in an isolated compound.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Original structure essentially intact. Interior lab equipment and cages removed.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Enclosed by chain link fence topped with barbed wire, along with other research facilities. Chimpanzee research continues in nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Clay tile walls still intact. Some glass block windows remain. Some glass block windows blocked in when addition constructed. Floor tiles removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Roof, walls, and exterior openings remain essentially the same. The east elevation changed due to an early addition. Interior partitions, openings, and finishes have changed.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Historic photographs show that the natural, historic, and aesthetic character of Building 1201 has been retained.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

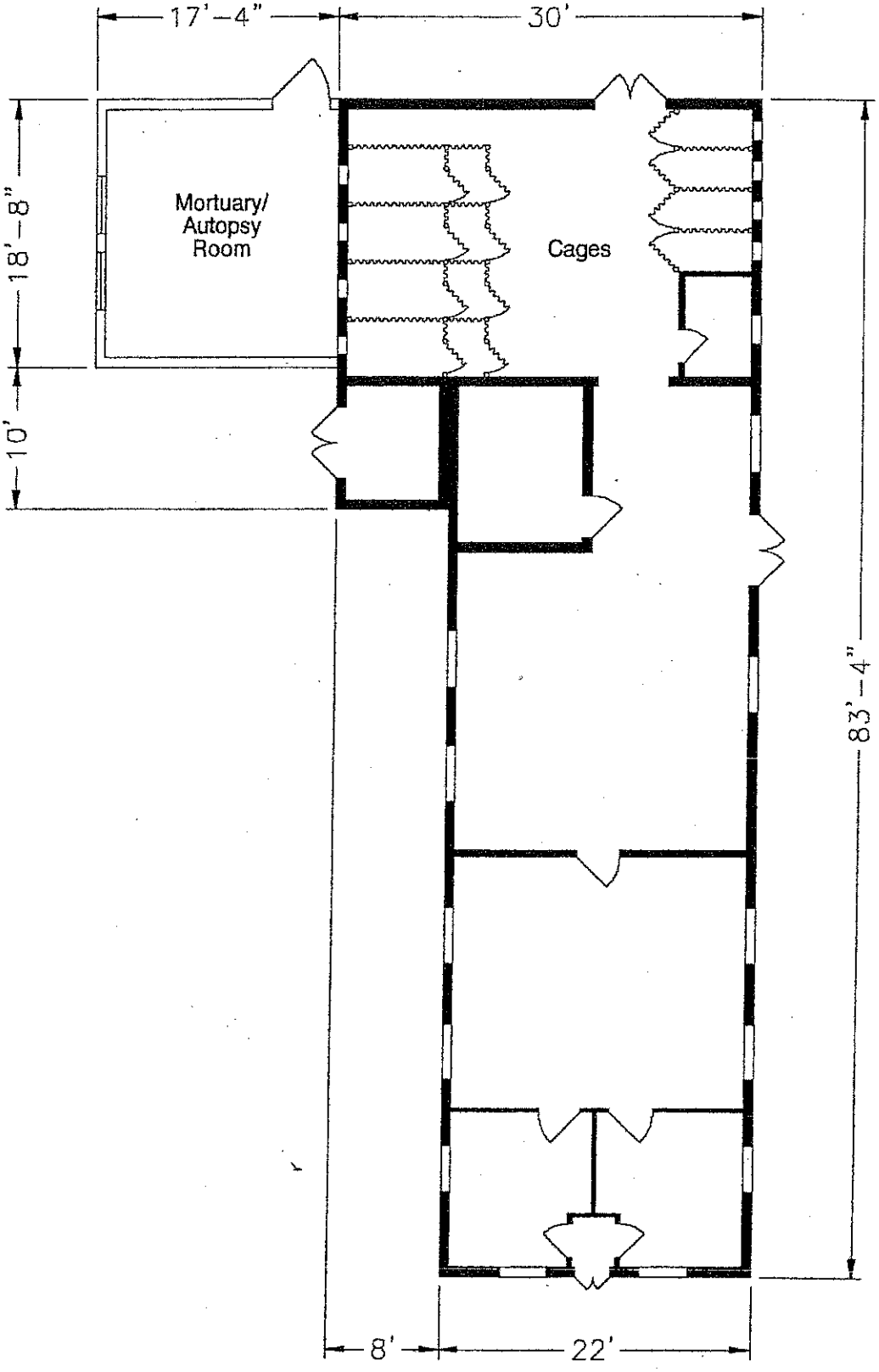
Comments: Building 1201 retains a visible link with its period of significance.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #91**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1995**



280

Source: CE File #1201-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1201** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

Buildings 1219, 1221, 1235 and 1239
An on site inspection was completed on 20 Dec 07 with the current facilities manager, TSgt Pote, he has been the facilities manager for the past nine years. During the inspection it was discovered that there are sink holes on all leach fields in the compound. All buildings in this compound have separate drains for the bathrooms. All buildings are also currently connect to the base sewer system.
Attachment 55d shows the leach field location for Buildings 1219, 1221, 1235 and 1239.

BUILDING 1219

This building is the Administrative Offices for the Munitions Maintenance Squadron. It was constructed in 1985 and covers 4476 SF.
There are Men's and Women's Bathrooms that discharged into two (2) septic tanks prior to the installation of a sewer main that discharges to the Base Waste Water Treatment Plant.

INACTIVE SEPTIC SYSTEMS

Building 1221

This building is in the Ammo Depot and was originally constructed for ammunition storage. It was later switched to store inert munitions.
The building was constructed in 1983 and covers 2857 SF.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan (Attachment 21), Floor Plan (Attachment 22), Partial Plan (Attachment 23), Septic Tank Details and Sewage Disposal System (Attachment 24) and a Profile of Sewer Line Septic Tank and Disposal Field (Attachment 25).

INACTIVE SEPTIC SYSTEMS

BUILDING 1226

This is a munitions maintenance shop building constructed in 1985. It has 2945 SF of floor space.
Facilities installed include:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Utilities Plan (Attachment 26), Plumbing Demolition Plan (Attachment 27), Plumbing and HVAC Plan (Attachment 28) and Waster/Water Piping Detail (Attachment 29).

In Figure 8 on the following page it can clearly be seen where the leach field is in relation to where building 1226. This is the leach field for building 1219, 1221, 1235 and 1239 as well. In Attachment 46 (a map showing many of the building on Holloman AFB) it can be seen where building 1226 is in relation to these building.

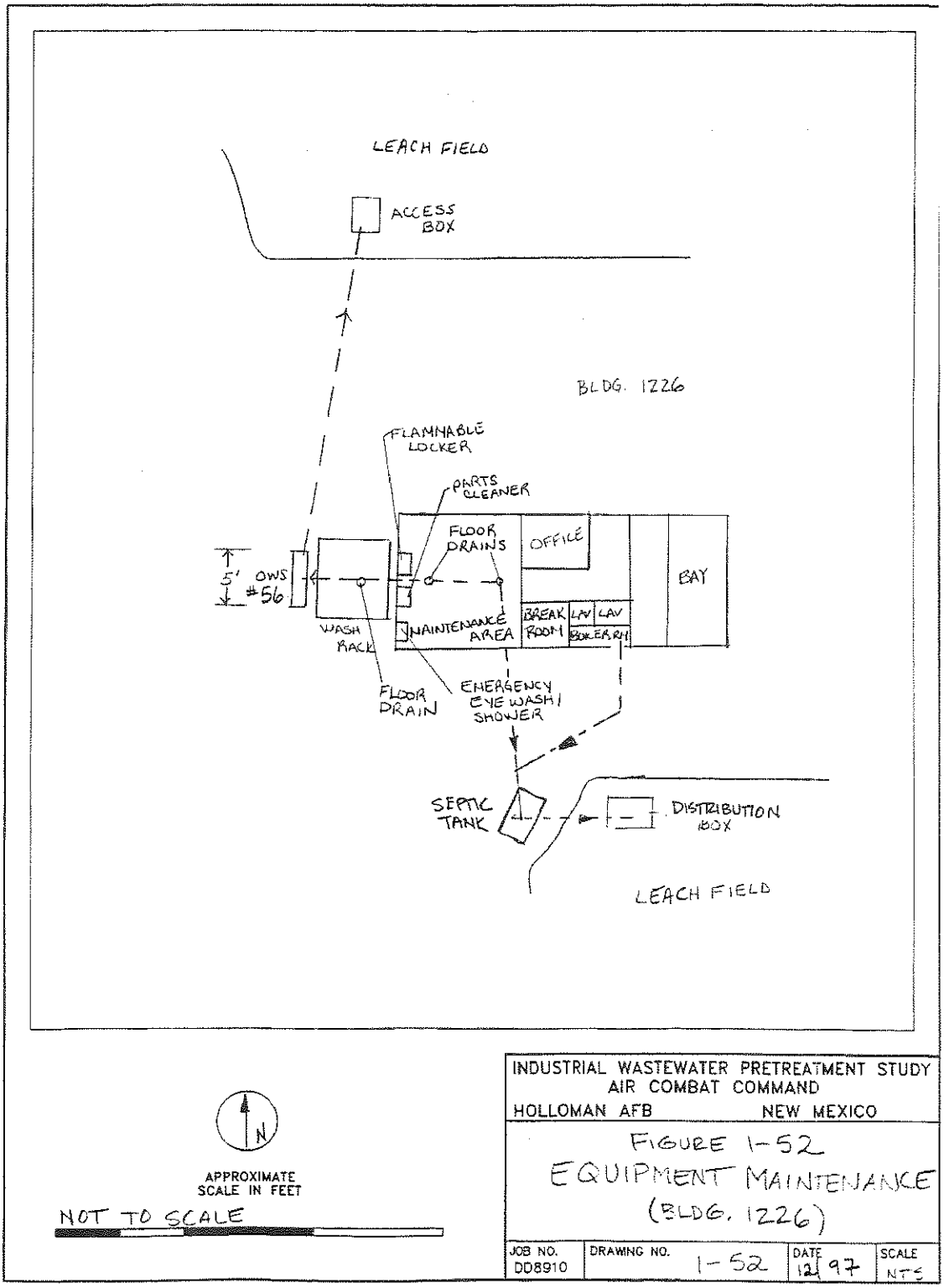


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Figure 8: Drawing of Leach field

INACTIVE SEPTIC SYSTEMS

BUILDING 1235

This building was constructed in 1964 and contains 3000 SF of floor space.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, a drawing for this building was also located. This drawing (Attachment 30) shows the Site Plan, Septic Tank Details and Sewer Clean Out.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST

INACTIVE SEPTIC SYSTEMS

BUILDING 1239

This is another building in the Ammo Depot. It was constructed in 1971 and contains 1920 SF.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Urinal
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan, Septic Tank Details, Utility Plan (Attachment 31), Floor Plan (Attachment 32), Grading Plan (Attachment 33) and Lavatory Detail (Attachment 34).

INACTIVE SEPTIC SYSTEMS

BUILDING 1250

This building was constructed in 1957 and contains 2890 SF.
It was originally a water pumping station. In 1985 it was changed into a storage facility. As part of the change in service the bathroom facilities were removed. Currently it has a large infestation of vectors and it is unsafe to go inside. The POC for this building is Mr. Chuck Price.
The original facilities consisted of:

- Toilet
- Lavatory
- Floor drains for the water pumps

INACTIVE SEPTIC SYSTEMS

BUILDING 1251

This building was constructed in 1965 and contains 1300 SF.
In the records it is listed as a Research and Testing Shop. It currently has a large infestation of vectors, therefore it is not safe to go inside. The building has been vacant since the mid 90's. The point of contact for this building is Mrs. Eisele.
It contains the following facilities:

- Toilet
- Lavatory

INACTIVE SEPTIC SYSTEMS

BUILDING 1269

This building was constructed in 1966 and contains 3262 SF.
The original service was a Medical Science Laboratory. It has been relegated to a storage facility.
The facilities consisted of:

- Toilet
- Lavatory
- Kitchen Sink with Garbage Disposal

Site Specific Contingency Plan: See Attachment 1

Max. Spill Quantity (gal): 55

Chemical	Container Type
Benzene	NA
Acetonitrile	

REMOVED SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	1102	1952	6'x4'x8'10"	2500
2	1103	1948	7'x9'x3'2"	1412
3	1108	1958	6'x9'6"x6'3"	750
4	1119			
5	1150	1953	4'x9'x6'3"	2500
6	1154			
7	1166	1960		450
8	1175	1949	5'1"x10'4"x6'10"	2970
9	1176	1959		640
10	1265	1992		1200
11	1173			

REMOVED SEPTIC SYSTEMS

BUILDING 1102

Specifications and History: See "Cold War Survey." More information can be seen in the drawings. The drawings that have been found for this building are as follows the Grading Plan (Attachment 35), Septic Tank Details and Boring Log Results (Attachment 36), Leaching Well and Cover Details and Sewer Clean Out (Attachment 37).

Attachment 55c shows where the leach field was located for this building in 1984.

This building has the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Missile Radar Station.
Historic: Radar Triangulation: King I.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1102

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

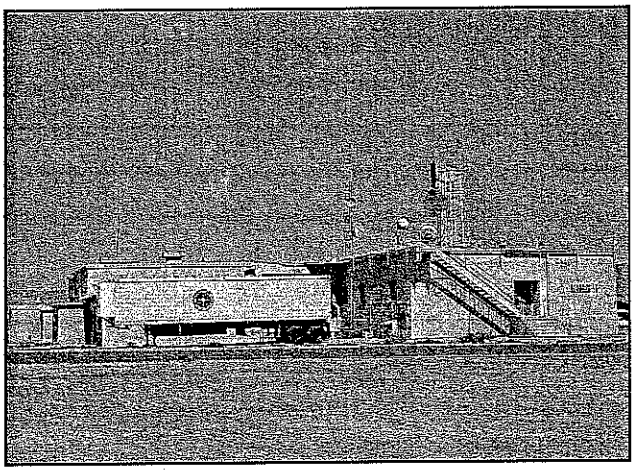
Comments: Essential structural and architectural features remain intact.

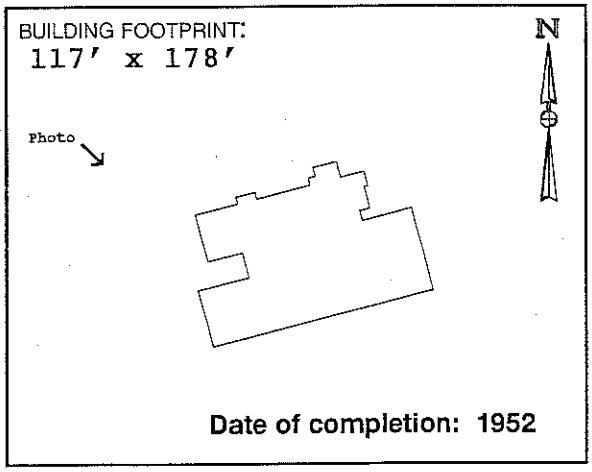
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Recommend listing as part of a Cold War Multiple Property.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1102 is a one-story concrete masonry unit, multi-shaped building with a central corridor running east-west the entire length and single rooms flanking both sides of the corridor. Original footprint shows primarily rectangular shape with a central projecting core. This core is a large open room with an upper balcony around its perimeter. Construction of the original building was completed in 1952, according to "As-built" drawings in CE File #1102-1. Surveillance display room added in 1969 (CE File #1102-1). It is unclear when north elevation additions constructed, although information in Real Property Accountable Record/1102 date the additions as being post-1970. The architect for this project was W. C. Kruger (Santa Fe, NM). The builder is unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1102.

Current Function: Telemetry and Optics. Altitude measurements.

Original Function: Missile Instrumentation Station; Mission Control.

Interim Functions: Missile Radar Station.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1102-1 (c1952).

Foundation: Concrete footing and foundation wall. Column spread footing.

Exterior walls: Concrete masonry units (CMU).

Roof: Bituminous concrete over built-up roof, ltweight concrete, supported by one-way concrete slab using concrete beams and steel beams encased in concrete.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

380

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Eligible under Criteria A and/or C at a national level of significance for important role in early Cold War-era missile and High Speed Test Track mission control and tracking. Further research recommended.

VII. ASSOCIATED BUILDINGS:

Building 1102 supported all missions at White Sands Missile Range and at Holloman Air Force Base until Building 300 and possibly 1527 at White Sands were constructed.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1102 continues to operate as a mission control building, with mostly optics and telemetry functions. The Flight and Instrument Control Room, and the Surveillance Radar rooms are vacant. Originally, missiles were fired using an analog boards (mechanical) system. When operations changed to a digital system in c1978, support moved from the central instrument control room to the north addition off of this room. Nearly all of the original interior finishes remain unchanged.

Suggested routine maintenance: Scrape, prime, and paint all block and concrete surfaces. Remove vegetation and rusted pipes by gas meter. Fill depressions at foundation, and regrade using gravel to promote positive drainage. Fill holes at concrete stoops. Replace wood bumper at dock using similar-sized lumber. Secure panel covers on abandoned electrical panels. Enclose live connections in junction boxes. Scrape, prime, and paint metal stairs. Reattach stair nose treads. Remove miscellaneous debris from building perimeter.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Still situated at the northeast corner of the intersection of Tula Peak Road, and Douglas Road.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The original floor plan remains intact.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Continues to be situated at the intersection of two roads in an isolated setting with few nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Most all original materials have been retained at both the exterior and the interior.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: All original exterior and interior room finishes remain visible. At the south elevation, one window is blocked, one window has been replaced with a door, and the door at the loading dock has been replaced. Most of the north elevation is obscured by the addition of an operations room.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1102 continues to support limited mission control operations.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

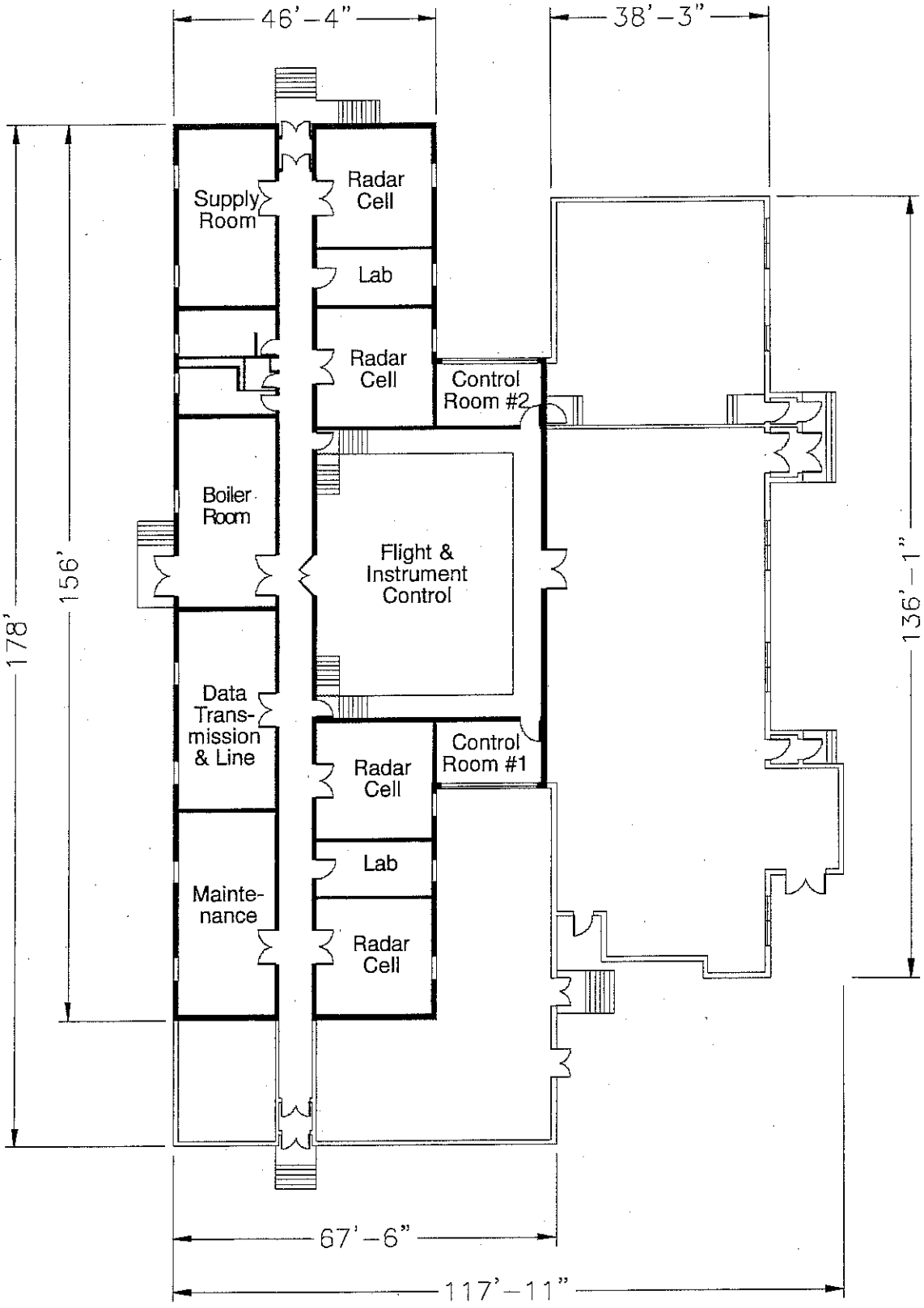
Comments: Building 1102 retains an evident link with its aesthetic and functional historic character.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #49**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1102-1 (c1952)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1102** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-6401* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1103

Specifications and History: See "Cold War Survey" the Layout Plan (Attachment 38) has also been provided.

Attachment 55c shows where the leach field was located for this building in 1984.

Facilities: This building contains the following facilities.

- Tiolets-2
- Urinals-2
- Lavatories-3
- Service Sinks-3

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Timing.
Historic: Telemetering Building.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1103

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance only.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

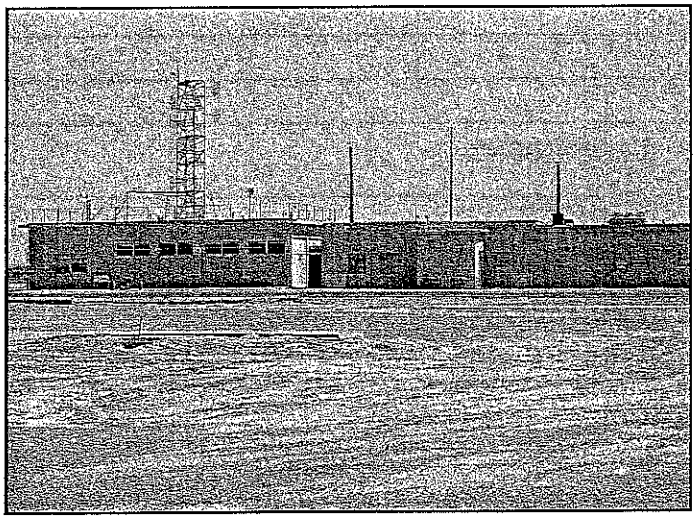
Comments: Few alterations since early improvements.

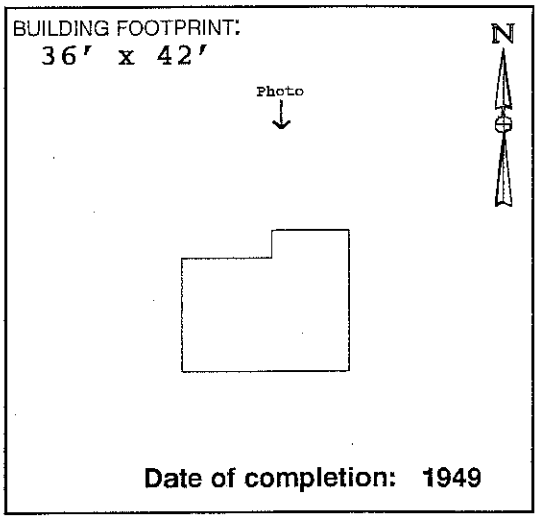
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Research recommended to determine historic use. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1103 is a one-story rectangular building with concrete masonry unit walls, and a flat roof. The original building was completed in 1949, according to "As-built" drawings located in CE File #1103-1. This original construction is centrally located, flanked to the east and west by subsequent additions. Real Property Accountable Record/1103 documents the addition of 2,930 square feet to the original building with the notation "Subsequent Improvements thru May 57." One or both additions to the original building may therefore be considered to be subsequent improvements, rather than additions that compromise historic integrity. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE: (Personal communication with Building 1103 personnel)

Current Function: (East end) Leased by WSMR to transmit mission timings.

Current Function: (West end) Unknown.

Original Function: Telemetering station for data collection of Range missions.

Interim Functions: Real Property Accountable Record/1103: "Communications CTR" (c1962); "Telecom Cen" (c1971); "Comm Fclty" (c1980); "Elec Rsch Rdr" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1103-2 (1967); CE File #1103-1 (1949).

Foundation: Concrete wall footing.

Exterior walls: Painted concrete masonry units (CMU).

Roof: Built-up roof on wood sheathing and 2 x 8 wood joists.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Although perhaps not meeting the "exceptional importance" stipulation imposed on buildings constructed within the last fifty years, Building 1103 may be eligbile for the National Register under Criterion A at a regional or national level in the year 1999. If further research determines that Building 1103 is not eligible as an individual property, consideration should be given to its eligibility as a contributing feature in a Cold War Multiple Property submission for its support of early Cold War-era test launches.

VII. ASSOCIATED BUILDINGS:

Building 1103 was associated during its historic period of significance with Building 1102, mobile data collection vans, and Building 300 at White Sands Missile Range.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1103 appears very different today from depictions on "As-built" drawings dated 1949. It is unclear whether additions to the east and west ends of the original building represent early improvements to the original building, or whether these additions represent later construction that has compromised the historic integrity of the original building. Information obtained from Real Property Record/1103 and field visits seems to indicate that the additions represent early improvements to the original building. If so, Building 1103 retains historic integrity. Further research is needed to verify the construction sequence, and to verify what early Cold War-era research activities were supported by Building 1103. Currently, Building 1103 is leased by the White Sands Missile Range. Aside from minor partitioning at the telemetering room, the original floor plan of the original building shows no alterations. Wood posts (6 x 6) that appear on original drawings to support the roof girders have been removed.

Suggested routine maintenance: Repair, or replace in kind, the exterior wood architectural features, including the soffit, fascia, wood doors, and louvers. Patch spalling concrete at foundation. Remove vegetation at roof.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Original telemetering room is now used as spare equipment storage.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Earlier location plans indicate three utility buildings situated in a row next to Building 1103 to the east. These buildings have been removed. Continues to be set in a somewhat isolated setting, in the vicinity of King-I.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Unable to access some rooms. Those rooms that were accessed, however, appear to have most of the original materials intact. A brick chimney and a metal stack have been removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original windows at north elevation have been covered up at the interior. The telemetering room has been partitioned (reversible).

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity

Comments: Building 1103 personnel are actively engaged in serving as a timing link for White Sands Missile Range tests.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

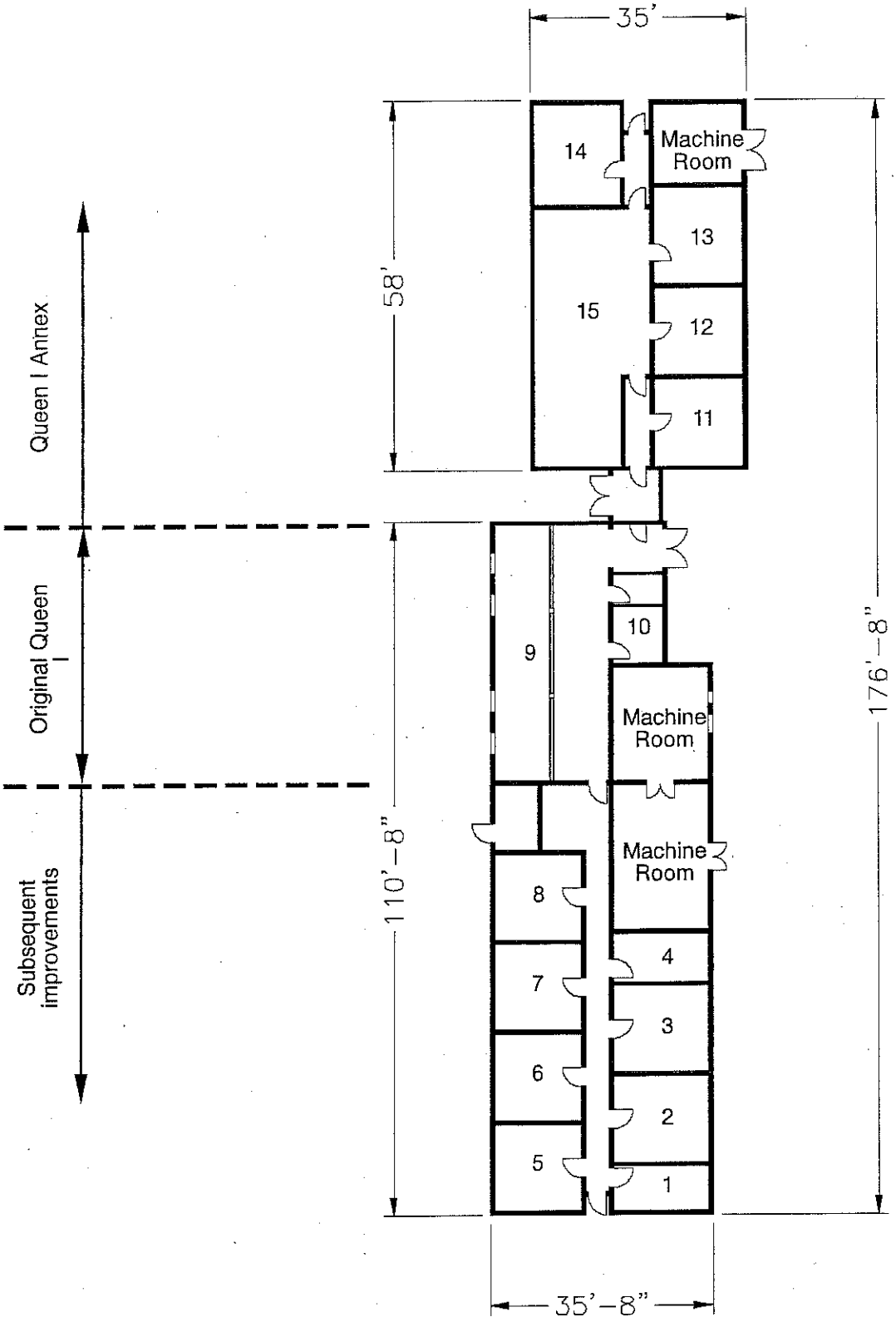
Comments: Building 1103 continues to provide support to the White Sands Missile Range.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #47**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: Dynalectron *Facilities Handbook*, c1964.

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1103** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1108

This building was constructed in 1958 and contains 2626 SF of floor space.
The building was originally built to serve as the telephone exchange. In 1980 it was retitled as a communications facility.
The building contains the following facilities:

- Toilet
- Lavatory
- Janitorial Sink

The drawings provided (Attachment 39-40) show a Utility Plot Plan, Septic Tank Details, Sewer Clean Out, Toilet Room Details and Plan Details.

Attachment 55e shows where the leach field was located for this building in 1984.

Site Specific Contingency Plan: See Attachment 1 and 2

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate into local area on ground

Tank location: North of facility

Fuel Flow - North

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST
MOGAS	250 gal each/ 2 /AST

REMOVED SEPTIC SYSTEMS

BUILDING 1119

This is an Army owned building that contains 2224 SF of floor space. Use and maintenance of the building was transferred to the Air Force in 2005. Prior to the Air Force taking possession the Army had delegated the building to the GSA for use as a vehicle maintenance shop. Once the Air Force took over, the building changed service to an electrical shop and storage facility.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
Diesel	250 gal ea/ 3 /AST
MOGAS	250 gal ea/ 2 /AST
Diesel	750 gal ea/ 3 /AST

Figure 9: Picture of Bldg 1119

REMOVED SEPTIC SYSTEMS

BUILDING 1150

This is also an Army owned building and therefore details are lacking from Holloman's records. The building has 2844 SF.
The original service is unknown, but since the Air Force started using the building it has been used as storage space.
It contains the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 9: Drawing of Bldg 1150

REMOVED SEPTIC SYSTEMS

BUILDING 1154

This is an Army owned building and there is no information in Holloman's files pertaining to this building.

Attachment 55c shows where the leach field was located for this building in 1984.

REMOVED SEPTIC SYSTEMS

BUILDING 1166

This building was constructed in 1960 and contains 4955 SF. The structure is a Test Track Shop/Storage Building known as the "Break Setter Building".
The facilities include:

- Toilets-2
- Urinal
- Lavatory
- Shower

Attachment 41 is a drawing showing the sewer layout and the septic tank details.

Attachment 55c shows where the leach field was located for this building in 1984.

Site Specific Contingency Action: See Attachment 3

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate in local area on ground; if full tank or drum spilled' the substance may reach open ditch.

Material Compatibility: No material incompatibilities

Chemical	Container Type
Oil/Water Separator Waste	500 gal/ 1 / UST

Figure 10: Picture of Bldg. 1166

REMOVED SEPTIC SYSTEMS

BUILDING 1175

Specifications and History: See "Cold War Survey"
Facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

In Attachments 42-44 a trench pit, the toilet room details, the trench junction to UPS, the sanitary sewer manhole and water and sewer piping can be found for Bldg 1175.

Attachment 55c shows where the leach field was located for this building in 1984.

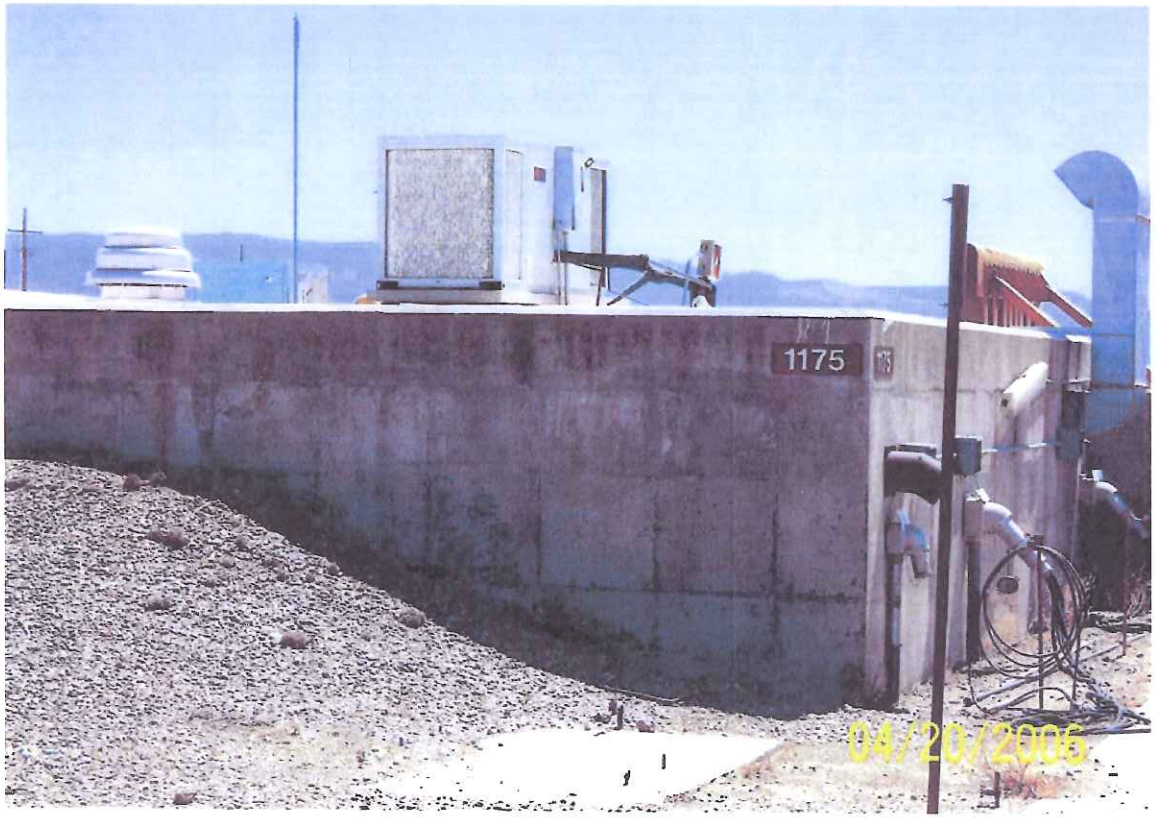


Figure 11: Picture of Bldg 1175

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Blockhouse--"Alpha".
Historic: Blockhouse--"Alpha".
Street Address: 1656 Test Track Rd., HAFB, 88330-7848.

Building Number: 1175

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1175 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

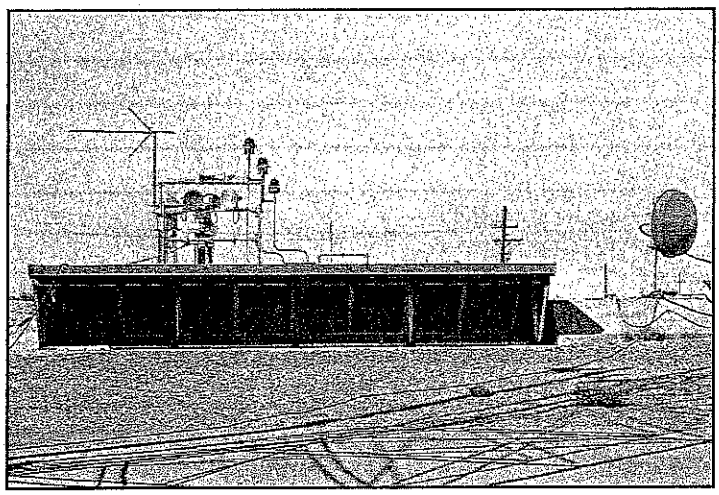
Comments: Modernization at interior to enable continued Test Track use.

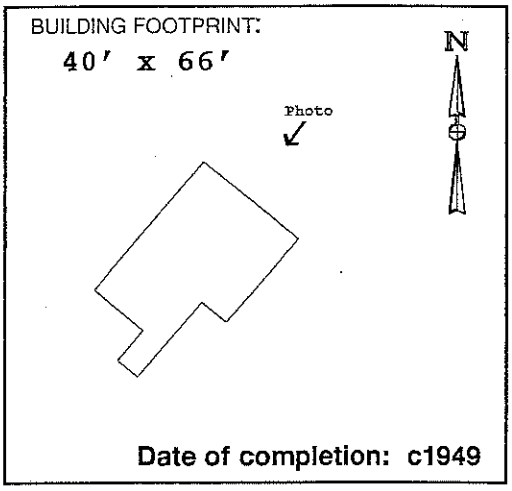
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible for the National Register under Criteria A and/or C.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1175 is an irregularly shaped, one-story concrete structure, built mostly below grade. The building is accessed by a ramp leading down to double doors at the southwest elevation. These doors access the original launch control room constructed in c1949. This entrance, three entrances off of the ramp, and windows facing the track (northeast) are the only visible openings. A 15′ x 32′-6″ addition was constructed at the northwest elevation in 1960 (CE File #1175-2). Another addition, adjacent to northwest side of ramp was completed in 1981 (CE File #1175-3). The ramp extension was also constructed at this time. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1175; CE File #1175-1 (c1949).

Current Function: Launch control facility, High Speed Test Track.

Original Function: Launch control facility, High Speed Test Track.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1175-1 (c1949); CE File #1175 (c1980).

Foundation: Concrete footings.

Exterior walls: Reinforced concrete.

Roof: 3-foot thick reinforced concrete.

Notable interior features, including machinery:
A long row of thick blast-proof windows faces the track to the northeast.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

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VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

"Alpha" Block house Building 1175 is one of the original High Speed Test Track support facilities, constructed c1949 to provide launch control. Recommend that Building 1175 be nominated under Criteria A and C as part of a basewide early Cold War Multiple Property listing.

VII. ASSOCIATED BUILDINGS:

Building 1175 operated, and continues to operate, in support of the high speed test track launching activities, along with Buildings 1162, 1163, 1161, 1645, and the Horizontal Test Stand facility (Buildings 1159 and 1160).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1175 retains historic integrity. Due to its national level of significance under Criteria A and C, recommend that Building 1175 be listed along with the other test track support buildings as part of a Multiple Property nomination to the National Register of Historic Places.

Subsequent improvements to the original Building 1175 augmented the original design and function as a launch control facility for important research conducted at the high speed test track. The interior was renovated in 1984 (CE File #1175-4). Although this renovation obscures original interior finishes, Building 1175 as a whole retains historic integrity of location, design, setting, workmanship, materials, feeling, and association. Of interest to future researchers may be the dramatic changes in computer technology which have occurred since the construction of Alpha Blockhouse: Computers which at that time required several rooms to house, now occupy considerably less space. Launch control operations continue at Alpha Blockhouse, although rooms designed to hold early equipment are virtually empty.

Suggested routine maintenance: Repair bond beam where steel is exposed. Remove vegetation at exterior embankments. Remove debris at front walkway.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Subsequent improvements to the original floor plan added to Building 1175's design and function as a launch control facility.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Except for the construction of smaller buildings in the vicinity, the original setting of Building 1175 near the test track launch pad has been retained.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: The raised wood floor in the console room has been removed. The original light fixtures have been removed. One wood and glass partition has been removed. Sheetrock® walls, carpeting, wainscot, and linoleum have been added to the control room.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original workmanship at the northeast elevation, and at the entrances at the ramp is still visible. Interior renovations hide the original architectural craftsmanship.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1175 continues to function as a launch control facility for the High Speed Test Track.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

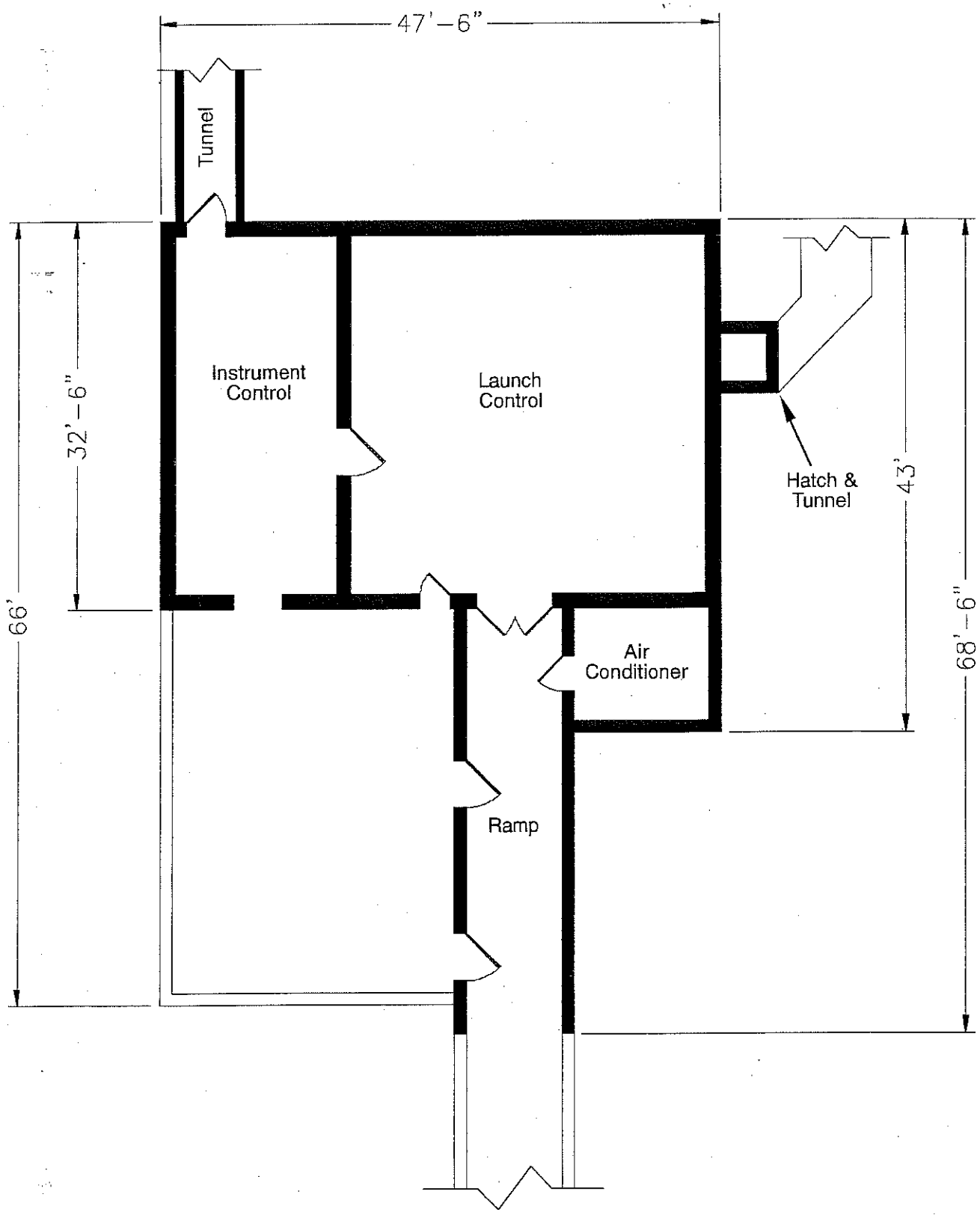
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #35**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1175 (c1980)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1175** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1176

This building was constructed in 1959 and contains 3850 SF.
The building is located at the Test Track and is known as the Sled Launch Shop.
Facilities include:

- Toilet
- Lavatory
- Shower

In Attachments 45-48 a plumbing plan, new drain pit, utility plan, sewer clean out, utilities contour plan and septic tank details can be found for Bldg 1176.

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 12: Picture of Bldg 1176

REMOVED SEPTIC SYSTEMS

BUILDING 1173

This building was constructed in 1957 and contains 17,428 SF.
The building is the main office building at the Test Track.
It contains the following facilities:

- Toilets-8
- Urinals-4
- Lavatories-9
- Janitorial Sinks-2

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 13: Picture of Bldg 1173

REMOVED SEPTIC SYSTEMS

BUILDING 1265

This building was constructed in 1957 and covers 43,388 SF.
This is the Inertial Guidance Facility, previously known as the Guided Weapons Lab.
The building contains the following facilities:

- Toilets-12
- Urinals-6
- Lavatories-12
- Janitorial Sinks-5

This building has been attached to the sewer system at Holloman AFB since before 1984.

In Attachments 49-53 a Water Piping Diagram, Partial Plumbing Plan, Floor Plan, Building, Pavement and Utilities Layout, Sewer Clean Out, and Enlarged Plan can be found for Bldg 1265.

North Wind

Letter No. NW-2008-155

Mr. Dave Griffin
Project Manager
49 CES/CEV
550 Tabosa Ave.
Holloman AFB, NM 88330-8458

11 March 2008

SUBJECT: Technical Memorandum summarizing the decommissioning of inactive septic tanks at HAFB in January of 2008

Dear Mr. Griffin:

Reference Contract Number: W9128F-04-D-0017 DO-0017

Attached please find a copy of the above referenced Technical Memorandum and attached State of New Mexico On-Site Liquid Waste System Abandonment forms. Also attached are copies of the daily reports for the field work.

Please contact me (phone 785-838-3141 or email at tmatzen@northwind-inc.com) or the Program Manager, Rusty Gilbert (phone 210-722-4074 or email at rgilbert@northwind-inc.com) if you have any questions.

Sincerely,

Thomas A. Matzen, P.G.
Project Manager
North Wind, Inc.

Attachments: Technical Memorandum summarizing decommissioning work conducted on inactive septic tanks at HAFB

cc: R. Gilbert (North Wind)
Mr. Tom Zink (USACE Omaha District)
Letter File

North Wind

Technical Memorandum

11 March 2008

To: Mr. David Griffin, Holloman AFB
CC: Mr. Tom Zink, USACE Omaha

From: Tom Matzen, North Wind, Inc

SUBJECT: Decommissioning of Abandoned Septic Tanks Conducted 8 - 24 January 2008 at Holloman AFB

Purpose

This memorandum summarizes the septic tank decommissioning activities conducted on abandoned STLFs from 8 through 24 January 2008 at Holloman AFB.

Description of Work

North Wind, Inc. (NWI) contracted a local septic system installer (Jontel Septic) to decommission 21 abandoned Septic Tanks at Holloman AFB. During the course of the decommission work NWI was requested also to abandon a septic tank at Building 1284 for a total of 22 tanks. North Wind provided a field supervisor to obtain excavation permits, coordinate field activities, and to ensure that quality and safety requirements were met.

Base dig permits were obtained for each of the systems prior to conducting any excavation work necessary to locate the systems. After dig permits were obtained, each system was excavated (if required) to the extent necessary to remove the top of each tank, crush or otherwise perforate the bottom of each tank such that water will not pool in the abandoned tank, and backfill each tank with clean fill per State of New Mexico requirements. Each system was pumped out (if it contained any liquid or sludge), and visually inspected prior to decommissioning.

The required system abandonment forms for each septic tank with accompanying photographs are in Attachment 1. Attachment 2 contains the Daily Progress Report/Quality Control Report Forms. Please note that these forms start at number 29. Forms 1 through 28 were used for daily reporting on the Septic Tank and Leach Field Inspection work.

Interpretation of Findings:

Several tanks were still active and so were not decommissioned. These include the tanks at Buildings 308 (actually an oil/water separator), 1097, 1219, 1226, 1235, and 1239. No septic tanks could be located at Buildings 1200, 1201, and 1269 though we did backfill an earthen pit at Building 1200 and an abandoned sewage treatment plant at Building 1201. Mr. Shawn Quarles, the Base safety person, marked Building 1190 off of the 332 form. Mr. Quarles stated that Building 1190 had been demolished and that there was nothing left at that location. The location of the septic tank at Building 1284 was such that it could not be accessed for demolition. The septic tank at Building 1091 was not abandoned at this time as NWI was unable to obtain a security escort. The tank at Building 1091 will be abandoned while NWI is working on the active septic tank upgrades.

As the abandonment forms indicate, the majority of the septic systems on the original list provided by HAFB were decommissioned per state requirements.

Table 1 summarizes the decommissioning activities and status of the listed septic systems.

Summary of Results

Table 1. Summary of septic system decommissioning activities for abandoned STLFs at HAFB.

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
1	308	01/24/08	Found an oil/water separator still in use.	Notified Base POC that this is an oil/water separator.
2	920	01/16/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
3	921	01/16/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
4	922	01/17/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
5	924	01/17/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
6	1091	01/24/08	Building is in security area. Could not obtain escort.	No action taken at this time. Will decommission tank when we are in the area doing tank replacement work.
7	1097	01/23/08	Found that the septic tank for this building is also hooked into Bldg 1099 and is still in use. Inspected system. This septic tank has no manholes, bottom is damaged and is leaking, no baffle present, leach field is dry and full of dirt.	Turned system back over to active list and inspected system. Inspection form is attached.
8	1190	01/14/08	During the course of obtaining a dig permit for this Bldg the safety person, Mr. Shawn Quarles, marked this one off of the 332 form. Mr. Quarles stated that this Bldg had been demolished and that nothing was left at that location.	Notified Base POC of situation regarding Bldg 1190

North Wind

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
9	1194	01/09/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
10	1196	01/08/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
11	1199	01/09/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
12	1200	01/11/08	No septic tank located. Did locate abandoned earthen pit with a concrete cover. Notified Base POC of situation and received instructions to backfill and abandon.	Removed concrete cover over pit and backfilled pit with clean fill.
13	1201	01/11/08	No septic tank located. Did locate an old abandoned treatment plant. Notified Base POC of situation and received instructions to decommission and backfill the old treatment plant.	Demolished old treatment plant by crushing bottom and caving in sides, then backfilled with clean soil.
14	1219	01/18/08	Septic tank still in use	Notified Base POC that system is still in use
15	1221	01/18/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
16	1226	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.
17	1235	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.
18	1239	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.

North Wind

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
19	1250	01/23/08	Located abandoned septic tank. Also found an old diesel tank still containing fuel.	Opened septic tank, pumped out, crushed bottom, and backfilled tank. Notified Mr. Gomolak at CE Environmental regarding diesel UST.
20	1251	01/23/08	Located abandoned septic tank	Opened tank, pumped out, crushed bottom, and backfilled tank.
21	1269	01/16/08	Could not locate any septic tank. Mr. Vernon (a 30+ year employee) stated that the building had been on the base sewer system for the last 30 years and that the septic tank may have been removed when the moat around the building was removed.	Notified Base POC that there does not seem to be a septic tank at this building.
22	1284 (not on original list, added at request of HAFB POC)	01/16/08	Septic tank hangs over back side of area and is not accessible for removal. This tank is a holding tank with a manual valve that drains to a ditch below. There is no water in the associated Bldg.	Notified Base POC. No action taken.

Future Work

As discussed above in Table 1 the septic tank at building 1091 still must be decommissioned. There are septic systems in that area that require repair and 1091 will be decommissioned when the other septic tanks are being repaired.

Appendix B
Photographic Log

Appendix B

Photographic Log

Building 1190 (OT-C533)

Photo No.	Description
1	Looking east-northeast. The former septic system leach field is in the foreground as marked. The septic tank is between the pickup truck and shed.
2	The former septic tank structure.
3	Auger drilling for the installation of monitoring well OTC533-MW01.
4	Removing septic tank lid.
5	Demolishing septic tank lid.
6	Demolishing septic tank baffles.
7	Removing sludge from tank bottom.
8	Punched drainage hole in bottom of septic tank.
9	Close up of drainage hole punched into bottom of septic tank.
10	Demolishing septic tank walls.
11	Demolishing septic tank walls.
12	Concrete debris moved into septic tank.
13	Backfilling septic tank.
14	Compacting backfill into septic tank.
15	Finish grading former septic tank location.

Photograph No. 1: Looking east-northeast. The former septic system leach field is in the foreground as marked. The septic tank is between the pickup truck and shed.

Photograph No. 2: The former septic tank structure.

Photograph 3: Auger drilling for the installation of monitoring well OTC533-MW01.

Photograph 4: Removing septic tank lid.

Photograph 5: Demolishing septic tank lid.

Photograph 6: Demolishing septic tank baffles.

Photograph 7: Removing sludge from tank bottom.

Photograph 8: Punched drainage hole in bottom of septic tank.

Photograph 9: Close up of drainage hole punched into bottom of septic tank.

Photograph 10: Demolishing septic tank walls.

Photograph 11: Demolishing septic tank walls.

Photograph 12: Concrete debris moved into septic tank.

Photograph 13: Backfilling septic tank.

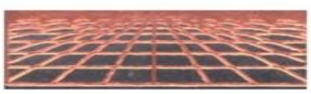
Photograph 14: Compacting backfill into septic tank.

Photograph 15: Finish grading former septic tank location.

Appendix C
Geophysical Report

ULS SERVICES CORPORATION

GEOMARKOUT LOCATING Co a tradename



SAN DIEGO–LA . SF- SAC . SEATTLE . ALASKA . HAWAII- GUAM

1 (800) 528 – 8206 www.geomarkout.com 1 (866) 804 – 5734

---------- *A Veteran Owned Small Business* ----------

5 July 2012

Christopher Long, P.G.
Scientist
Federal Services
Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, TX 77077

Subject: Field Documentation Report for Geophysical Services -
Location of Utilities and Underground Features Associated
With Former UST and Septic System Sites,
Holloman AFB, NEW MEXICO (SHAW PO 783916-000 OP)

Gentlemen:

This report documents the recent Geophysical Survey field work ULS Services Corp completed at the subject site On and between the dates of 11 June 2012 thru 23 June 2012.

SHAW / ULS SERVICES CORP
GEOPHYSCIAL SERVICES
FORMER UST AND SEPTIC SYSTEM SITES
5 JULY 2012

SCOPE OF WORK

Scope of this work is includes geophysical services at approximately 29 Former UST or Septic Systems sites located across Holloman AFB that have reportedly undergone past abandonment in place or excavation activities. Geophysical services are employed in an attempt to locate potential USTs, former UST excavation areas, abandoned septic tanks or excavations and associated leach field areas. Location of underground utilities near these observed features is included. Observations are marked out in field and electronically mapped with GPS data collection and GIS presentation. Survey of each site is approximately 25 by 25 to 100 by 100 feet in size.

METHODS

Methods utilized in performance of this work include: Visual Inspection, Analog Real - Time Electromagnetic Induction Conductivity Detection (EMICD), Magnetic Locating (MGL), Ground Penetrating Radar (GPR), and EM Pipe and Cable Location (EMPCL). A sub-meter WAAS GPS receiver with automatic real -time differential correction and ESRI Arcpad software is utilized to collect observation data. ESRI Arc View 10 GIS software is utilized for mapping presentation.

EMIMD ground induction methods are employed to detect both 1) broad metal mass anomalies (Rectangular Surface Projections) or conductive zones that may be indicative of potential USTs – Septic tanks, conductive metal debris, steel reinforced concrete, UST's, building hosts, piping, building demo materials, drums, sumps or other unknown burial materials; and 2) to detect relative lateral changes in conductive zones of soil or backfill materials relative to native soils. Former UST excavations and septic -leachate material may potentially have a higher conductive response or well drained leachate fill materials associated with septic systems may in some cases exhibit a relatively lower or quiet conductive response relative to surrounding higher conductive soil response. A two-way Cartesian grid pattern of five by five feet is walked within the search area (site). Observations are real time and marked on ground surface with paint and pin flagging. Observations are collected with a sub- meter GPS with automatic differential correction and plotted approximately onto web based imagery.

GPR is utilized to detect and potentially observe former UST excavation sidewalls as well as septic – leach field pit sidewall and fill areas. GPR is also utilized to compliment the EM Pipe and Cable utility survey work by potentially locating conductive as well as non-conductive utilities.

A EM Pipe and Cable Survey is conducted at each site by performing ambient passive live power and communication line sweeps, active ground induction sweeps, and active direct- connect or induction- clamp sweeps using existing conducts or pipes visibly nearby. Multiple active frequencies are utilized for best Detection. Utilities are identified where possible and marked unknown if not identified.

All observations are marked with hi-visibility orange-red marking paint. Some Ares are hi-lighted with black paint due to light soil conditions. GPR boundaries indicating potential septic tank and leach field areas are outlined with black paint. Pin flags are also utilized to mark these boundaries in soft soil and weed areas.

OBSERVATIONS

Site Description

The Project Site (Holloman AFB - Former UST and Septic Systems) is comprised of approximately 29 different environmental site locations (heir in referred to as Sites) . Each sites includes and varies in description from existing active building locations to in-active remote abandoned to former building areas where USTs or Septic systems were utilized in the past. Each Site is fairly flat with sandy to gravelly surface conditions. Some sites include native brush and weeds. Sites near active building areas include asphalt or concrete surfaces, sidewalks and planter areas. ULS field staff helped review historical documentation available of each site in the field. Where available, drawings and photographs were reviewed. When available, reported GPS coordinates from reports, of septic tank locations, were utilized by SHAW field staff to navigate to septic tank location to aid focus search area.

Generally there are no surface indications of USTS or Septic tanks, however some limited features exist at some sites and include potential vent riser pipes and asphalt patching, settling areas, and conidial – rectangular cracks in concrete. Surface indications of septic systems at some sites include potential inactive clean- outs pipes near building and nearby existing upgraded sewer man-hole systems that have been connected to the existing Base sewer collection system. Some septic system sites have open holes , surface erosion, and associated potential underground voids observed near the inactive cleanouts and suspected septic search area.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

General ambient or background EM conditions at this site are categorized as being high or noisy most likely resulting from caliche or saline soil conditions throughout the area. These conditions all result in a high ambient background EMICD response that are difficult to filter out, however, subtle to distinct lateral changes are observed potentially marking position of former UST excavations. Magnetic locator is not affected by saline conditions. GPR response in these conditions is poor to somewhat fair, however, subtle, trends in GPR observations exhibit dipping or high angle (from horizontal) refraction bands indicating potential soil side-wall trends allowing for location of approximate former excavations. The use of EMICD and GPR data in conjunction with historical information and physical observations are all utilized to mark the approximate location of potential former USTs in the field as shown on the GIS imagery maps.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

Similar response is observed near former septic systems. Most all septic tanks are reported to have been abandoned in place or partly crushed in place. Magnetic locator surveys revealed concentrated areas of metal response (metal anomalies) likely from metal plates and rebar in septic tanks in areas near former sewer clean-outs and next to reported septic tank locations where latitude and longitude data is available. EM Induction and GPR transects over these metal anomalies further corroborated these findings. EM Induction survey results near the effluent (down gradient) side of metal anomalies (potential septic tanks) resulted in observation of relatively moderately higher lateral response to zones of low to quiet lateral response zones near the septic tanks relative to the ambient response in surrounding area. GPR data across these zones exhibited very subtle side-wall trends that appear to corroborate with EMICD findings. The use of EMICD and GPR data in conjunction with historical information and physical observations of cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs in the field and as shown on the GIS imagery maps.

CONCLUSIONS and LIMITATIONS

The use of EMICD and GPR data in conjunction with historical information and physical observations of reported building location, vent riser location, boiler room location, existing and abandoned sewer cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs , Septic tanks and leach fields. Ambient soil conductivity at this site is very high and EM and GPR data observed is very subtle. Field trends are used to mark the approximate location of potential targets.

As in any type of survey or investigation to determine characteristics below grade, careful exploratory excavation or drilling may be needed to further help determine a more accurate determination of the subsurface. Use of hand tools and air knifing is also useful to help as a safety measure. Base one- call utilities, as well as, private 811 one –call should be consulted and recalled as necessary.

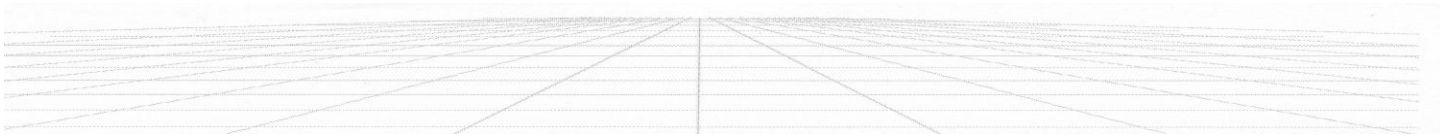
If you have any questions regarding this report please contact me at (206) 384- 2857.

Sincerely,

ULS SERVICES CORPORATION
Geomarkout tradename

Michael W. Benedict
Site Representative

Admin Office/Billing: PO Box 724 Pocatello, Idaho 83204
(208) 234-1441 Fax (208) 234-1507 1 800 301-4420
Seattle / Portland / SAC / Alaska / HWI – AS - GUAM Operations
1 - (866) 804- 5734 / San Diego – LA / Operations 1 - (800) 528-8206



BLDG 1190 SEPTIC SYSTEM
HOLLOMAN AFB

WGS_1984_UTM_Zone_13N
ULS SERVICES CORP
mwb 14 June 2012

0 15 30 60 90 120
Feet

Appendix D
Sample Collection Logs

Sample Collection Log

Shaw Environmental Solutions

- Holloman AFB

Station 1

Manager Christopher Long

Location Code OTC533

RFA / COC Number 144106-H004

Sample Number OTC533-IS-0001-~~MMDDYY~~ 062512

Task

Sample Name OTC533-z-OTC533-IS-0001-MMDDYY-z

Collection Date 06/25/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1005

Sample Purpose ~~Unknown~~ Investigatory

Start Depth 3'

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06/25/12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Station 1

Shaw Solutions

Manager Christopher Long

Location Code OTC533

RFA / COC Number 14106-H004

Sample Number OTC533-IS-0002-~~MMDDYY~~ 062512

Task

Sample Name OTC533-z-OTC533-IS-0002-MMDDYY-z

Collection Date 06/25/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1125

Sample Purpose ~~Unknown~~ Investigatory

Start Depth 10'

End Depth 12'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) *(EB)* *(FB)*

SampleTeam RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06/25/12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat*

Sample Collection Log

Shaw Environmental Solutions

- Holloman AFB

Station 2

Manager Christopher Long

Location Code OTC533

RFA / COC Number 144106-H004

Sample Number OTC533-IS-0003-~~MMDDYY~~ 062512

Task

Sample Name OTC533-z-OTC533-IS-0003-MMDDYY-z

Collection Date 06/25/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1330

Sample Purpose ~~Unknown~~ Investigatory

Start Depth 7' 10' RED

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 9' 12'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06/25/12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Station 2

Shaw Solutions

Manager Christopher Long

Location Code OTC533

RFA / COC Number 114106-H004

Sample Number OTC533-IS-0004-~~MMDDYY~~ 062512

Task

Sample Name OTC533-z-OTC533-IS-0004-MMDDYY-z

Collection Date 06-25-12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1345

Sample Purpose ~~Unknown~~ Investigatory

Start Depth ~~HB~~ 17 BGS

End Depth ~~HB~~ 19 BGS

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06/25/12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

Shaw Solutions

- Holloman AFB

Station 3

Manager Christopher Long

Location Code OTC533 *RFA / COC Number* 144106-H004

Sample Number OTC533-IS-0005-~~MMDDYY~~ 062512 *Task*

Sample Name OTC533-z-OTC533-IS-0005-MMDDYY-z *Collection Date* 06-25-12

Sampling Method ~~Unknown~~ DPT *Sample Type* ~~Unknown~~ Grab *Collection Time* 1240

Sample Purpose ~~Unknown~~ Invest. *Start Depth* 3'

QC Code NORMAL ENVIRONMENTAL SAMPL *End Depth* 5'

Sampling Equip Geoprobe *Sample Matrix* SOIL

QC Partners:
(TB) *(EB)* *(FB)* *SampleTeam* RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Trilium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

6/25/12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat*

Sample Collection Log

Shaw Environmental Solutions

- Holloman AFB Station 3

Manager Christopher Long

Location Code OTC533 *RFA / COC Number* 144106-H004

Sample Number OTC533-IS-0006-~~MMDDYY~~ 062512 *Task* 1

Sample Name OTC533-z-OTC533-IS-0006-MMDDYY-z *Collection Date* 06-25-12

Sampling Method ~~Unknown~~ OPT *Sample Type* ~~Unknown~~ Grab *Collection Time* 1300

Sample Purpose ~~Unknown~~ Investigatory *Start Depth* 10'

QC Code NORMAL ENVIRONMENTAL SAMPL *End Depth* 12'

Sampling Equip *Sample Matrix* SOIL

QC Partners:
(TB) *(EB)* *(FB)* *SampleTeam* RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Rachel Daly 06-25-12 *Reviewed By / Dat*

Sample Collection Log

Shaw Solutions

- Holloman AFB

Station 3

Manager Christopher Long

Location Code FIELDQC

RFA / COC Number 144106-H004

Sample Number OTC533-IS-0007-~~MMDD~~YY-FD 062512

Task

Sample Name FIELDQC-z-OTC533-IS-0007-MMDDYY-FD-z

Collection Date 06-25-12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1305

Sample Purpose ~~Unknown~~ QC

Start Depth 10

End Depth 12

QC Code FIELD DUPLICATE

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) *(EB)* *(FB)*

SampleTeam RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

6-25-12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat*

Sample Collection Log

Shaw Environmental Solutions

- Holloman AFB

Manager Christopher Long

Station 4
MW-01

Location Code OTC533

RFA / COC Number 144106-H004

Sample Number OTC533-IS-0008-~~MMDDYY~~ 062512

Task

Sample Name OTC533-z-OTC533-IS-0008-MMDDYY-z

Collection Date 06-25-12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1400

Sample Purpose ~~Unknown~~ Invest.

Start Depth 3

End Depth 5

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) *(EB)* *(FB)*

SampleTeam RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Trilium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

6/25/12

Shaw

Logged By / Dat Rae Lee Daly

Reviewed By / Dat

Sample Collection Log

Shaw Environmental Solutions

- Holloman AFB

Station 4
MW-01

Manager Christopher Long

Location Code OTC533

RFA / COC Number 144106H004

Sample Number OTC533-IS-0009-~~MMDDYY~~ 062512

Task

Sample Name OTC533-z-OTC533-IS-0009-MMDDYY-z

Collection Date 6/25/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time ~~1407~~ RSD 1410

Sample Purpose ~~Unknown~~ invest.

Start Depth 10'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 12

Sampling Equip

Sample Matrix SOIL

QC Partners:
(TB) *(EB)* *(FB)*

SampleTeam RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06/25/12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat*

Sample Collection Log

Shaw Environmental Solutions

- Holloman AFB

Station 4
MW-01

Manager Christopher Long

Location Code OTC533

RFA / COC Number 149106-H004

Sample Number OTC533-IS-0010-~~MMDDYY~~ 062512

Task

Sample Name OTC533-z-OTC533-IS-0010-MMDDYY-z

Collection Date 062512

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1415

Sample Purpose ~~Unknown~~ Invest.

Start Depth 0

End Depth 2

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) *(EB)* *(FB)*

SampleTeam RO

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06/25/12

Shaw

Logged By / Dat Rachel Daly

Reviewed By / Dat

Sample Collection Log

Shaw Environmental Solutions

- Holloman AFB

Manager Christopher Long

Station 4
MW-01

Location Code OTC533

RFA / COC Number 144106-4009

Sample Number OTC533-IS-0011-~~MMDDYY~~ 062512

Task

Sample Name OTC533-z-OTC533-IS-0011-MMDDYY-z

Collection Date 06-25-12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1430

Sample Purpose ~~Unknown~~ Invest.

Start Depth 23

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 25

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) *(EB)* *(FB)*

SampleTeam RD.

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

6/25/12

Shaw

Logged By / Dat Rachel Daly

Reviewed By / Dat

Sample Collection Log

Shaw Environmental Solutions

- Holloman AFB

Septic Tank

Manager Christopher Long

Location Code OTC533

RFA / COC Number 144106-H004

Sample Number OTC533-SL-0001-~~MMDDYY~~ 062712

Task

Sample Name OTC533-z-OTC533-SL-0001-MMDDYY-z

Collection Date 6/~~25~~27/12

Sampling Method ~~Unknown~~ Scoop + St. St.

Sample Type ~~Unknown~~ Grab

Collection Time 0945

Sample Purpose ~~Unknown~~ Invest.

Start Depth 3' 0"

End Depth 5' 1'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe Scoop

Sample Matrix SLUDGE

QC Partners:

(TB) *(EB)* *(FB)*

SampleTeam RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

6/27/12
~~6/25/12~~

Shaw

Logged By / Dat Rachel Daly

Reviewed By / Dat

Sample Collection Log

Shaw a world of Solutions

Direct Push Boreholes for GW Well Instal - Holloman AFB

Septic Tank

Manager **Christopher Long**

Location Code ~~USTC501~~ OTC533 *RFA / COC Number* 144106-H019

Sample Number ~~USTC501-IS-0001-MMDDYY~~ OTC533-WC-0001-072512 *Task*

Sample Name ~~USTC501-z-USTC501-IS-0001-MMDDYY-ai~~ OTC533-z-OTC533-WC-0001-072512-ai *Collection Date* 7/25/12

Sampling Method ~~Unknown~~ grab *Sample Type* **Unknown** *Collection Time* 1330

Sample Purpose **Investigatory** *Start Depth* 0

QC Code **NORMAL ENVIRONMENTAL SAMPL** *End Depth* 0.5

Sampling Equip Scoop, extention handle, and bowl *Sample Matrix* **SOIL**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* TL, TH

Containers:

Analytical Suite	Cl	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
TCLP VOCs by SW8260C/1311		A	Unknown	1	~~40~~ 250	~~MG~~ mL	~~40 mg Terracore~~ 250 mL glass	~~1(2) + MeOl~~ Cool to 4°C
TCLP SW8015 : GRO		B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
SW8015 : DRO		C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015 : ORO		C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6010C/1311		C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A/1311		C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A/1311		C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
TCLP SVOCs by SW8270D/1311 RIC by 1311		C	Unknown	1/2 0	250	ML	250 ml Glass (8 oz) "	Cool to 4° "

Comments: Sludge sample collected from Bldg 1190 for waste Characterization

Sketch Location:

Shaw *Logged By / Dat* 7/25/12 *Reviewed By / Dat* _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager Christopher Long

Below
Septic Tank

Location Code OTC533

RFA / COC Number 144106 H054

Sample Number OTC533-~~IS-0000-MMDDYY~~ CS 01 092612

Task

Sample Name OTC533-z-OTC533-~~IS-0000-MMDDYY~~-z CS 01 092612

Collection Date 9/26/12

Sampling Method ~~Unknown~~ HAND AUGER

Sample Type ~~Unknown~~ GRAB

Collection Time 14:00

Start Depth 0'-0"

Sample Purpose ~~Unknown~~ CONFIRM

End Depth 0'-6"

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip HAND AUGER / ALUM TRAY

Sample Matrix SOIL

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam TH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
~~Metals by SW6010C~~	~~C~~	~~Unknown~~	~~0~~	250	ML	250 ml Glass (8 oz)	Cool to 4°
~~Metals by SW6020A~~	~~C~~	~~Unknown~~	~~0~~	250	ML	250 ml Glass (8 oz)	Cool to 4°
~~Mercury by SW7471A~~	~~C~~	~~Unknown~~	~~0~~	250	ML	250 ml Glass (8 oz)	Cool to 4°
~~SW8015B : DRO~~	~~C~~	~~Unknown~~	~~0~~	250	ML	250 ml Glass (8 oz)	Cool to 4°
~~SW8015B : ORO~~	~~C~~	~~Unknown~~	~~0~~	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
~~Total CN soil by SW9012~~	~~D~~	~~Unknown~~	~~0~~	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: Confirmation Sample (under abandoned tank)

Sketch Location:

Shaw

Logged By / Dat [signature] 9/26/12

Reviewed By / Dat _____

Sample Collection Log

Shaw - a world of Solutions

- Holloman AFB

Manager Christopher Long

Below
Septic Tank

Location Code OTC533

RFA / COC Number 144106 H054

Sample Number OTC533-~~IS-0040-MMDDYY~~ CS 02 092612

Task

Sample Name OTC533-z-OTC533-~~IS-0040-MMDDYY~~-z CS 02 092612

Collection Date 09/26/12

Sampling ~~Unknown~~ Method Hand Auger

Sample Type ~~Unknown~~ GRAB

Collection Time 14:15

Start Depth 4'-6"

Sample Purpose ~~Unknown~~ CONFIRM

End Depth 5'-0"

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Hand Auger / Alum Tray

Sample Matrix SOIL

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam TH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: Confirmation Sample (Below abandoned tank)

Sketch Location:

Shaw Logged By / Dat [signature] 9/26/12 Reviewed By / Dat _____

Sample Collection Log

- Holloman AFB

MW-01

Shaw a world of Solutions

Manager **Christopher Long**

Location Code **OTC533**

RFA / COC Number 144106 - 17010

Sample Number **OTC533-GW-5331-~~MMDDYY~~** 070412

Task

Sample Name **OTC533-z-OTC533-GW-5331-MMDDYY-z**

Collection Date 070412

Sampling Method ~~Unknown~~ YSI

Sample Type ~~Unknown~~ Grab

Collection Time 1140

Sample Purpose ~~Unknown~~ Invest.

Start Depth

End Depth

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sampling Equip YSI 6820

Sample Matrix **GROUND WATER**

QC Partners:

(TB) TB-070412 (EB) _____ (FB) _____

SampleTeam CH/CC

Containers:

Analyticall Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SW8015B : GRO	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	C	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
SW8015B : ORO	D	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015B : DRO	D	Unknown	2	1	L	1 Liter Amber Glass	H2SO4
PCBs by SW8082A	E	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Explosives by SW8330A	F	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Tritium by 906.0 Mod	G	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Mercury by SW7470A	H	Unknown	0	500	ML	500 ml Poly Container	HNO3
Metals by SW6020A	H	Unknown	0	500	ML	500 ml Poly Container	HNO3
Metals by SW6010C	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
Total CN water by 335.4	I	Unknown	1	500	ML	500 ml Poly Container	NaOH
TDS by 160.1	J	Unknown	1	500	ML	500 ml Poly Container	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Wir 7/4/12 *Reviewed By / Dat* _____

Sample Collection Log

Page: ~~19 of 49~~ 1/1

Shaw Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code ~~FIELDQC~~ IDW

RFA / COC Number HO 38

Sample Number ~~OTC644-GW-0441-MMDDYY-FD~~ LDY-IDWD1-090412

Sample Name ~~FIELDQC-2-OTC644-GW-0441-MMDDYY-FD-z~~

Task

Collection Date 09/04/2012

Sampling Method ~~Unknown~~ Composite

Sample Type ~~Unknown~~ Soil

Collection Time 1330

Sample Purpose ~~Unknown~~ IDW characterization

Start Depth NA

QC Code ~~FIELD DUPLICATE~~ NA

End Depth NA

Sampling Equip Stainless steel Trowel/Bowl/Aluminum

Sample Matrix ~~GROUND WATER~~ IDW Soil

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam LaThom, Hodu

Containers:

	Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
1)	VOCs by SW8260C TCLP VOCs	A	Unknown	~~3~~ 1	~~40~~ 8oz	~~ML~~	~~40 ml VOA Vials~~ Glass	~~HCL~~ Cool to 4°C
	~~SW8015B : GRO~~	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
2)	SVOCs by SW8270D TCLP SVOCs / other organics	EB	Unknown	~~2~~ 1	8	x oz	~~1 Liter Amber Glass~~ Glass	Cool to 4°
	~~SW8015B : GRO~~	B	Unknown	0	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~SW8015B : DRO~~	B	Unknown	2	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~PCBs by SW8082A~~ ~~TCLP~~	E	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
	~~Explosives by SW8330A~~	F	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
3)	~~Tritium by 906.0 Mod~~ RCI	C	Unknown	~~2~~ 1	~~1~~ 8oz		~~1 Liter Amber Glass~~ Glass	~~Cool to 4°C~~ Cool to 4°C
4)	Mercury by SW7470A TCLP Mercury	~~F~~ D	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~ oz	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
5)	Metals by SW6020A TCLP Metals	~~H~~ E	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
	~~Metals by SW6010C~~	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
	~~Total CN water by 335.4~~	I	Unknown	1	500	ML	~~500 ml Poly Container~~	NaOH
	~~TDS by 160.1~~	J	Unknown	1	500	ML	500 ml Poly Container	~~Cool to 4°~~

Comments: Composite Soil sample for TCLP analyses of IDW cuttings rolloff at Lay down Yard, 09/04/12

Sketch Location: Rolloff box Composite Sample @ Lay down Yard.

Analyses: TCLP VOCs, TCLP SVOCs, TCLP metals, TCLP Mercury, RCI

LDY = Lay down Yard

~~Shaw~~ *Logged By / Dat* Mel Hall *Reviewed By / Dat* _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code BULK WATER TANK

RFA / COC Number 144106 H070

Sample Number HAFB-IDW-BULK WATER-0001-111612

Task 144106.JM20000

Sample Name HAFB-IDW-BULK WATER-0001-111612

Collection Date 11/16/12

Sampling Method BAILER

Sample Type GRAB

Collection Time 13:00

Sample Purpose CONFIRM IDW

Start Depth N/A

QC Code

End Depth N/A

Sampling Equip DISPOSABLE BAILER

Sample Matrix **WATER**

QC Partners:

(TB) (EB) (FB)

SampleTeam JH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	B	Unknown	4	8	8OZ	Amber Glass	Cool to 4°
SW8015 : ORO	C	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015 : DRO	C	Unknown	1	1	L	1 Liter Amber Glass	H2SO4
Metals by SW6020A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
METALS by SW6020A	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Mercury by SW7470A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Metals by SW6010C	D	Unknown	1	500	ML	500 ml Poly Container	HNO3
	E		1	500	ML	500 ml Poly Cont	Cool to 4°
SW8015 : GRO	F	Unknown	3	40	ML	40 ml VOA Vials	HCL

Comments: SAMPLE COLLECTED FROM BULK WATER STORAGE TANK AFTER ALL WATER DRUMS WERE CONSOLIDATED. SENT BOTH A PRESERVED AND UNPRESERVED 500ML POLY FOR METALS. SPOKE WITH LAB AND THEY SAID TO SEND UNPRESERVED, BUT I THINK MAYBE THEY MADE A MISTAKE.

Sketch Location:

Shaw Logged By / Dat

Reviewed By / Dat

Appendix E
Boring Logs

Boring ID: OT-C533-Station 1

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1190

Date Completed: 6/25/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4095.30
Y Coordinate: 682739.5783
X Coordinate: 1686318.0278

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); light brown to white; dry; soft.		Hand auger from 0 - 5 ft. Began drilling on 6/25/12.
5		OTC533-IS-0001-062512	NR		Same as above (0 ft).	ML	
10		OTC533-IS-0002-062512	NR		Same as above (0 ft).		
					Lean CLAY (CL); mottled red and white; dry; medium stiff. Note: gypsum crystals present.	CL	
15							Total depth = 14 ft. Reached total depth on 6/25/12. **Water table not encountered in this boring.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/25/13 11:14 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C533-Station-2

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1190

Date Completed: 6/25/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4094.86
Y Coordinate: 682708.3574
X Coordinate: 1686319.9652

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		FILL; coarse gravel; light brown; dry; loose.		Hand auger from 0 - 5 ft. Began drilling on 6/25/12.
					SILT (ML); light brown; dry; soft; very fine to coarse sand; trace fine gravel.		
5			NR		SILT (ML); light brown; dry; soft; very fine to coarse sand.	ML	
10		OTC533-IS-0003-062512	NR		Same as above (5 ft). Lean CLAY (CL); mottled red and white; dry; medium stiff. Note: gypsum present.		
15		OTC533-IS-0004-062512	NR		Same as above (10.5 ft); dry to damp; medium stiff to stiff; medium to high plasticity.	CL	
20			NR				Total depth = 20 ft. Reached total depth on 6/25/12. **Water table not encountered in this boring.
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/25/13 11:14 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C533-Station-3

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1190

Date Completed: 6/25/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4094.98
Y Coordinate: 682697.3595
X Coordinate: 1686324.3340

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); light brown to white; dry; soft.		Hand auger from 0 - 5 ft. Began drilling on 6/25/12.
5		OTC533-IS-0005-062512	NR		Same as above (0 ft); light brown.	ML	
10		OTC533-IS-0006-062512 and OTC533-IS-0007-062512-FD	NR		Same as above (0 ft); light brown.		
15					Lean CLAY (CL); mottled red and white; dry; medium stiff. Note: gypsum crystals present.	CL	Total depth = 14 ft. Reached total depth on 6/25/12. **Water table not encountered in this boring.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/25/13 11:15 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C533-Station-4 (OTC533-MW01)

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1190

Date Completed: 6/25/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Top of PVC Riser Pipe AMSL (ft): 4094.68
Y Coordinate: 682679.5367
X Coordinate: 1686250.5823

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0		OTC533-IS-0010-062512	NR		SILT (ML); light brown to white; dry; soft; trace fine to medium sand.	ML	Hand auger from 0 - 5 ft. Began drilling on 6/25/12.
5		OTC533-IS-0008-062512	NR		Same as above (0 ft); brown.	ML	
					Silty SAND (SM); dry; loose.	SM	
					SILT (ML); greenish brown; dry to damp; medium stiff.	ML	
10		OTC533-IS-0009-062512	NR		Lean CLAY (CL); mottled red and white; dry; medium stiff.	CL	
15			NR		Poorly graded SAND with Silt (SP-SM); dry; medium dense. Note: gypsum present.	SP-SM	
					Lean CLAY (CL); red; damp; medium stiff to stiff. Note: gypsum crystals present.	CL	
20			NR		Same as above (15 ft); moist at bottom.	CL	
25		OTC533-IS-0011-062512	NR	▽	Same as above (15 ft); saturated; soft to medium stiff.	CL	Saturated @ 25 - 26 ft.
					Same as above (15 ft); moist.	CL	Moist @ 26 - 29 ft.
30					Clayey SAND (SC); red; wet to saturated;	SC	

Boring ID: OT-C533-Station-4 (OTC533-MW01)

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1190

Date Completed: 6/25/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Top of PVC Riser Pipe AMSL (ft): 4094.68
Y Coordinate: 682679.5367
X Coordinate: 1686250.5823

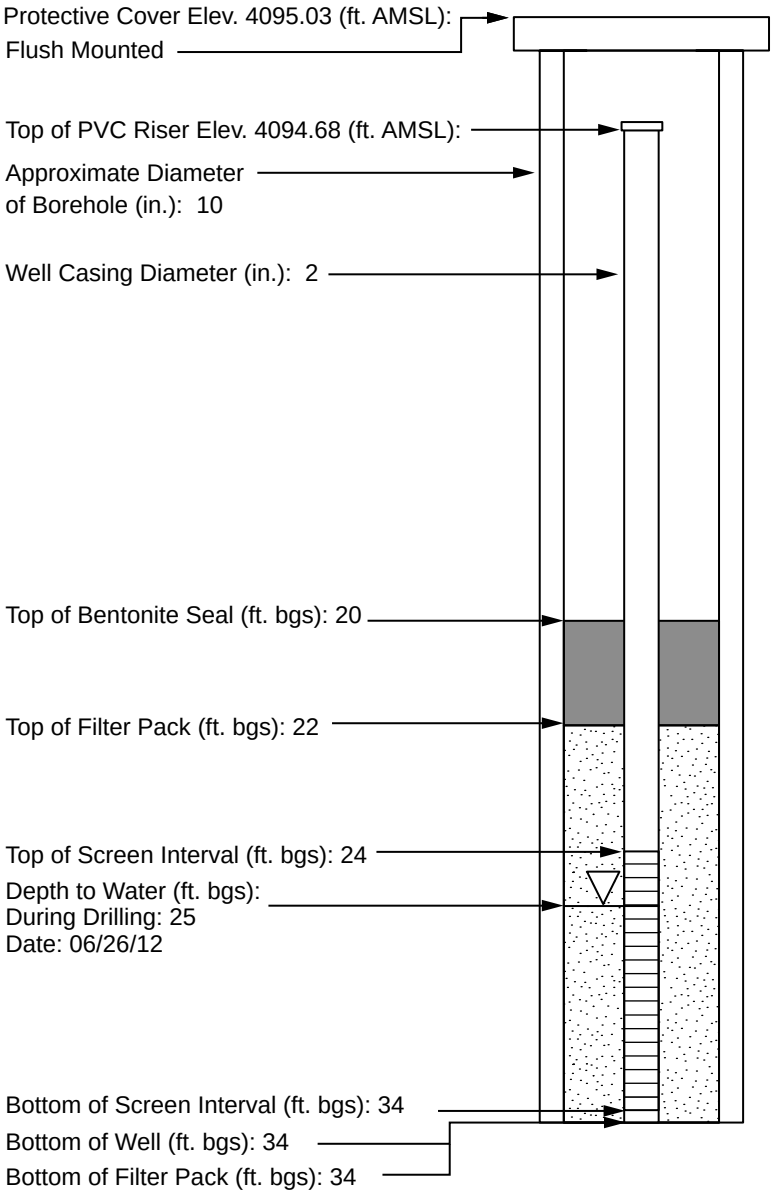
Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
30			NR		dense.		Total depth = 30 ft. Reached total depth on 6/25/12.
35							
40							
45							
50							
55							
60							

Appendix F
Well Construction Diagram

Well Construction Diagram

Project: Holloman AFB
Location: OT-C533
Client: USAF
Subcontractor: Major Drilling
Driller: K. Burkhead
Drilling Method/Rig Type: DPT/Auger
Shaw Field Representative: B. Squire

Well Number: OTC533-MW01
Site Location: Building 1190
Installation Date: 06/26/2012
Completion Date: 06/26/2012
Grid Northing: 682679.5367
Grid Easting: 1686250.5823
NAD: 83 SPCS NM Central
NAVD: 88



Not To Scale

Protective Casing: Circular
Type: Flush Mount
Dimensions (in.): 8
Length (in): 10
Guard Post: NA

Ground Seal (Surface pad):
Dimensions (ft.): 2 x 2
Type: Concrete

Annular Space Seal:
Type: Quikcrete and Quikgel Bentonite
Installation: Gravity

Bentonite Seal:
Manufacturer: Enviro Plug
# of Bags: 2 (50 lbs each)
Type: 3/8" Pellets
Installation: Gravity
Hydration time (hrs): 1

Filter Pack Material:
Manufacturer: DSI
Product Name: Well Gravel Pack
Size: GP#3
# of Bags: 3 (50 lbs each)
Installation: Gravity

Well Casing Used (ft.):
Manufacturer: Silverline
Type: PVC Schedule 40
Diameter (in.): 2

Well Screen Casing:
Manufacturer: DSI
Type: 2" Pre-pack w/ vf SS Mesh w/ 1A Sand
Slot Size (in.): 0.010
Slot Type: Factory

Sump/End Cap (in.): 4 (PVC)
Backfill Material: NA

Appendix G
Well Purge Record

Shaw® Shaw E & I

EXAMPLE
WELL PURGE RECORD

Project Name: Holloman AFB 144106

Location: OTC533 (Bldg 1190) Well/Piez. No.: OTC5331

Personnel: CH, CL Date Installed: _____

Date (Start/End): 7/4/12 Csg. Diameter (I.D.): 2"

Method of Development: NA Total Depth (ft. TOC): 35.22'

☐ Surging ☐ Bailing ☐ Pumping ☒ Other (State Method) Sampling

☐ Original Development ☐ Redevelopment Development Date: _____

Depth to water ~~before developing well~~ Pre-tubing: 24.70 ft btoc

		Volume (V)	Purge Factor	Volume To Purge
Height of Water Column: _____	feet _____ =	_____ gal.*	_____ =	_____

$V = (B * r_c^2 * L_c * 7.48) + (B*(r_w-r_c)^2*L_s*ø_s*7.48) =$ _____ gallons (See Notes below)

Depth purging from: 34' feet Time purging begins: 1049, 7/4/12

Weather: Sunny, 80's Screened Interval (ft. BGL): _____

Equipment Nos.: pH Meter NA EC Meter NA Turbidity Meter NA

Equipment decontaminated prior to development Y X N _____

Describe USI 6820 #48364

Date	Time	Water Level (ft. below TOC)	Volume Removed ~~(gal.)~~ L	Temp (C or F)	pH	~~EC~~ Cond.	Turbidity NTU	D.O. mg/L	~~Comments~~ ORP	TDS (g/L)
7/4/12	1049	24.79	0	21.98	7.32	4.922	721.4	1.91	83.4	3.193
"	1054	24.80	2.5	21.07	6.97	4.709	830.4	1.13	107.8	3.090
"	1059	24.80	5	20.93	6.93	4.654	467.4	0.94	120.3	3.023
"	1104	24.82	7.5	20.74	6.93	4.656	236.5	0.90	126.9	3.027
"	1109	24.81	10.0	20.72	6.93	4.656	133.9	0.88	130.1	3.025
"	1114	24.80	12.5	20.65	6.94	4.637	82.6	0.87	133.5	3.013
"	1119	24.81	15	20.63	6.94	4.622	64.7	0.82	135.9	3.004
"	1124	24.82	17.5	20.70	6.94	4.607	48.5	0.81	138.1	2.995

Notes:

- Water levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to 0.1 pH units
- Electrical conductivity (EC) – Reported to the nearest 10% mhos/cm or µmho/cm @25 C or in mS/cm of instrument set range
- Water temperature – Reported to the nearest 0.1 C or F
- Dissolved oxygen (D.O.) report in 0.1 mg/L
- Turbidity report in NTV nearest whole #

Where:

B=3.14
$ø_s$=porosity of the sand pack
r_c =radius of the well casing and screen in feet
L_c=length of water column inside the casing and screen in feet
r_w =radius of the well bore in feet
L_s =length of saturated portion of the sand pack in feet
7.48 gallons/cubic foot=conversion from cubic feet to gallons

Shaw® Shaw E & I

EXAMPLE
WELL PURGE RECORD Continuation sheet

Project Name: HAFB 144106

Location: OTC533 (Bldg 1190) Well/Piez. No.: OTC5331

Personnel: CH, CL Date Installed: _____

Date (Start/End): 7/4/12 Csg. Diameter (I.D.): 2"

Method of Development: NA Total Depth (ft. TOC): 35.22'

☐ Surging ☐ Bailing ☐ Pumping ☐ Other (State Method) _____

☐ Original Development ☐ Redevelopment Development Date: _____

Depth to water before developing well: _____

		Volume (V)	Purge Factor	Volume To Purge
Height of Water Column:	_____ feet	_____ gal.*	_____	= _____

$V = (B * r_c^2 * L_c * 7.48) + (B*(r_w-r_c)^2*L_s*\phi_s*7.48) =$ _____ gallons (See Notes below)

Depth purging from: 34' feet Time purging begins: 1125 pumpoff 1205

Weather: _____ Screened Interval (ft. BGL): _____

Equipment Nos.: pH Meter _____ EC Meter _____ Turbidity Meter _____

Equipment decontaminated prior to development Y _____ N _____

Describe _____

Date	Time	Water Level (ft. below TOC)	Volume Removed ~~(gal.)~~ L	Temp (C or F)	pH	~~EC~~ Cond.	Turbidity NTU	D.O. mg/L	~~Comments~~ ORP	TDS (g/L)
7/4/12	1129	24.81	20	20.94	6.94	4.596	44.2	0.80	140.0	2.987
"	1134	24.82	22.5	20.102	6.94	4.595	36.9	0.82	142.2	2.984
"	1139	24.80	25	20.90	6.94	4.582	32.5	0.84	143.8	2.979
"	1140	Sample	Collected							

Notes:

- Water levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to 0.1 pH units
- Electrical conductivity (EC) – Reported to the nearest 10% mhos/cm or
- µmho/cm @25 C or in mS/cm of instrument set range
- Water temperature – Reported to the nearest 0.1 C or F feet
- Dissolved oxygen (D.O.) report in 0.1 mg/L
- Turbidity report in NTV nearest whole #

Where:

B=3.14
ϕ_s=porosity of the sand pack
r_c=radius of the well casing and screen in feet
L_c=length of water column inside the casing and screen in

r_w=radius of the well bore in feet
L_s=length of saturated portion of the sand pack in feet
7.48 gallons/cubic foot=conversion from cubic feet to gallons

final DTW - 24.76'

Contract No. FA8903-09-D-8580, Task Order No. 0013 • ina • Revision 0 • October 2013 • WERC-09-13-071

Appendix H
NMED On-Site Liquid Waste System Abandonment Form

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
ON-SITE LIQUID WASTE SYSTEM ABANDONMENT

NMED Permit No.: NM6572124422

System Owner's Name: A. David Budak, Deputy Base Civil Engineer

Address: 550 Tabosa Avenue
Holloman AFB, NM 88330

BUILDING SEWER: OTC-533 Bldg. 1190

____ Connected to Sewer Lines or Plugged/Capped based on UPC Requirements

ON-SITE LIQUID WASTE SYSTEM TYPE:

- [X] Septic Tank
- [ ] Seepage Pit
- [ ] Sec./Tert. Treatment Unit
- [ ] Other:
- [ ] Holding Tank
- [ ] Cesspool

ABANDONMENT PROCEDURE:

- ____ System Pumped
- X Bottom of System Opened or Ruptured or Unit Collapsed
- X System filled with Earth, Sand, Gravel, Concrete, or Other Approved Material
- ____ Top Cover Removed or Collapsed
- ____ System Filled to the Top of Sidewalls or above the Level of any Outlet Pipe
- ____ System Filled Level with Top of Ground Surface

COMMENTS/VIOLATIONS:

ABANDONMENT PERFORMED BY:

Company Name: Shaw Environmental, Inc.

Address: 1401 Enclave Parkway, Ste. 250
Houston, TX 77077

NMED ACTION TAKEN:

- [ ] Abandonment **Approved**
- [ ] Abandonment **Approved w/conditions** (See Comments/Violations)
- [ ] Abandonment **Not Approved** (See Comments/Violations)

FINAL APPROVAL:

- [ ] Granted
- [ ] Not Granted

NMED Inspector Date

OK - If Abandoned and meets Requirements	N/C - Not Compliant
N/I - Not Inspected	N/V - Not Verified
N/A - Not Applicable	

Appendix I
Site Survey Data

Revised Rpt
09/11/2013
(re: TU/US-C513)
p. 7 of 10

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	682987.8550	1687022.9920	4098.16	BASE	682789.9107	1686534.0572
2	678390.1010	1678735.5020	4064.77	CP-52-P-19	678193.4892	1678248.9690
3	683252.1480	1680789.5360	4078.80	CP-55-JACK	683054.1271	1680302.4077
4	681667.1260	1694574.3780	4140.57	CP-56-AIR	681469.5645	1694083.2546
5	669733.4460	1682234.2110	4048.59	HAFB-07-07	669539.3431	1681746.6640
6	669695.2030	1718768.4150	4157.95	ALAMOAIR	669501.1112	1718270.2797
7	674362.7100	1713591.4300	4160.17	F248	674167.2655	1713094.7951
8	676850.6600	1718114.2590	4193.99	E-248	676654.4944	1717616.3133
50	691964.7620	1687201.2770	4140.90	MALONE	691764.2160	1686712.2905
51	662077.1700	1670356.4250	4077.10	BATE	661885.2861	1669872.3205
52	678390.1080	1678735.5040	4066.10	P 19	678193.4962	1678248.9710
53	644127.0780	1700529.8000	4039.00	MONT	643940.3964	1700036.9506
54	676850.6920	1718114.2670	4193.99	E 248	676654.5264	1717616.3213
55	683252.1970	1680789.5390	4080.20	JACK	683054.1761	1680302.4107
56	681667.0380	1694574.3640	4141.20	AIR	681469.4765	1694083.2406
82	678193.4999	1678248.9801	4064.92	P	677996.9451	1677762.5882
84	676654.5300	1717616.3305	4192.77	E	676458.4212	1717118.5291
85	683054.1798	1680302.4198	4079.02	JACK	682856.2163	1679815.4327
86	681469.4802	1694083.2497	4140.00	AIR	681271.9760	1693592.2686
100	685975.0760	1686614.9100	4101.87	OT-C534-PVC	685776.2660	1686126.0934
101	685975.4260	1686614.8310	4102.28	OT-C534-CASING	685776.6159	1686126.0145
102	685952.4860	1686626.9650	4101.89	OT-C534-W2-PVC	685753.6825	1686138.1449
103	685952.6870	1686626.9300	4102.33	OT-C534-W2-CASING	685753.8834	1686138.1099
104	685939.9110	1686581.7340	4101.89	OT-C534-W1-CASING	685741.1111	1686092.9270
105	685939.6450	1686581.7790	4101.57	OT-C534-W1-PVC	685740.8452	1686092.9720
106	685924.3640	1686619.9800	4101.81	OT-C534-W4-PVC	685725.5687	1686131.1620
107	685924.6590	1686619.8790	4102.23	OT-C534-W4-CASING	685725.8636	1686131.0610
108	685934.1180	1686578.3320	4101.72	OT-C534-LEACH-NG	685735.3198	1686089.5260
109	685935.7830	1686600.7340	4101.88	OT-C534-LEACH-NG	685736.9843	1686111.9215
110	685938.2680	1686607.0980	4101.88	OT-C534-LEACH-NG	685739.4686	1686118.2837
111	685951.4240	1686604.4600	4101.90	OT-C534-LEACH-NG	685752.6208	1686115.6465
112	685953.8200	1686601.1380	4101.88	OT-C534-LEACH-NG	685755.0161	1686112.3254
113	685953.2500	1686596.8650	4101.88	OT-C534-LEACH-NG	685754.4463	1686108.0537
114	685946.2830	1686578.3790	4101.81	OT-C534-LEACH-NG	685747.4813	1686089.5730
115	685945.3070	1686576.3400	4101.88	OT-C534-LEACH-NG	685746.5056	1686087.5346
116	685940.6850	1686575.6580	4101.79	OT-C534-LEACH-NG	685741.8849	1686086.8528
117	685952.3510	1686614.8200	4102.03	OT-C534-LEACH-NG	685753.5475	1686126.0035
118	685953.0040	1686623.0300	4102.13	OT-C534-LEACH-NG	685754.2004	1686134.2111
119	685945.6920	1686623.1960	4102.03	OT-C534-LEACH-NG	685746.8905	1686134.3770
120	685944.8810	1686615.5440	4101.97	OT-C534-LEACH-NG	685746.0797	1686126.7272
121	685948.0570	1686615.1700	4101.97	OT-C534-FLINE-NG	685749.2548	1686126.3534
122	685947.7680	1686606.3420	4101.81	OT-C534-FLINE-NG	685748.9659	1686117.5279
123	685953.2050	1686618.0690	4102.08	OT-C534-ENFLU-NG	685754.4013	1686129.2515
124	685968.5800	1686611.5870	4102.06	OT-C534-ENFLU-NG	685769.7718	1686122.7714
125	686021.5760	1686604.3860	4102.49	OT-C534-ENFLU-NG	685822.7525	1686115.5725
126	686051.0660	1686600.5520	4102.82	OT-C534-ENFLU-NG	685852.2339	1686111.7396
127	682943.9250	1686529.5770	4094.74	OT-C536-STATION1-NG	682745.9934	1686040.7852
128	682925.1900	1686534.9010	4094.63	OT-C536-STATION2-NG	682727.2639	1686046.1076
129	682914.0740	1686530.8350	4094.17	OT-C536-STATION3-NG	682716.1511	1686042.0428
130	682900.2750	1686534.1950	4094.40	MW-OT-C5361-CASING	682702.3561	1686045.4018
131	682900.0410	1686534.2560	4094.03	MW-OT-C5361-PVC	682702.1222	1686045.4628
132	682892.0960	1686514.3610	4094.08	OT-C536-LEACH-NG	682694.1795	1686025.5736
133	682905.9860	1686504.4840	4093.98	OT-C536-LEACH-NG	682708.0654	1686015.6994
134	682914.9460	1686505.2970	4094.10	OT-C536-LEACH-NG	682717.0228	1686016.5122
135	682919.4610	1686521.1490	4094.40	OT-C536-LEACH-NG	682721.5365	1686032.3596
136	682921.1340	1686534.7310	4094.42	OT-C536-LEACH-NG	682723.2091	1686045.9377
137	682919.5910	1686545.0230	4094.72	OT-C536-LEACH-NG	682721.6665	1686056.2267
138	682912.1700	1686551.2270	4094.60	OT-C536-LEACH-NG	682714.2477	1686062.4289
139	682897.7180	1686551.9240	4094.16	OT-C536-LEACH-NG	682699.7998	1686063.1257
140	682892.5110	1686549.8820	4094.18	OT-C536-LEACH-NG	682694.5943	1686061.0843
141	682922.3680	1686533.4440	4094.42	OT-C536-TANKPIT-NG	682724.4427	1686044.6510
142	682920.9800	1686525.5880	4094.39	OT-C536-TANKPIT-NG	682723.0551	1686036.7973
143	682928.0220	1686524.4280	4094.63	OT-C536-TANKPIT-NG	682730.0951	1686035.6377
144	682929.2370	1686532.7090	4094.62	OT-C536-TANKPIT-NG	682731.3097	1686043.9163
145	682949.7020	1686528.9800	4094.75	OT-C536-ENFLU-NG	682751.7688	1686040.1883
146	682921.2900	1686528.9090	4094.41	OT-C536-ENFLU-NG	682723.3650	1686040.1174
147	682916.2970	1686530.1310	4094.27	OT-C536-ENFLU-NG	682718.3735	1686041.3390
148	682877.6850	1686739.3620	4095.03	OT-C533-MW-CASING	682679.7726	1686250.5094
149	682877.4490	1686739.4350	4094.68	OT-C533-MW-PVC	682679.5367	1686250.5823
150	682884.2550	1686735.8390	4094.76	OT-C533-LEACH-NG	682686.3407	1686246.9874
151	682877.4700	1686734.1690	4094.84	OT-C533-LEACH-NG	682679.5577	1686245.3179

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
152	682871.6400	1686736.6530	4094.83	OT-C533-LEACH-NG	682673.7294	1686247.8011
153	682869.4200	1686738.9370	4094.89	OT-C533-LEACH-NG	682671.5100	1686250.0845
154	682868.8760	1686741.4810	4094.99	OT-C533-LEACH-NG	682670.9662	1686252.6277
155	682867.8710	1686756.1100	4095.03	OT-C533-LEACH-NG	682669.9615	1686267.2525
156	682857.6950	1686766.0680	4095.35	OT-C533-LEACH-NG	682659.7884	1686277.2076
157	682855.8760	1686772.9280	4095.39	OT-C533-LEACH-NG	682657.9700	1686284.0656
158	682855.6590	1686783.4130	4095.46	OT-C533-LEACH-NG	682657.7530	1686294.5476
159	682855.5230	1686790.0690	4095.47	OT-C533-LEACH-NG	682657.6171	1686301.2017
160	682857.2270	1686794.8730	4095.42	OT-C533-LEACH-NG	682659.3206	1686306.0043
161	682858.6900	1686813.7880	4095.55	OT-C533-LEACH-NG	682660.7832	1686324.9138
162	682867.9360	1686816.7350	4095.32	OT-C533-LEACH-NG	682670.0265	1686327.8599
163	682880.0660	1686814.6740	4095.00	OT-C533-LEACH-NG	682682.1530	1686325.7995
164	682891.9700	1686818.7840	4094.82	OT-C533-LEACH-NG	682694.0535	1686329.9083
165	682901.1340	1686806.7570	4094.86	OT-C533-LEACH-NG	682703.2148	1686317.8848
166	682889.7110	1686785.0140	4094.98	OT-C533-LEACH-NG	682691.7952	1686296.1481
167	682889.3190	1686757.8750	4094.96	OT-C533-LEACH-NG	682691.4033	1686269.0170
168	682886.6550	1686745.7080	4094.83	OT-C533-LEACH-NG	682688.7400	1686256.8535
169	682895.8900	1686814.7130	4095.19	OT-C533-FFLUEN-NG	682697.9724	1686325.8385
170	682901.8890	1686814.2530	4095.86	OT-C533-FFLUEN-TPAD	682703.9696	1686325.3787
171	682901.5970	1686811.8220	4095.84	OT-C533-SEPTIC-TCONC	682703.6777	1686322.9484
172	682911.5820	1686810.3750	4095.77	OT-C533-SEPTIC-TCONC	682713.6598	1686321.5018
173	682912.4280	1686815.4170	4095.77	OT-C533-SEPTIC-TCONC	682714.5056	1686326.5423
174	682902.3730	1686816.8390	4095.84	OT-C533-SEPTIC-TCONC	682704.4535	1686327.9639
175	682912.0910	1686812.7560	4095.77	OT-C533-EFLUEN-TCONC	682714.1687	1686323.8821
176	682923.3600	1686810.9450	4095.29	OT-C533-EFLUEN-NG	682725.4344	1686322.0716
177	682942.2940	1686810.3140	4095.49	OT-C533-EFLUEN-NG	682744.3629	1686321.4408
178	682937.5080	1686805.9000	4095.30	OT-C533-STATION1-NG	682739.5783	1686318.0278
179	682906.2780	1686808.8380	4094.86	OT-C533-STATION2-NG	682708.3574	1686319.9652
180	682895.2770	1686813.2080	4094.98	OT-C533-STATION3-NG	682697.3595	1686324.3340
181	700191.9570	1695605.3730	4181.72	OT-C540-STATION1-ASP	699989.0266	1695113.9508
182	700173.9260	1695611.2520	4181.82	OT-C540-STATION2-NG	699971.0008	1695119.8281
183	700168.8930	1695604.5390	4181.39	OT-C540-STATION3-NG	699965.9693	1695113.1170
184	700151.2700	1695598.6630	4180.49	OT-C540-STATION4-NG	699948.3514	1695107.2427
185	700158.9630	1695593.9090	4180.86	OT-C540-LEACH-NG	699956.0422	1695102.4901
186	700150.2560	1695603.0840	4180.78	OT-C540-LEACH-NG	699947.3377	1695111.6625
187	700152.8330	1695609.6400	4180.81	OT-C540-LEACH-NG	699949.9139	1695118.2166
188	700155.1660	1695611.7200	4180.89	OT-C540-LEACH-NG	699952.2463	1695120.2960
189	700161.1020	1695611.3470	4181.11	OT-C540-LEACH-NG	699958.1805	1695119.9231
190	700163.7200	1695601.1600	4181.06	OT-C540-LEACH-NG	699960.7978	1695109.7390
191	700161.5790	1695596.1920	4181.05	OT-C540-LEACH-NG	699958.6574	1695104.7725
192	700165.7400	1695603.7570	4181.48	OT-C540-FFLUEN-NG	699962.8172	1695112.3353
193	700170.8520	1695608.8530	4181.93	OT-C540-FFLUEN-NG	699967.9277	1695117.4298
194	700170.7290	1695606.7600	4182.01	OT-C540-SEPTIC-NG	699967.8048	1695115.3374
195	700176.8760	1695605.4490	4181.91	OT-C540-SEPTIC-NG	699973.9500	1695114.0268
196	700177.5910	1695612.4300	4181.92	OT-C540-SEPTIC-NG	699974.6648	1695121.0058
197	700172.1930	1695613.9030	4182.05	OT-C540-SEPTIC-NG	699969.2683	1695122.4783
198	700177.7030	1695608.9790	4181.69	OT-C540-EFLUEN-NG	699974.7767	1695117.5558
199	700205.8220	1695608.1850	4181.85	OT-C540-EFLUEN-ASPH	700002.8876	1695116.7620
200	700246.4300	1695613.4690	4182.95	OT-C540-EFLUEN-ASPH	700043.4838	1695122.0445
201	700238.4930	1695614.0360	4182.51	OT-C540-BLDGCOR	700035.5491	1695122.6113
202	700228.4390	1695608.1640	4182.55	OT-C540-BLDGCOR	700025.4980	1695116.7410
203	700227.0510	1695568.0300	4182.87	OT-C540-BLDGCOR	700024.1104	1695076.6186
204	700236.9380	1695557.6950	4183.02	OT-C540-BLDGCOR	700033.9946	1695066.2866
205	688305.7410	1690609.5510	4126.46	TU\US-C507-STATION1-	688106.2555	1690119.5767
206	688309.7220	1690614.0760	4126.51	TU\US-C507-STATION2-	688110.2353	1690124.1004
207	688306.7130	1690619.4150	4126.45	TU\US-C507-STATION3-	688107.2272	1690129.4378
208	688313.7000	1690621.8280	4126.37	TU\US-C507-STATION4-	688114.2122	1690131.8501
209	688313.7950	1690607.6410	4126.36	TU\US-C507-STATION5-	688114.3071	1690117.6673
210	688304.0140	1690620.9730	4126.47	TU\US-C507-USTPIT-AS	688104.5290	1690130.9954
211	688304.3040	1690607.3010	4126.54	TU\US-C507-USTPIT-AS	688104.8189	1690117.3274
212	688317.4320	1690607.1780	4126.54	TU\US-C507-USTPIT-AS	688117.9431	1690117.2044
213	688317.6000	1690622.2860	4126.57	TU\US-C507-USTPIT-AS	688118.1110	1690132.3080
214	688320.7590	1690623.9670	4127.18	TU\US-C507-BLDGCOR	688121.2691	1690133.9885
215	688330.7630	1690627.7570	4125.65	TU\US-C507-BLDGCOR	688131.2702	1690137.7774
216	688318.5520	1690598.7120	4126.71	TU\US-C507-BLDGCOR	688119.0628	1690108.7408
217	688306.5580	1690598.9520	4126.69	TU\US-C507-BLDGCOR	688107.0722	1690108.9808
218	688287.5740	1690592.3200	4126.83	TU\US-C507-EXMW1	688088.0937	1690102.3507
219	688287.4600	1690625.9270	4126.36	TU\US-C507-EXMW2	688087.9798	1690135.9480
220	689216.8690	1680453.8850	4087.76	TU\US-C501-STATION4-	689017.1194	1679966.8540
221	689203.4000	1680450.4300	4087.80	TU\US-C501-STATION1-	689003.6543	1679963.4000
222	689227.9170	1680449.2880	4087.78	TU\US-C501-STATION2-	689028.1642	1679962.2584

RAW DATA

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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
223	689201.2820	1680437.6020	4087.96	TU\US-C501-STATION3-	689001.5369	1679950.5757
224	689204.0090	1680426.7550	4087.80	TU\US-C501-STATION5-	689004.2631	1679939.7319
225	689200.5240	1680440.6650	4087.95	TU\US-C501-BLDGCOR-N	689000.7792	1679953.6379
226	689191.1430	1680432.8740	4088.07	TU\US-C501-BLDGCOR-N	688991.4009	1679945.8491
227	689202.0960	1680449.8730	4087.79	TU\US-C501-TANKPIT-N	689002.3507	1679962.8432
228	689201.5860	1680440.8210	4087.99	TU\US-C501-TANKPIT-N	689001.8408	1679953.7938
229	689191.7450	1680432.9310	4088.07	TU\US-C501-TANKPIT-N	688992.0027	1679945.9061
230	689195.4710	1680423.1750	4087.88	TU\US-C501-TANKPIT-N	688995.7276	1679936.1529
231	689207.1960	1680422.4490	4087.92	TU\US-C501-TANKPIT-N	689007.4492	1679935.4271
232	689229.2900	1680431.3210	4087.77	TU\US-C501-TANKPIT-N	689029.5368	1679944.2966
233	689231.6150	1680444.1310	4087.67	TU\US-C501-TANKPIT-N	689031.8611	1679957.1029
234	689227.5450	1680454.7320	4087.83	TU\US-C501-TANKPIT-N	689027.7923	1679967.7008
235	689218.0540	1680463.3780	4088.03	TU\US-C501-TANKPIT-N	689018.3041	1679976.3443
236	689209.0460	1680458.6260	4087.92	TU\US-C501-TANKPIT-N	689009.2987	1679971.5937
237	689237.1630	1680445.1670	4087.64	TU\US-C501-COMMLINE-	689037.4075	1679958.1386
238	689219.6050	1680436.9770	4088.00	TU\US-C501-COMMLINE-	689019.8546	1679949.9509
239	689199.7540	1680431.6770	4088.06	TU\US-C501-COMMLINE-	689000.0094	1679944.6525
240	689181.3550	1680425.0490	4088.20	TU\US-C501-COMMLINE-	688981.6157	1679938.0264
241	689162.6180	1680417.3900	4088.35	TU\US-C501-COMMLINE-	688962.8841	1679930.3696
242	689161.5970	1680417.5650	4088.56	TU\US-C501-COMMVAULT	688961.8634	1679930.5446
243	689157.8580	1680421.3400	4088.11	TU\US-C501-COMMVAULT	688958.1255	1679934.3185
244	689150.8680	1680414.5760	4088.10	TU\US-C501-COMMVAULT	688951.1375	1679927.5564
245	689154.6050	1680410.8830	4088.46	TU\US-C501-COMMVAULT	688954.8735	1679923.8645
246	687246.6430	1686873.0010	4105.82	OT-C535-STATION1-NG	687047.4644	1686384.1096
247	687270.5400	1686861.6690	4105.63	OT-C535-STATION2-NG	687071.3545	1686372.7809
248	687282.8340	1686866.7860	4105.85	OT-C535-STATION3-NG	687083.6449	1686377.8964
249	687303.5940	1686788.5490	4105.12	OT-C535-STATION4-NG	687104.3989	1686299.6821
250	687291.9640	1686793.7970	4105.27	OT-C535-LEACH-NG	687092.7723	1686304.9286
251	687304.7930	1686782.8770	4105.17	OT-C535-LEACH-NG	687105.5976	1686294.0117
252	687323.6740	1686798.1880	4105.34	OT-C535-LEACH-NG	687124.4731	1686309.3183
253	687319.7080	1686817.5380	4105.82	OT-C535-LEACH-NG	687120.5083	1686328.6627
254	687307.4400	1686838.9610	4105.76	OT-C535-LEACH-NG	687108.2438	1686350.0795
255	687297.0830	1686856.5380	4106.04	OT-C535-LEACH-NG	687097.8898	1686367.6514
256	687290.0540	1686837.9200	4105.59	OT-C535-LEACH-NG	687090.8628	1686349.0388
257	687291.3760	1686806.0200	4105.33	OT-C535-LEACH-NG	687092.1845	1686317.1480
258	687284.5890	1686864.5150	4106.11	OT-C535-FFLUEN-NG	687085.3994	1686375.6261
259	687276.8290	1686868.4490	4106.19	OT-C535-FFLUEN-NG	687077.6417	1686379.5589
260	687276.0820	1686870.8490	4106.28	OT-C535-SEPTIC-NG	687076.8949	1686381.9583
261	687263.3720	1686869.7190	4105.87	OT-C535-SEPTIC-NG	687064.1886	1686380.8286
262	687263.7200	1686863.5770	4105.95	OT-C535-SEPTIC-NG	687064.5365	1686374.6884
263	687276.4840	1686862.8870	4106.07	OT-C535-SEPTIC-NG	687077.2968	1686373.9986
264	687263.5270	1686868.1150	4105.92	OT-C535-EFLUEN-NG	687064.3435	1686379.2250
265	687228.9570	1686874.1570	4105.71	OT-C535-EFLUEN-NG	687029.7836	1686385.2653
266	687235.2230	1686881.4610	4106.05	OT-C535-BLDGCOR-NG	687036.0477	1686392.5672
267	687225.9150	1686892.3360	4105.90	OT-C535-BLDGCOR-NG	687026.7424	1686403.4390
268	687232.0250	1686844.5370	4105.92	OT-C535-BLDGCOR-NG	687032.8507	1686355.6539
269	687221.4890	1686835.3400	4105.63	OT-C535-BLDGCOR-NG	687022.3177	1686346.4595
270	677637.2460	1692755.6660	4110.24	TU/US-C505-MW1-CASIN	677440.8524	1692265.0697
271	677636.9990	1692755.6590	4109.84	TU/US-C505-MW1-PVC	677440.6055	1692265.0627
272	677634.4160	1692722.3930	4110.42	TU/US-C505-WELLATEMP	677438.0233	1692231.8064
273	677659.4620	1692742.2400	4110.34	TU/US-C505-WELLATEMP	677463.0620	1692251.6476
274	677701.9500	1692799.3200	4110.17	TU/US-C505-USTPIT-NG	677505.5377	1692308.7111
275	677701.3830	1692789.3010	4110.35	TU/US-C505-USTPIT-NG	677504.9708	1692298.6950
276	677711.5570	1692789.5280	4110.64	TU/US-C505-USTPIT-NG	677515.1419	1692298.9219
277	677710.8940	1692799.1130	4110.24	TU/US-C505-USTPIT-NG	677514.4791	1692308.5041
278	677707.4060	1692790.0820	4110.35	TU/US-C505-STATION1-	677510.9921	1692299.4757
279	677702.3100	1692795.0710	4110.20	TU/US-C505-STATION2-	677505.8976	1692304.4633
280	677705.6610	1692797.9500	4110.13	TU/US-C505-STATION3-	677509.2476	1692307.3415
281	677710.4770	1692793.8740	4110.09	TU/US-C505-STATION4-	677514.0622	1692303.2666
282	677706.4200	1692793.8350	4110.12	TU/US-C505-STATION5-	677510.0064	1692303.2276
283	677694.5060	1692779.7220	4110.88	TU/US-C505-BLDGCOR-N	677498.0958	1692289.1187
284	677704.1940	1692790.4680	4110.28	TU/US-C505-BLDGCOR-N	677507.7810	1692299.8616
285	677754.5670	1692783.0890	4110.79	TU/US-C505-BLDGCOR-N	677558.1394	1692292.4848
286	677743.8570	1692795.1680	4110.70	TU/US-C505-BLDGCOR-N	677547.4325	1692304.5603
287	686300.2320	1672933.0350	4060.98	OT-C542-MW-CASING-	686101.3277	1672448.1837
288	686300.2350	1672933.0550	4060.98	OT-C542-MW-PVC	686101.3307	1672448.2037
289	686274.4020	1672914.6520	4061.01	OT-C542-LEACH-NG	686075.5052	1672429.8061
290	686289.6710	1672938.5250	4060.76	OT-C542-LEACH-NG	686090.7698	1672453.6721
291	686294.6900	1672941.1720	4060.83	OT-C542-LEACH-NG	686095.7873	1672456.3184
292	686301.6970	1672938.9490	4060.85	OT-C542-LEACH-NG	686102.7923	1672454.0960
293	686305.7170	1672936.2850	4060.87	OT-C542-LEACH-NG	686106.8111	1672451.4328

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
294	686308.0670	1672931.0550	4060.89	OT-C542-LEACH-NG	686109.1604	1672446.2043
295	686304.8000	1672917.9090	4060.82	OT-C542-LEACH-NG	686105.8944	1672433.0621
296	686292.3740	1672901.2590	4060.90	OT-C542-LEACH-NG	686093.4720	1672416.4169
297	686283.4190	1672906.7050	4060.97	OT-C542-FFLUEN-NG	686084.5196	1672421.8614
298	686280.3770	1672902.6520	4060.94	OT-C542-FFLUEN-NG	686081.4785	1672417.8095
299	686276.9070	1672904.6420	4060.95	OT-C542-SEPTIC-NG	686078.0095	1672419.7990
300	686271.2980	1672896.9550	4060.80	OT-C542-SEPTIC-NG	686072.4021	1672412.1142
301	686281.9530	1672889.9350	4060.83	OT-C542-SEPTIC-NG	686083.0540	1672405.0962
302	686287.0950	1672896.6800	4060.88	OT-C542-SEPTIC-NG	686088.1945	1672411.8393
303	686285.7900	1672894.7150	4060.83	OT-C542-EFLUEN-NG	686086.8899	1672409.8748
304	686299.2270	1672887.1560	4060.87	OT-C542-EFLUEN-NG	686100.3230	1672402.3180
305	686310.9860	1672881.5880	4061.18	OT-C542-EFLUEN-NG	686112.0786	1672396.7516
306	686294.2970	1672858.0380	4060.90	OT-C542-BLDGCOR-NG	686095.3944	1672373.2085
307	686295.8820	1672844.1310	4061.28	OT-C542-BLDGCOR-NG	686096.9790	1672359.3055
308	686345.1390	1672922.4560	4060.89	OT-C542-BLDGCOR-NG	686146.2217	1672437.6078
309	686358.9780	1672924.0940	4061.42	OT-C542-BLDGCOR-NG	686160.0567	1672439.2453
310	686291.8860	1672885.1500	4060.65	OT-C542-STATION1-NG	686092.9841	1672400.3126
311	686275.2730	1672891.5340	4060.63	OT-C542-STATION2-NG	686076.3760	1672406.6948
312	686281.5390	1672904.6340	4060.73	OT-C542-STATION2-NG	686082.6401	1672419.7910
313	685750.1690	1671530.2910	4055.60	OT-C543-STATION2-NG	685551.4241	1671045.8463
314	685734.0730	1671548.8090	4055.84	OT-C543-STATION2	685535.3328	1671064.3589
315	685727.7350	1671514.3350	4055.33	OT-C543-STATION3	685528.9966	1671029.8949
316	685749.4390	1671546.6740	4055.91	OT-C543-EXSEPTIC	685550.6944	1671062.2245
317	685732.6430	1671545.5190	4055.74	OT-C543-EXSEPTIC	685533.9032	1671061.0699
318	685741.2600	1671557.0720	4056.32	OT-C543-EXSEPTIC	685542.5177	1671072.6195
319	685738.1510	1671537.7290	4055.62	OT-C543-EXSEPTIC	685539.4096	1671053.2821
320	685734.3520	1671541.2760	4055.65	OT-C543-FFLUEN	685535.6117	1671056.8281
321	685716.0920	1671515.5090	4055.04	OT-C543-FFLUEN	685517.3570	1671031.0686
322	685708.2650	1671520.5800	4055.23	OT-C543-LEACH	685509.5323	1671036.1381
323	685688.3040	1671512.0560	4055.52	OT-C543-LEACH	685489.5771	1671027.6166
324	685669.5610	1671502.3840	4055.36	OT-C543-LEACH	685470.8395	1671017.9474
325	685659.9210	1671495.2130	4055.04	OT-C543-LEACH	685461.2023	1671010.7784
326	685670.4020	1671495.5660	4055.43	OT-C543-MW-CASING	685471.6803	1671011.1313
327	685670.1370	1671495.6580	4055.13	OT-C543-MW-PVC	685471.4153	1671011.2233
328	685682.2550	1671485.7460	4055.16	OT-C543-LEACH	685483.5298	1671001.3142
329	685699.8070	1671491.2750	4054.76	OT-C543-LEACH	685501.0767	1671006.8416
330	685710.4840	1671499.0550	4055.06	OT-C543-LEACH	685511.7506	1671014.6193
331	685721.5030	1671508.4730	4055.40	OT-C543-LEACH	685522.7664	1671024.0346
332	685794.8190	1671498.3320	4056.84	OT-C543-EFLUEN	685596.0612	1671013.8965
333	685809.3600	1671495.0820	4059.27	OT-C543-BLDGCOR	685610.5980	1671010.6475
334	685776.9050	1671465.9090	4060.02	OT-C543-BLDGCOR	685578.1524	1670981.4829
335	685785.4230	1671455.8900	4060.26	OT-C543-BLDGCOR	685586.6679	1670971.4668
336	685744.8400	1671542.1950	4055.76	OT-C543-EFLUEN	685546.0967	1671057.7468
337	685303.6520	1671072.3550	4048.79	OT-C544-MW-CASING	685105.0365	1670588.0430
338	685303.3550	1671072.2840	4048.52	OT-C544-MW-PVC	685104.7396	1670587.9720
339	685349.4970	1671083.9730	4052.43	OT-C544-STATION1	685150.8683	1670599.6576
340	685342.4960	1671086.5980	4051.55	OT-C544-STATION1	685143.8693	1670602.2819
341	685336.0530	1671085.0120	4050.99	OT-C544-STATION1	685137.4282	1670600.6963
342	685336.7000	1671089.5480	4051.15	OT-C544-SEPTIC	685138.0750	1670605.2310
343	685338.4520	1671075.7050	4051.30	OT-C544-SEPTIC	685139.8265	1670591.3920
344	685347.8050	1671077.3720	4052.23	OT-C544-SEPTIC	685149.1768	1670593.0585
345	685345.6600	1671089.9410	4052.38	OT-C544-SEPTIC	685147.0324	1670605.6239
346	685356.1020	1671079.9660	4041.22	OT-C544-EFLUEN	685157.4713	1670595.6518
347	685347.2700	1671081.8770	4052.36	OT-C544-EFLUEN	685148.6419	1670597.5622
348	685337.4940	1671082.4320	4051.31	OT-C544-FFLUEN	685138.8687	1670598.1171
349	685335.1290	1671082.2690	4051.14	OT-C544-FFLUEN	685136.5044	1670597.9541
350	685336.2280	1671075.8560	4050.85	OT-C544-LEACH	685137.6031	1670591.5430
351	685323.3310	1671071.0830	4049.91	OT-C544-LEACH	685124.7098	1670586.7714
352	685297.8990	1671068.1360	4048.16	OT-C544-LEACH	685099.2852	1670583.8252
353	685296.9990	1671078.2660	4047.94	OT-C544-LEACH	685098.3855	1670593.9523
354	685317.0900	1671090.9580	4049.62	OT-C544-LEACH	685118.4707	1670606.6406
355	685334.6940	1671090.0750	4050.81	OT-C544-LEACH	685136.0696	1670605.7579
356	685360.4020	1671127.4140	4053.89	OT-C544-BLDGCOR	685161.7701	1670643.0860
357	685349.8450	1671114.5020	4052.32	OT-C544-BLDGCOR	685151.2162	1670630.1778
358	685360.3480	1671033.1240	4052.96	OT-C544-BLDGCOR	685161.7161	1670548.8234
359	685371.1230	1671022.2010	4053.70	OT-C544-BLDGCOR	685172.4880	1670537.9035
360	669828.5970	1693339.1960	4077.44	TU/US-C503-STATION1	669634.4665	1692848.4306
361	669823.8520	1693340.4930	4077.30	TU/US-C503-STATION2	669629.7229	1692849.7272
362	669816.1660	1693331.0930	4077.32	TU/US-C503-STATION3	669622.0391	1692840.3299
363	669804.9830	1693324.1990	4077.14	TU/US-C503-STATION5	669610.8594	1692833.4379
364	669830.2120	1693344.6950	4077.63	TU/US-C503-STATION4	669636.0811	1692853.9280

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
365	669820.3680	1693343.5050	4078.10	TU/US-C503-USTTANK	669626.2399	1692852.7383
366	669826.9160	1693337.2450	4077.78	TU/US-C503-USTTANK	669632.7860	1692846.4802
367	669831.7020	1693342.9300	4077.73	TU/US-C503-USTTANK	669637.5706	1692852.1635
368	669817.5060	1693300.2710	4077.28	TU/US-C503-BLDGCOR	669623.3788	1692809.5169
369	669817.0280	1693314.4610	4077.69	TU/US-C503-BLDGCOR	669622.9009	1692823.7028
370	669870.4630	1693326.6030	4077.24	TU/US-C503-BLDGCOR	669676.3204	1692835.8412
371	669857.6770	1693326.9550	4077.12	TU/US-C503-BLDGCOR	669663.5381	1692836.1931
372	669799.9830	1693280.8270	4076.53	TU/US-C503-BLDGCOR	669605.8608	1692790.0785
373	669786.0040	1693280.0690	4077.00	TU/US-C503-BLDGCOR	669591.8859	1692789.3207
374	669753.1970	1693299.5360	4076.55	TU/US-C503-MW1-CASIN	669559.0884	1692808.7821
375	669753.0160	1693299.6510	4076.22	TU/US-C503-MW1-PVC	669558.9075	1692808.8971
376	669717.9520	1693348.6000	4074.92	TU/US-C503-MW3-PVC	669523.8536	1692857.8319
377	669718.0930	1693348.2730	4075.65	TU/US-C503-MW3-CASIN	669523.9946	1692857.5050
378	669746.8950	1693329.2100	4076.92	TU/US-C503-BLDGCOR	669552.7882	1692838.4475
379	669747.5820	1693308.1150	4076.21	TU/US-C503-BLDGCOR	669553.4750	1692817.3586
380	669906.5180	1693361.1640	4077.43	TU/US-C503-MW2-CASIN	669712.3650	1692870.3922
381	669906.2520	1693361.2650	4077.07	TU/US-C503-MW2-PVC	669712.0990	1692870.4932
382	669887.0390	1693344.8910	4077.53	TU/US-C503-BLDGCOR	669692.8916	1692854.1239
383	669886.0230	1693359.0930	4077.99	TU/US-C503-BLDGCOR	669691.8759	1692868.3218
384	670862.3470	1691695.2520	4072.78	TU/US-C500-MW1-CASIN	670667.9169	1691204.9630
385	670862.1340	1691695.4850	4072.39	TU/US-C500-MW1-PVC	670667.7040	1691205.1960
386	670897.1420	1691671.0590	4072.25	TU/US-C500-MW2-PVC	670702.7019	1691180.7771
387	670897.3420	1691670.8340	4072.66	TU/US-C500-MW2-CASIN	670702.9018	1691180.5521
388	670997.2710	1691721.0890	4072.90	TU/US-C500-MW3-CASIN	670802.8018	1691230.7926
389	670996.9840	1691721.2540	4072.41	TU/US-C500-MW3-PVC	670802.5149	1691230.9575
390	670952.1640	1691699.4910	4072.04	TU/US-C500-STATION1	670757.7079	1691209.2008
391	670948.0960	1691682.1740	4072.36	TU/US-C500-STATION4	670753.6411	1691191.8888
392	670936.4590	1691683.8290	4072.05	TU/US-C500-STATION5	670742.0075	1691193.5434
393	670929.6330	1691690.0950	4072.11	TU/US-C500-STATION2	670735.1834	1691199.8075
394	670923.0530	1691673.0510	4072.18	TU/US-C500-STATION3	670728.6054	1691182.7685
395	670946.5050	1691708.7370	4072.40	TU/US-C500-USTPIT	670752.0506	1691218.4441
396	670961.7540	1691693.8260	4072.62	TU/US-C500-USTPIT	670767.2951	1691203.5375
397	670931.1680	1691662.3970	4072.93	TU/US-C500-USTPIT	670736.7180	1691172.1176
398	670915.4940	1691676.4560	4072.43	TU/US-C500-USTPIT	670721.0485	1691186.1725
399	670921.7940	1691667.6910	4072.61	TU/US-C500-BLDGCOR	670727.3467	1691177.4100
400	670938.3020	1691685.3670	4072.19	TU/US-C500-BLDGCOR	670743.8499	1691195.0809
401	670954.8550	1691686.5260	4072.52	TU/US-C500-BLDGCOR	670760.3981	1691196.2396
402	670964.2580	1691691.8600	4072.50	TU/US-C500-BLDGCOR	670769.7984	1691201.5720
403	670981.1410	1691692.8760	4072.84	TU/US-C500-BLDGCOR	670786.6765	1691202.5877
404	681138.2190	1690535.4430	4109.80	OT-C538-MW1-CASING	680940.8108	1690045.4902
405	681137.9660	1690535.5040	4109.43	OT-C538-MW1-PVC	680940.5579	1690045.5512
406	681154.3000	1690506.8540	4109.64	OT-C538-STATION3	680956.8871	1690016.9095
407	681170.7650	1690504.3700	4110.30	OT-C538-STATION2	680973.3473	1690014.4262
408	681207.7160	1690542.9160	4110.07	OT-C538-STATION1	681010.2876	1690052.9610
409	681171.2020	1690513.1430	4110.35	OT-C538-SEPTIC	680973.7842	1690023.1966
410	681160.8350	1690514.8700	4110.22	OT-C538-SEPTIC	680963.4202	1690024.9231
411	681157.5830	1690502.2430	4109.87	OT-C538-SEPTIC	680960.1692	1690012.2998
412	681168.6240	1690500.8410	4110.30	OT-C538-SEPTIC	680971.2070	1690010.8982
413	681157.7430	1690507.8780	4109.92	OT-C538-FFLUEN	680960.3291	1690017.9332
414	681149.7900	1690513.8560	4109.82	OT-C538-FFLUEN	680952.3784	1690023.9094
415	681146.2870	1690511.1610	4109.76	OT-C538-LEACH	680948.8764	1690021.2152
416	681140.0690	1690516.2140	4109.76	OT-C538-LEACH	680942.6602	1690026.2667
417	681131.8360	1690535.6580	4109.59	OT-C538-LEACH	680934.4296	1690045.7051
418	681142.3480	1690541.6090	4109.45	OT-C538-LEACH	680944.9386	1690051.6544
419	681148.4850	1690524.6340	4109.80	OT-C538-LEACH	680951.0738	1690034.6843
420	681152.9240	1690518.6140	4110.01	OT-C538-LEACH	680955.5115	1690028.6661
421	681171.0630	1690513.0040	4110.32	OT-C538-EFLUEN	680973.6453	1690023.0577
422	681199.3120	1690534.6340	4109.92	OT-C538-EFLUEN	681001.8861	1690044.6814
423	681311.9210	1690619.8910	4111.94	OT-C538-EFLUEN	681114.4624	1690129.9137
424	681378.0600	1690614.8720	4112.52	OT-C538-EFLUEN	681180.5823	1690124.8962
425	681511.9950	1690621.0250	4112.35	OT-C538-EFLUEN-C/O	681314.4785	1690131.0474
426	681543.8210	1690614.3290	4112.13	OT-C538-EFLUEN-C/O	681346.2952	1690124.3533
427	681545.1500	1690624.0320	4110.59	OT-C538-EFLUEN	681347.6238	1690134.0535
428	681526.9290	1690617.7410	4112.19	OT-C538-BLDGCOR	681329.4081	1690127.7643
429	681516.5600	1690627.6780	4112.22	OT-C538-BLDGCOR	681319.0421	1690137.6984
430	681517.0030	1690674.6590	4112.55	OT-C538-BLDGCOR	681319.4850	1690184.6658
431	681526.9640	1690685.0850	4112.68	OT-C538-BLDGCOR	681329.4431	1690195.0888
432	681610.3380	1690617.1910	4112.15	OT-C538-BLDGCOR	681412.7929	1690127.2145
433	681620.0290	1690626.9090	4112.29	OT-C538-BLDGCOR	681422.4811	1690136.9297
434	681248.7970	1690511.7190	4110.11	OT-C537-STATION1	681051.3567	1690021.7731
435	681230.2540	1690505.9940	4109.96	OT-C537-STATION2	681032.8191	1690016.0497

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
436	681220.0430	1690509.7920	4110.12	OT-C537-STATION3	681022.6111	1690019.8466
437	681224.9030	1690501.6020	4109.95	OT-C537-SEPTICDRY	681027.4697	1690011.6590
438	681224.2220	1690518.0560	4110.28	OT-C537-SEPTICDRY	681026.7889	1690028.1082
439	681236.7540	1690518.9910	4110.31	OT-C537-SEPTICDRY	681039.3172	1690029.0429
440	681236.4080	1690501.8520	4110.13	OT-C537-SEPTICDRY	681038.9713	1690011.9089
441	681237.2180	1690508.8330	4110.12	OT-C537-INLINE	681039.7811	1690018.8879
442	681311.7430	1690515.4440	4111.03	OT-C537-INLINE	681114.2845	1690025.4970
443	670561.7210	1680587.5740	4050.10	TU/US-C506-MW2-CASIN	670367.3781	1680100.5043
444	670561.4170	1680587.6760	4049.68	TU/US-C506-MW2-PVC	670367.0742	1680100.6062
445	670504.3430	1680580.0920	4050.14	TU/US-C506-MW1-PVC	670310.0167	1680093.0244
446	670504.5340	1680580.0020	4050.56	TU/US-C506-MW1-CASIN	670310.2076	1680092.9345
447	670508.2600	1680580.6030	4050.26	TU/US-C506-USTTANK	670313.9326	1680093.5353
448	670507.1490	1680575.9500	4050.27	TU/US-C506-USTTANK	670312.8219	1680088.8836
449	670517.9280	1680578.9030	4050.27	TU/US-C506-USTTANK	670323.5978	1680091.8358
450	670517.4300	1680574.2280	4050.28	TU/US-C506-USTTANK	670323.0999	1680087.1621
451	670507.9350	1680578.1630	4050.18	TU/US-C506-STATION1	670313.6077	1680091.0960
452	670513.3690	1680579.8330	4050.20	TU/US-C506-STATION2	670319.0401	1680092.7655
453	670517.9640	1680576.4150	4050.25	TU/US-C506-STATION3	670323.6338	1680089.3485
454	670511.2330	1680575.3810	4050.12	TU/US-C506-STATION4	670316.9047	1680088.3148
455	670512.5770	1680577.6370	4050.16	TU/US-C506-STATION5	670318.2483	1680090.5702
456	670485.1820	1680557.6150	4050.53	TU/US-C506-EXMW1-CAS	670290.8613	1680070.5540
457	670484.8980	1680557.6790	4050.38	TU/US-C506-EXMW1-PVC	670290.5773	1680070.6179
458	670494.8180	1680553.5430	4050.36	TU/US-C506-BLDGCOR	670300.4945	1680066.4831
459	670506.7310	1680561.7710	4050.38	TU/US-C506-BLDGCOR	670312.4040	1680074.7088
460	670510.1770	1680607.5970	4050.36	TU/US-C506-BLDGCOR	670315.8490	1680120.5215
461	670507.2460	1680618.1900	4050.39	TU/US-C506-BLDGCOR	670312.9189	1680131.1114
462	672564.5350	1692766.5990	4084.67	OT-C530-STATION1	672369.6116	1692275.9995
463	672567.1650	1692774.7240	4084.79	OT-C530-STATION2	672372.2409	1692284.1222
464	672567.5210	1692771.2850	4084.93	OT-C530-ACTSEPTIC	672372.5967	1692280.6842
465	672572.0780	1692767.3740	4084.89	OT-C530-ACTSEPTIC	672377.1524	1692276.7743
466	672575.8660	1692771.9070	4084.91	OT-C530-ACTSEPTIC	672380.9393	1692281.3060
467	672571.4280	1692775.8290	4084.95	OT-C530-ACTSEPTIC	672376.5026	1692285.2269
468	672569.6900	1692769.3550	4084.91	OT-C530-INLINE	672374.7651	1692278.7547
469	672563.6000	1692772.1360	4084.83	OT-C530-MW-CASING	672368.6769	1692281.5349
470	672563.2920	1692772.2960	4084.49	OT-C530-MW-PVC	672368.3690	1692281.6949
471	672509.9810	1692700.4750	4085.41	OT-C530-INLINE	672315.0734	1692209.8947
472	672538.3940	1692677.7240	4085.37	OT-C530-BLDGCOR	672343.4782	1692187.1503
473	672538.9710	1692663.8680	4085.27	OT-C530-BLDGCOR	672344.0550	1692173.2983
474	672478.3960	1692731.8290	4085.45	OT-C530-BLDGCOR	672283.4976	1692241.2396
475	672485.2490	1692739.1720	4085.12	OT-C530-BLDGCOR	672290.3486	1692248.5805
476	685978.3640	1686617.0530	4101.95	OT-C534-STATION1	685779.5530	1686128.2358
477	685949.9370	1686623.2970	4101.80	OT-C534-STATION2	685751.1342	1686134.4780
478	686041.6810	1686591.0650	4102.58	OT-C534-BLDGCOR	685842.8517	1686102.2553
479	686050.4200	1686580.6970	4102.78	OT-C534-BLDGCOR	685851.5881	1686091.8903
480	686053.7100	1686616.8100	4102.90	OT-C534-BLDGCOR	685854.8772	1686127.9929
481	686043.1140	1686607.6280	4102.82	OT-C534-BLDGCOR	685844.2842	1686118.8135
482	670482.5190	1680558.2400	4050.60	TU/US-C506-MW3-CASIN	670288.1990	1680071.1788
483	670482.3210	1680558.1750	4050.11	TU/US-C506-MW3-PVC	670288.0011	1680071.1138
484	669451.6250	1685381.2210	4054.88	TU/US-C515-STATION1	669257.6038	1684892.7620
485	669456.5920	1685373.9060	4054.66	TU/US-C515-STATION2	669262.5694	1684885.4491
486	669447.7270	1685364.3830	4054.13	TU/US-C515-STATION3	669253.7069	1684875.9289
487	669442.7430	1685375.3260	4054.34	TU/US-C515-STATION4	669248.7244	1684886.8687
488	669450.0780	1685373.9310	4054.62	TU/US-C515-STATION5	669256.0572	1684885.4741
489	669529.8630	1685390.3120	4053.57	TU/US-C515-MW3-PVC	669335.8191	1684901.8503
490	669530.0710	1685390.1630	4053.84	TU/US-C515-MW3-CASIN	669336.0271	1684901.7014
491	669347.3380	1685357.3580	4053.37	TU/US-C515-MW2-CASIN	669153.3470	1684868.9059
492	669347.0390	1685357.4240	4052.93	TU/US-C515-MW2-PVC	669153.0481	1684868.9719
493	669367.7310	1685396.1250	4053.43	TU/US-C515-MW1-PVC	669173.7341	1684907.6617
494	669368.0180	1685396.0880	4053.86	TU/US-C515-MW1-CASIN	669174.0210	1684907.6247
495	669413.7390	1685386.4140	4054.97	TU/US-C515-BLDGCOR	669219.7288	1684897.9535
496	669405.0760	1685397.5400	4056.39	TU/US-C515-BLDGCOR	669211.0683	1684909.0762
497	669442.6490	1685383.8010	4054.90	TU/US-C515-TANKPIT	669248.6304	1684895.3412
498	669458.4310	1685381.6630	4055.08	TU/US-C515-TANKPIT	669264.4078	1684893.2039
499	669454.7400	1685363.6010	4054.47	TU/US-C515-TANKPIT	669260.7179	1684875.1471
500	669440.8050	1685364.3540	4054.07	TU/US-C515-TANKPIT	669246.7869	1684875.8999
501	669474.3460	1685377.9770	4054.82	TU/US-C515-BLDGCOR	669280.3182	1684889.5189
502	669485.4880	1685386.3880	4055.07	TU/US-C515-BLDGCOR	669291.4570	1684897.9275
503	669257.8420	1685415.0700	4053.20	TU/US-C513-STATION3	669063.8770	1684926.6012
504	669241.6200	1685431.8260	4053.43	TU/US-C513-STATION2	669047.6597	1684943.3523
505	669234.6840	1685421.2410	4053.75	TU/US-C513-STATION5	669040.7257	1684932.7704
506	669232.2550	1685409.8190	4053.42	TU/US-C513-STATION4	669038.2974	1684921.3517

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

Corrections

Point #515
TU/US-515-MW3 PVC

Point #518
TU/US-515-MW2

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
507	669220.1400	1685422.8010	4053.52	TU/US-C513-STATION1	669026.1859	1684934.3299
508	669222.4590	1685431.2530	4053.64	TU/US-C513-TANKPIT	669028.5042	1684942.7795
509	669219.3990	1685411.0450	4054.92	TU/US-C513-TANKPIT	669025.4451	1684922.5773
510	669260.7320	1685426.0370	4053.70	TU/US-C513-TANKPIT	669066.7661	1684937.5650
511	669277.6950	1685433.5720	4053.31	TU/US-C513-MW2-CASIN	669083.7242	1684945.0978
512	669243.5650	1685418.8110	4054.36	TU/US-C513-TRANSPAD	669049.6041	1684930.3411
513	669236.4970	1685419.8090	4054.30	TU/US-C513-TRANSPAD	669042.5381	1684931.3388
514	669235.5680	1685411.9050	4054.57	TU/US-C513-TRANSPAD	669041.6094	1684923.4371
515	669277.6850	1685433.6210	4053.26	TU/US-C513-MW2-C[illegible] PVC	669083.7142	1684945.1468 → MW3
516	669188.9570	1685441.5400	4053.76	TU/US-C513-MW1-CASIN	668995.0119	1684953.0635
517	669188.7180	1685441.6230	4053.31	TU/US-C513-MW1-PVC	668994.7730	1684953.1465
518	669175.0530	1685411.5360	4053.78	TU/US-C513-MW3-PVC	668981.1120	1684923.0682 → MW2
519	669175.2900	1685411.4450	4054.15	TU/US-C513-MW3-CASIN	668981.3489	1684922.9772
520	669194.6820	1685411.4540	4054.72	TU/US-C513-BLDGCOR	669000.7353	1684922.9862
521	669205.8290	1685420.1440	4054.47	TU/US-C513-BLDGCOR	669011.8790	1684931.6737
522	669292.6520	1685418.3920	4053.83	TU/US-C513-BLDGCOR	669098.6769	1684929.9222
523	669293.9380	1685428.2990	4053.77	TU/US-C513-BLDGCOR	669099.9625	1684939.8263
524	685879.9040	1686627.7590	4102.02	OTC-534-CASING	685681.1215	1686138.9387
525	685879.6290	1686627.7910	4101.61	OTC-534-PVC	685680.8466	1686138.9707
526	685894.0510	1686651.2940	4102.15	OTC-534-MW6-CASING	685695.2644	1686162.4669
527	685893.7240	1686651.3020	4101.74	OTC-534-MW6-PVC	685694.9375	1686162.4749
528	685866.3710	1686655.8860	4101.59	OTC-534-MW8-PVC	685667.5925	1686167.0576
529	685866.6060	1686655.6520	4102.06	OTC-534-MW8-CASING	685667.8274	1686166.8236
530	685876.1160	1686687.3140	4102.11	OTC-534-MW5-CASING	685677.3346	1686198.4764
531	685875.8760	1686687.4250	4101.81	OTC-534-MW5-PVC	685677.0947	1686198.5874
532	685834.9910	1686704.4610	4101.83	OTC-534-MW9-PVC	685636.2216	1686215.6185
533	685835.2820	1686704.5300	4102.15	OTC-534-MW9-CASING	685636.5125	1686215.6875
534	685772.4780	1686595.2240	4101.45	OTC-534-MW10-NG	685573.7267	1686106.4131
535	669081.1480	1678793.1860	4046.72	OTC-531B-SEPTANK	668887.2342	1678306.6363
536	669082.4390	1678801.3130	4046.63	OTC-531B-SEPTANK	668888.5248	1678314.7610
537	669072.3810	1678802.9790	4046.81	OTC-531B-SEPTANK	668878.4697	1678316.4265
538	669070.8860	1678795.3530	4046.82	OTC-531B-SEPTANK	668876.9751	1678308.8027
539	669104.1410	1678787.7690	4045.69	OTC-531B-STATION-1	668910.2205	1678301.2209
540	669070.9690	1678801.9800	4046.52	OTC-531B-STATION-2	668877.0581	1678315.4278
541	669061.4820	1678787.2510	4046.24	OTC-531B-STATION-3	668867.5739	1678300.7031
542	669022.2810	1678760.4940	4045.98	OTC-531B-MW-1-PVC	668828.3842	1678273.9538
543	669022.4740	1678760.4670	4046.35	OTC-531B-MW-1-CASING	668828.5772	1678273.9268
544	669029.7060	1678750.8610	4046.12	OTC-531B-LEACH	668835.8071	1678264.3236
545	669044.0770	1678753.3070	4046.04	OTC-531B-LEACH	668850.1739	1678266.7689
546	669048.2090	1678762.3910	4046.19	OTC-531B-LEACH	668854.3047	1678275.8503
547	669052.8600	1678773.5200	4046.17	OTC-531B-LEACH	668858.9544	1678286.9760
548	669051.8580	1678782.0380	4046.19	OTC-531B-LEACH	668857.9527	1678295.4916
549	669045.9680	1678791.0410	4045.97	OTC-531B-LEACH	668852.0644	1678304.4920
550	669037.6080	1678787.3270	4046.05	OTC-531B-LEACH	668843.7068	1678300.7790
551	669030.8940	1678787.9690	4046.07	OTC-531B-LEACH	668836.9947	1678301.4208
552	669024.6850	1678794.4050	4045.99	OTC-531B-LEACH	668830.7875	1678307.8550
553	669012.0060	1678808.0140	4045.98	OTC-531B-LEACH	668818.1122	1678321.4600
554	669005.0390	1678788.3970	4045.95	OTC-531B-LEACH	668811.1472	1678301.8487
555	669008.1540	1678771.5710	4046.05	OTC-531B-LEACH	668814.2613	1678285.0276
556	669012.3090	1678761.0960	4046.10	OTC-531B-LEACH	668818.4151	1678274.5556
557	669052.5660	1678784.6580	4046.08	OTC-531B-FLINE	668858.6605	1678298.1108
558	669071.4380	1678798.9230	4046.55	OTC-531B-FLINE	668877.5270	1678312.3717
559	669082.2160	1678797.7200	4046.58	OTC-531B-ELINE	668888.3019	1678311.1690
560	669109.7160	1678792.3340	4045.64	OTC-531B-ELINE	668915.7939	1678305.7846
561	669130.6340	1678787.5660	4047.05	OTC-531B-ELINE	668936.7058	1678301.0180
562	669132.6960	1678800.0880	4046.87	OTC-531B-BLDGCOR	668938.7672	1678313.5363
563	669139.6540	1678804.9540	4046.97	OTC-531B-BLDGCOR	668945.7232	1678318.4009
564	669127.3740	1678771.5760	4046.72	OTC-531B-BLDGCOR	668933.4468	1678285.0326
565	669131.8520	1678764.6150	4047.25	OTC-531B-BLDGCOR	668937.9235	1678278.0736
566	668593.1300	1678901.9680	4046.19	OTC-531C-BLDGCOR	668399.3576	1678415.3868
567	668588.1250	1678902.8360	4046.21	OTC-531C-BLDGCOR	668394.3541	1678416.2546
568	668585.3350	1678865.5840	4046.55	OTC-531C-BLDGCOR	668391.5649	1678379.0133
569	668590.1110	1678858.6070	4046.53	OTC-531C-BLDGCOR	668396.3395	1678372.0384
570	668590.3090	1678889.4560	4045.95	OTC-531C-ELINE	668396.5374	1678402.8784
571	668578.4210	1678891.4650	4046.03	OTC-531C-ELINE	668384.6529	1678404.8868
572	668560.7680	1678894.7530	4045.47	OTC-531C-ELINE	668367.0050	1678408.1739
573	668535.6480	1678899.2930	4046.35	OTC-531C-ELINE	668341.8923	1678412.7126
574	668535.0660	1678896.4960	4046.68	OTC-531C-SEPTIC	668341.3104	1678409.9164
575	668535.3940	1678905.9700	4046.47	OTC-531C-SEPTIC	668341.6383	1678419.3876
576	668522.2510	1678906.9450	4046.51	OTC-531C-SEPTIC	668328.4992	1678420.3624
577	668522.3100	1678897.4040	4046.39	OTC-531C-SEPTIC	668328.5581	1678410.8241

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
578	668561.9930	1678890.5660	4045.66	OTC-531C-STATION-1	668368.2296	1678403.9881
579	668531.2500	1678902.0810	4046.55	OTC-531C-STATION-2	668337.4955	1678415.4998
580	668522.9580	1678893.5110	4045.84	OTC-531C-STATION-3	668329.2059	1678406.9323
581	668521.6100	1678902.7660	4046.16	OTC-531C-FLINE	668327.8583	1678416.1846
582	668515.2610	1678901.5740	4045.66	OTC-531C-FLINE	668321.5112	1678414.9929
583	668515.8520	1678907.4010	4045.67	OTC-531C-LEACH	668322.1020	1678420.8182
584	668498.6960	1678906.8280	4045.81	OTC-531C-LEACH	668304.9510	1678420.2454
585	668489.9270	1678907.6430	4045.74	OTC-531C-LEACH	668296.1845	1678421.0602
586	668481.5760	1678902.8790	4045.69	OTC-531C-LEACH	668287.8359	1678416.2975
587	668476.1180	1678891.3230	4045.84	OTC-531C-LEACH	668282.3795	1678404.7449
588	668473.4290	1678883.0340	4045.68	OTC-531C-LEACH	668279.6913	1678396.4583
589	668473.7340	1678874.2510	4045.53	OTC-531C-LEACH	668279.9962	1678387.6778
590	668476.2360	1678867.2340	4045.54	OTC-531C-LEACH	668282.4975	1678380.6629
591	668482.1720	1678868.3950	4045.45	OTC-531C-MW-1-PVC	668288.4318	1678381.8235
592	668482.4510	1678868.3680	4045.85	OTC-531C-MW-1-CASING	668288.7107	1678381.7965
593	668490.9400	1678863.0190	4045.60	OTC-531C-LEACH	668297.1972	1678376.4491
594	668503.3450	1678866.8310	4045.87	OTC-531C-LEACH	668309.5986	1678380.2600
595	668508.4050	1678874.1920	4045.93	OTC-531C-LEACH	668314.6572	1678387.6189
596	668515.8970	1678879.7420	4045.82	OTC-531C-LEACH	668322.1470	1678393.1672
597	668524.3970	1678890.3500	4045.70	OTC-531C-LEACH	668330.6445	1678403.7722
598	667495.6300	1679128.7300	4042.53	OTC-532-BLDGCOR	667302.1757	1678642.0831
599	667488.6400	1679123.9580	4042.71	OTC-532-BLDGCOR	667295.1877	1678637.3125
600	667462.6660	1679059.4970	4041.10	OTC-532-BLDGCOR	667269.2212	1678572.8701
601	667481.1840	1679050.1710	4042.61	OTC-532-BLDGCOR	667287.7339	1678563.5469
602	667486.0130	1679106.7520	4042.73	OTC-532-ELINE	667292.5615	1678620.1115
603	667462.4800	1679111.5030	4040.38	OTC-532-ELINE	667269.0353	1678624.8611
604	667462.2250	1679114.4150	4040.62	OTC-532-STATION-1	667268.7804	1678627.7722
605	667442.0090	1679119.1410	4041.24	OTC-532-STATION-2	667248.5702	1678632.4969
606	667419.1640	1679115.1840	4040.86	OTC-532-STATION-3	667225.7319	1678628.5410
607	667385.6930	1679101.6040	4040.50	OTC-532-STATION-4	667192.2706	1678614.9649
608	667381.8850	1679101.5680	4040.62	OTC-532-LEACH	667188.4637	1678614.9290
609	667383.6400	1679091.6130	4040.63	OTC-532-LEACH	667190.2181	1678604.9768
610	667385.4250	1679087.0370	4040.57	OTC-532-LEACH	667192.0026	1678600.4022
611	667388.9960	1679084.4040	4040.65	OTC-532-LEACH	667195.5726	1678597.7699
612	667394.2390	1679084.6140	4040.73	OTC-532-LEACH	667200.8141	1678597.9799
613	667396.1210	1679092.7430	4040.70	OTC-532-LEACH	667202.6955	1678606.1065
614	667398.1240	1679100.9150	4040.70	OTC-532-LEACH	667204.6979	1678614.2761
615	667402.2360	1679106.9240	4040.75	OTC-532-LEACH	667208.8088	1678620.2834
616	667410.1270	1679109.8530	4040.82	OTC-532-LEACH	667216.6975	1678623.2116
617	667419.4540	1679110.1630	4040.85	OTC-532-LEACH	667226.0218	1678623.5215
618	667420.7270	1679120.1400	4041.02	OTC-532-FLINE	667227.2944	1678633.4956
619	667423.8510	1679141.7780	4040.59	OTC-532-LEACH	667230.4175	1678655.1273
620	667412.2990	1679143.4760	4040.74	OTC-532-LEACH	667218.8688	1678656.8248
621	667403.7350	1679143.1670	4040.80	OTC-532-LEACH	667210.3073	1678656.5159
622	667397.0900	1679139.6510	4040.75	OTC-532-LEACH	667203.6642	1678653.0009
623	667384.3300	1679127.9250	4040.44	OTC-532-LEACH	667190.9079	1678641.2783
624	667382.6070	1679116.1130	4040.44	OTC-532-LEACH	667189.1854	1678629.4697
625	667430.4810	1679118.6630	4041.32	OTC-532-FLINE	667237.0456	1678632.0190
626	667430.2210	1679114.2980	4041.25	OTC-532-SEPTIC	667236.7856	1678627.6553
627	667440.5880	1679113.0200	4041.26	OTC-532-SEPTIC	667247.1496	1678626.3776
628	667442.9470	1679123.3120	4041.21	OTC-532-SEPTIC	667249.5080	1678636.6667
629	667430.1210	1679125.8580	4041.28	OTC-532-SEPTIC	667236.6857	1678639.2119
630	667441.8110	1679116.2010	4041.27	OTC-532-ELINE	667248.3723	1678629.5577
631	669659.5140	1678688.1920	4048.05	OTC-531A-ELINE	669465.4326	1678201.6728
632	669645.1200	1678691.4170	4047.42	OTC-531A-ELINE	669451.0427	1678204.8968
633	669626.5240	1678694.6570	4048.54	OTC-531A-ELINE	669432.4521	1678208.1359
634	669625.4550	1678690.5680	4048.58	OTC-531A-SEPTIC	669431.3834	1678204.0481
635	669627.0130	1678697.2200	4048.59	OTC-531A-SEPTIC	669432.9410	1678210.6981
636	669614.1180	1678700.1730	4048.60	OTC-531A-SEPTIC	669420.0497	1678213.6503
637	669613.0940	1678693.8150	4048.72	OTC-531A-SEPTIC	669419.0260	1678207.2941
638	669648.5430	1678685.0250	4047.24	OTC-531A-STATION-1	669454.4647	1678198.5067
639	669615.3510	1678691.9600	4048.59	OTC-531A-STATION-2	669421.2823	1678205.4397
640	669607.0140	1678691.1700	4048.42	OTC-531A-STATION-3	669412.9478	1678204.6499
641	669606.7200	1678688.2040	4048.56	OTC-531A-LEACH	669412.6539	1678201.6848
642	669608.9270	1678706.1330	4048.28	OTC-531A-LEACH	669414.8602	1678219.6086
643	669601.3790	1678707.8980	4048.13	OTC-531A-LEACH	669407.3144	1678221.3730
644	669593.2420	1678708.2220	4047.49	OTC-531A-LEACH	669399.1798	1678221.6970
645	669578.1380	1678708.5010	4047.22	OTC-531A-LEACH	669384.0801	1678221.9759
646	669565.0490	1678706.1840	4047.29	OTC-531A-LEACH	669370.9949	1678219.6595
647	669554.2260	1678694.3690	4047.37	OTC-531A-LEACH	669360.1751	1678207.8480
648	669553.4160	1678687.6760	4047.59	OTC-531A-LEACH	669359.3653	1678201.1569

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
649	669552.5940	1678678.4030	4047.76	OTC-531A-LEACH	669358.5435	1678191.8866
650	669550.0120	1678656.4050	4047.76	OTC-531A-LEACH	669355.9623	1678169.8950
651	669556.1880	1678652.3190	4047.86	OTC-531A-LEACH	669362.1365	1678165.8102
652	669559.2580	1678655.8340	4047.38	OTC-531A-MW-1-PVC	669365.2056	1678169.3241
653	669559.5100	1678655.7600	4047.78	OTC-531A-MW-1-CASING	669365.4575	1678169.2502
654	669561.9190	1678650.8880	4047.69	OTC-531A-LEACH	669367.8658	1678164.3796
655	669569.0970	1678659.8040	4048.02	OTC-531A-LEACH	669375.0418	1678173.2930
656	669574.5390	1678669.0420	4047.77	OTC-531A-LEACH	669380.4822	1678182.5283
657	669580.0480	1678677.6210	4047.77	OTC-531A-LEACH	669385.9896	1678191.1048
658	669581.1180	1678685.2190	4047.72	OTC-531A-LEACH	669387.0593	1678198.7006
659	669589.3790	1678690.0080	4047.91	OTC-531A-LEACH	669395.3179	1678203.4882
660	669598.7410	1678687.4540	4047.88	OTC-531A-LEACH	669404.6772	1678200.9350
661	669608.6000	1678697.8630	4048.38	OTC-531A-FLINE	669414.5333	1678211.3410
662	669613.4950	1678697.0050	4048.61	OTC-531A-FLINE	669419.4269	1678210.4832
663	669434.7190	1685385.1220	4055.15	US/TC-515-EXAVATION	669240.7027	1684896.6618
664	669433.7320	1685375.0770	4054.68	US/TC-515-EXAVATION	669239.7160	1684886.6198
665	669453.6100	1685372.2880	4054.89	US/TC-515-EXAVATION	669259.5882	1684883.8316
666	669455.2490	1685382.6100	4055.08	US/TC-515-EXAVATION	669261.2268	1684894.1506
667	669423.1290	1685379.3360	4054.73	US/TC-515-POTHOLE-1	669229.1161	1684890.8775
668	669443.7270	1685362.1260	4054.20	US/TC-515-POTHOLE-2	669249.7081	1684873.6725
669	669443.2340	1685352.4030	4053.69	US/TC-515-POTHOLE-3	669249.2152	1684863.9523
670	669388.8600	1685382.9350	4054.36	US/TC-515-POTHOLE-4	669194.8570	1684894.4755
671	666075.3380	1693454.3920	4059.75	US/TC-502-TANK/EX	665882.2953	1692963.5932
672	666064.5480	1693454.6090	4059.59	US/TC-502-TANK/EX	665871.5084	1692963.8101
673	666064.5890	1693463.2320	4059.66	US/TC-502-TANK/EX	665871.5494	1692972.4306
674	666075.7420	1693463.6580	4059.85	US/TC-502-TANK/EX	665882.6992	1692972.8565
675	666070.2430	1693458.8620	4059.56	US/TC-502-STATION-1	665877.2018	1692968.0619
676	666075.3470	1693459.1030	4059.61	US/TC-502-STATION-2	665882.3043	1692968.3028
677	666070.4890	1693455.0470	4059.46	US/TC-502-STATION-3	665877.4477	1692964.2480
678	666070.2650	1693463.1340	4059.49	US/TC-502-STATION-4	665877.2238	1692972.3327
679	666072.2440	1693503.2780	4060.12	US/TC-502-FIREHY	665879.2022	1693012.4650
680	669813.9600	1693315.1950	4077.70	US/TC-503-EXAVATION	669619.8338	1692824.4365
681	669826.0790	1693326.7460	4077.45	US/TC-503-EXAVATION	669631.9493	1692835.9842
682	669815.4720	1693337.1950	4077.67	US/TC-503-EXAVATION	669621.3454	1692846.4302
683	669803.8000	1693324.4750	4077.59	US/TC-503-EXAVATION	669609.6767	1692833.7139
684	669818.2990	1693319.1730	4077.48	US/TC-503-BEGTRENCH	669624.1715	1692828.4134
685	669837.0790	1693303.2490	4076.88	US/TC-503-ENDTRENCH	669642.9461	1692812.4940
686	681138.0180	1690539.4590	4109.33	OTC-538-STATION-5	680940.6098	1690049.5050
687	673758.3950	1683356.5480	4060.55	US/TC-514-STATION-1	673563.1256	1682868.6758
688	673765.5540	1683358.1250	4060.47	US/TC-514-STATION-2	673570.2825	1682870.2523
689	673770.0890	1683350.4240	4060.48	US/TC-514-STATION-3	673574.8162	1682862.5535
690	673768.2490	1683354.2670	4060.48	US/TC-514-STATION-4	673572.9768	1682866.3954
691	673777.4280	1683353.4050	4060.71	US/TC-514-STATION-5	673582.1531	1682865.5337
692	673776.8350	1683359.0390	4060.94	US/TC-514-BLDGCOR	673581.5603	1682871.1661
693	673769.7480	1683353.9100	4060.70	US/TC-514-BLDGCOR	673574.4753	1682866.0385
694	673778.8570	1683370.4750	4060.92	US/TC-514-BLDGCOR	673583.5817	1682882.5987
695	673773.9440	1683377.3380	4060.70	US/TC-514-BLDGCOR	673578.6701	1682889.4597
696	673723.3370	1683411.0030	4060.56	US/TC-514-MW-1-PVC	673528.0778	1682923.1150
697	673723.6160	1683410.9000	4061.02	US/TC-514-MW-1-CASIN	673528.3567	1682923.0120
698	673699.2890	1683380.7720	4061.09	US/TC-514-MW-2-CASIN	673504.0367	1682892.8928
699	673698.9660	1683380.8260	4060.66	US/TC-514-MW-2-PVC	673503.7138	1682892.9467
700	673812.5550	1683317.4880	4060.43	US/TC-514-MW-3-PVC	673617.2699	1682829.6271
701	673812.8820	1683317.4350	4060.76	US/TC-514-MW-3-CASIN	673617.5968	1682829.5741
702	673776.7270	1683350.1350	4060.82	US/TC-514-FORM/TANK	673581.4523	1682862.2646
703	673777.3420	1683356.4370	4060.94	US/TC-514-FORM/TANK	673582.0671	1682868.5648
704	673759.1130	1683359.4810	4061.06	US/TC-514-FORM/TANK	673563.8434	1682871.6079
705	673757.7990	1683353.3170	4061.32	US/TC-514-FORM/TANK	673562.5298	1682865.4457
706	678061.9490	1684350.2580	4078.63	US/TC-516-FORMTANK	677865.4323	1683862.0978
707	678072.0100	1684348.4740	4078.61	US/TC-516-FORMTANK	677875.4904	1683860.3143
708	678074.0860	1684360.1530	4078.25	US/TC-516-FORMTANK	677877.5658	1683871.9899
709	678065.1290	1684362.4260	4078.47	US/TC-516-FORMTANK	677868.6114	1683874.2622
710	678069.6040	1684359.8850	4078.30	US/TC-516-STATION-1	677873.0851	1683871.7220
711	678064.5960	1684356.9350	4078.34	US/TC-516-STATION-2	677868.0786	1683868.7728
712	678066.1670	1684350.4200	4078.54	US/TC-516-STATION-3	677869.6491	1683862.2597
713	678072.9250	1684354.8490	4078.09	US/TC-516-STATION-4	677876.4052	1683866.6874
714	678101.7280	1684311.2380	4077.72	US/TC-516-MW-2	677905.1998	1683823.0891
715	678116.9250	1684291.3650	4077.78	US/TC-516-MW-2	677920.3924	1683803.2218
716	678061.7680	1684335.2520	4080.38	US/TC-516-BLDGCOR	677865.2514	1683847.0961
717	678064.6310	1684348.2080	4081.07	US/TC-516-BLDGCOR	677868.1136	1683860.0484
718	678026.7560	1684390.7900	4078.49	US/TC-516-MW-1	677830.2495	1683902.6180
719	678014.0050	1684363.8290	4077.81	US/TC-516-MW-3	677817.5022	1683875.6648

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
720	671269.9880	1692357.3370	4075.08	US/TC-508-FORM/TANK	671075.4398	1691866.8562
721	671299.4450	1692330.8640	4075.18	US/TC-508-FORM/TANK	671104.8883	1691840.3908
722	671324.3300	1692358.5130	4075.17	US/TC-508-FORM/TANK	671129.7661	1691868.0318
723	671294.8560	1692384.8580	4075.02	US/TC-508-FORM/TANK	671100.3006	1691894.3692
724	671311.5950	1692346.0080	4075.12	US/TC-508-STATION-2	671117.0347	1691855.5304
725	671302.2680	1692357.1830	4075.07	US/TC-508-STATION-1	671107.7104	1691866.7022
726	671312.4640	1692368.2800	4074.98	US/TC-508-STATION-4	671117.9035	1691877.7960
727	671282.5110	1692369.9060	4075.01	US/TC-508-STATION-3	671087.9592	1691879.4215
728	671289.2400	1692342.4620	4075.15	US/TC-508-STATION-5	671094.6862	1691851.9855
729	671373.3210	1692386.6060	4075.00	US/TC-508-MW-3-PVC	671178.7429	1691896.1167
730	671373.6120	1692386.5000	4075.33	US/TC-508-MW-3-CASIN	671179.0338	1691896.0107
731	671216.9160	1692488.1670	4075.54	US/TC-508-SS18-MW08-CASIN	671022.3832	1691997.6482
732	671216.7110	1692488.4340	4075.26	US/TC-508-SS18-MW08-PVC	671022.1782	1691997.9152
733	671236.3110	1692301.9320	4075.19	US/TC-508-MW-2-CASIN	671041.7726	1691811.4672
734	671236.1240	1692302.1450	4074.80	US/TC-508-MW-2-PVC	671041.5856	1691811.6801
735	671211.3090	1692324.4610	4075.35	US/TC-508-MW-1-CASIN	671016.7778	1691833.9897
736	671211.0360	1692324.6620	4074.93	US/TC-508-MW-1-PVC	671016.5049	1691834.1906
737	671174.1880	1692241.9700	4074.81	US/TC-508-SS18-MW16-PVC	670979.6676	1691751.5226
738	671174.4770	1692241.7880	4075.34	US/TC-508-SS18-MW16-CASIN	670979.9565	1691751.3406
739	671035.8870	1692106.1030	4074.42	US/TC-508-SS18-MW18-CASIN	670841.4066	1691615.6950
740	671035.6230	1692106.3690	4073.74	US/TC-508-SS18-MW18-PVC	670841.1427	1691615.9609
741	671043.1730	1692355.2630	4075.73	US/TC-508-SS18-MW19-PVC	670848.6905	1691864.7828
742	670383.2120	1691278.5670	4072.57	US/TC-504-MW-2-CASIN	670188.9208	1690788.3988
743	670383.0220	1691278.7790	4072.19	US/TC-504-MW-2-PVC	670188.7309	1690788.6107
744	670343.7050	1691297.2270	4072.57	US/TC-504-MW-1-PVC	670149.4253	1690807.0534
745	670343.9460	1691296.8630	4072.80	US/TC-504-MW-1-CASIN	670149.6662	1690806.6895
746	669680.3630	1678704.0610	4048.54	OTC-531A-BLDGCOR	669486.2755	1678217.5372
747	669673.4280	1678699.1340	4048.44	OTC-531A-BLDGCOR	669479.3425	1678212.6116
748	669662.1160	1678671.3190	4048.32	OTC-531A-BLDGCOR	669468.0338	1678184.8047
749	669671.0810	1678657.6480	4048.29	OTC-531A-BLDGCOR	669476.9962	1678171.1376
750	669671.6690	1678686.6260	4048.54	OTC-531A-ELINE	669477.5840	1678200.1072
751	670995.2900	1691723.6540	4072.55	US/TC-500-STATION-6	670800.8214	1691233.3568
752	682707.7150	1693994.3080	4139.12	OTC-539-SEPTIC	682509.8519	1693503.3527
753	682707.1360	1693987.5070	4139.01	OTC-539-SEPTIC	682509.2731	1693496.5537
754	682713.9270	1693987.3840	4139.07	OTC-539-SEPTIC	682516.0621	1693496.4307
755	682714.4020	1693993.8490	4139.12	OTC-539-SEPTIC	682516.5370	1693502.8939
756	682710.5050	1693994.2530	4139.11	OTC-539-ELINE	682512.6411	1693503.2977
757	682711.7750	1694038.3560	4139.83	OTC-539-ELINE	682513.9107	1693547.3880
758	682709.6340	1694009.1330	4139.38	OTC-539-STATION-1	682511.7704	1693518.1734
759	682715.9010	1693990.7160	4139.12	OTC-539-STATION-2	682518.0355	1693499.7618
760	682707.9950	1693985.7400	4139.05	OTC-539-STATION-3	682510.1318	1693494.7872
761	682690.1540	1693966.7430	4138.58	OTC-539-STATION-4	682492.2960	1693475.7957
762	682700.5510	1693984.6270	4139.10	OTC-539-LEACH	682502.6900	1693493.6745
763	682694.7220	1693978.9800	4138.75	OTC-539-LEACH	682496.8627	1693488.0292
764	682685.8570	1693975.5370	4138.62	OTC-539-LEACH	682488.0002	1693484.5872
765	682686.8260	1693963.6500	4138.56	OTC-539-LEACH	682488.9690	1693472.7036
766	682690.9260	1693959.9730	4138.78	OTC-539-LEACH	682493.0678	1693469.0277
767	682696.9840	1693956.9410	4138.94	OTC-539-LEACH	682499.1240	1693465.9966
768	682705.4410	1693958.5980	4139.12	OTC-539-LEACH	682507.5786	1693467.6531
769	682714.7430	1693968.3290	4139.32	OTC-539-LEACH	682516.8779	1693477.3813
770	682721.4010	1693976.8710	4139.30	OTC-539-LEACH	682523.5339	1693485.9208
771	682717.7930	1693983.8070	4139.35	OTC-539-LEACH	682519.9270	1693492.8548
772	682710.1830	1693984.5790	4139.16	OTC-539-FLINE	682512.3192	1693493.6265
773	682710.2190	1693987.2160	4139.18	OTC-539-FLINE	682512.3552	1693496.2628
774	682690.6020	1694039.4720	4139.43	OTC-539-BLDGCOR	682492.7439	1693548.5036
775	682684.8200	1694045.5030	4139.27	OTC-539-BLDGCOR	682486.9635	1693554.5329
776	682741.4000	1694039.0240	4140.22	OTC-539-BLDGCOR	682543.5271	1693548.0558
777	682747.1830	1694045.0970	4140.68	OTC-539-BLDGCOR	682549.3085	1693554.1270

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7824
PROFESSIONAL SURVEYOR

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
778	686068.4560	1686694.7280	4103.68	OTC-534-MW-10-PVC	685869.6189	1686205.8883
779	686068.7800	1686694.7810	4104.06	OTC-534-MW-10-CASING	685869.9428	1686205.9413
780	685846.6180	1686522.2590	4102.52	OTC-534-MW-11-CASING	685647.8452	1686033.4693
781	685846.3620	1686522.2240	4102.15	OTC-534-MW-11-PVC	685647.5893	1686033.4343
782	685670.3280	1686561.9490	4102.29	OTC-534-MW-12-PVC	685471.6063	1686073.1478
783	685670.6410	1686561.9860	4102.69	OTC-534-MW-12-CASING	685471.9192	1686073.1848

RAW DATA

HOLLOMAN AIR FORCE BASE
WEST SITE

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	684793.2210	1611172.5300	3911.93	BASE	684598.9178	1610715.3759
2	682531.9480	1628747.6200	3965.57	EC-30	682338.2864	1628285.4792
3	682452.1330	1628714.0920	3957.20	EC-30-2	682258.4940	1628251.9607
4	698323.2620	1606321.3780	3915.08	CHAS	698125.1198	1605865.6004
5	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
60	616427.1730	1576921.6540	3941.67	LUCERO	616252.2680	1576474.2182
61	600657.7750	1576446.9260	4131.58	GERI	600487.3444	1575999.6249
62	614156.5210	1568701.1170	4227.09	SW 30	613982.2602	1568256.0137
63	575518.1130	1586543.7100	4038.20	BRYCE AZ MK	575354.8155	1586093.5441
64	576512.9440	1582067.6800	4357.70	BRYCE	576349.3642	1581618.7841
65	633185.2600	1566510.7280	4417.64	HORN	633005.6000	1566066.2462
66	580320.9040	1585783.2080	4128.59	NICK 2	580156.2437	1585333.2579
67	682452.1790	1628714.1810	3957.10	EC-30-2	682258.5400	1628252.0496
68	698323.2620	1606321.3780	3914.70	CHAS	698125.1198	1605865.6004
69	698212.0050	1609477.2870	3928.40	CHUCK	698013.8943	1609020.6139
70	682531.9020	1628747.5310	3965.57	EC-30	682338.2404	1628285.3902
71	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
100	684194.1900	1611160.8710	3912.56	USTC-518-NG	684000.0567	1610703.7202
101	684194.8810	1611165.7430	3912.33	USTC-518-NG	684000.7475	1610708.5908
102	684188.7970	1611168.5190	3912.27	USTC-518-NG	683994.6653	1610711.3660
103	684189.4230	1611176.5450	3912.53	USTC-518-NG	683995.2911	1610719.3898
104	684179.6480	1611178.5150	3912.57	USTC-518-NG	683985.5189	1610721.3592
105	684178.1630	1611171.1680	3912.37	USTC-518-NG	683984.0343	1610714.0143
106	684177.1790	1611163.0630	3913.00	USTC-518-NG	683983.0506	1610705.9116
107	684157.6940	1611173.6700	3912.42	USTC-518-STATION-5	683963.5711	1610716.5156
108	684176.2170	1611179.5100	3912.28	USTC-518-STATION-4	683982.0888	1610722.3539
109	684175.8730	1611172.3430	3912.51	USTC-518-STATION-2	683981.7449	1610715.1890
110	684173.8830	1611163.3430	3912.65	USTC-518-STATION-3	683979.7555	1610706.1915
111	684189.5770	1611170.0220	3912.30	USTC-518-STATION-1	683995.4450	1610712.8686
112	684160.3220	1611172.8640	3912.49	USTC-518-POTHOLE-1	683966.1984	1610715.7098
113	684125.1520	1611185.2360	3910.93	USTC-518-MW-1	683931.0383	1610728.0783
114	684130.9190	1611216.0540	3911.17	USTC-518-MW-2	683936.8037	1610758.8876
115	684158.8770	1611187.1610	3912.34	USTC-518-BLDGCORN-70	683964.7538	1610730.0028
116	684163.9700	1611180.4420	3912.46	USTC-518-BLDGCORN-70	683969.8453	1610723.2857
117	684211.6690	1611174.1790	3912.47	USTC-518-BLDGCORN-70	684017.5308	1610717.0244
118	684218.3800	1611179.3060	3912.45	USTC-518-BLDGCORN-70	684024.2399	1610722.1500
119	684236.0190	1611144.8000	3911.88	USTC-518-NAIL	684041.8739	1610687.6538
120	684242.7800	1611133.9130	3911.77	USTC-518-NAIL	684048.6330	1610676.7699
121	684203.7200	1611162.6570	3912.21	USTC-518-STATION-6	684009.5840	1610705.5057

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7924
PROFESSIONAL SURVEYOR

Contract No. FA8903-09-D-8580, Task Order No. 0013 • ina • Revision 0 • October 2013 • WERC-09-13-071

Appendix J
Laboratory Analytical Data and Data Validation Checklists

Note: The data validation checklists and laboratory analytical data reports are provided as separate files.

Appendix K
Waste Manifests

HAFB-001

Generator's Name	Generator's Address	Generator's Telephone No.
USAF	550 TABOSA AVE Holloman AFB NM 88330	575-491-8262

Origin of Special Waste (Project or Spill Location): ~~White Sands National Monument Park - Storage Lagoons~~ Holloman AFB NM Bldg # 55

Transporter #1 Company Name	Address	Telephone No.
Southwest Disposal	1350 LaVelle Road	575-434-1109
Transporter #2 Company Name	Address	Telephone No.
	Alamogordo, NM 88310	

Destination Facility Name/Site Address	Facility ID (Permit) Number	Telephone No.
Otero/Greentree Regional Landfill 24 Mls South of Alamogordo, Hwy 54	SWM-109102	575-439-4355

Type and Proper Name of Special Waste	Container(s) No.	Container(s) Type	Total Quantity	Unit Wt/Vol	
Non RCRA/Non Hazardous Substance ~~(Treatment Plant Lagoon Sludge)~~ (soil)		SD		6.95	Tons

Additional Descriptions for Special Waste Listed Above:

Site Contact: Todd Hiltunen 307-214-6080

Special Handling Instructions:

Southwest Disposal - Lined and Covered Roll-off

GENERATOR'S CERTIFICATION I hereby certify that the contents of this shipment are fully and accurately described above by type and proper name of the special waste, and that such waste has been managed, packaged, containerized and labeled in accordance with the requirements of 20.9.8 NMAC (Special Waste Requirements) in addition to any other applicable federal, state or local regulations.

Truck # 553 Bin #

Printed/Typed Name:	Signature:	Date:
Todd Hiltunen for Brent Hunt (CES)	for Brent Hunt (CES)	9/25/12

Transporter 1 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:
David Gurnbach		9/26/12

Transporter 2 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:

Discrepancy Indication Space:

Analytical supplied to landfill

no facility ID number

Facility Owner or Operator: ***I hereby acknowledge receipt of the special waste as indicated upon this manifest, except as noted above in the Discrepancy Indication Space.***

Printed/Typed Name:	Signature:	Date:
Darrell McGinnis / Attendant		9-26-12

~~Facility~~

OTERO/GREENTREE
REGIONAL LANDFILL

TRANSACTION: 28,080

CO. NAME:

ADDRESS: Environmental Waste Solutions
1348 B. Redtail Hawk Drive

CITY & STATE: Boardman, OH 44512

DATE: 9/26/12 TIME: 9:07 am

TRUCK NO.: 198

GROSS WEIGHT 47000

TARE WEIGHT: 33100

NET TONS: 13900 6.95

COST $: [redacted]

5% TAX $:

TOTAL DUE $:

WASTE: 5

WASTE DESC.: Construction Debris
H.A.F.B.

WASTE ORIGIN:

DRIVER

Appendix L
Geochemical Evaluation of Arsenic in Soil

Appendix L
Geochemical Evaluation of Arsenic in Soil at Building 1190 (OTC533), Holloman Air Force Base

This appendix provides the methodology and results of a geochemical evaluation of arsenic concentrations in soil samples from Building 1190 (Site OTC533), Holloman Air Force Base (AFB). The 11 soil samples considered in this evaluation ("site" samples) were obtained on June 25, 2012 at several depth intervals ranging from 0.0 to 2.0 feet (ft) to 23.0 to 25.0 ft below ground surface (bgs). All of the samples were analyzed for the full suite of 23 Target Analyte List metals.

Arsenic is evaluated here because the New Mexico Environment Department (NMED) Regional Screening Level (RSL) of 3.9 milligrams per kilogram (mg/kg) for arsenic was slightly exceeded in three of the 11 site samples. The maximum arsenic concentration in these samples is 5.6 mg/kg. The three exceedances are described as follows:

- Soil sample OTC533-IS-0003-062512 from the depth interval of 10.0 to 12.0 ft bgs in soil boring OTC533-Station 2 adjacent the septic tank location had an arsenic concentration of 5.6 mg/kg.

- The field duplicate sample for soil sample OTC533-IS-0007-062512-FD from the depth interval of 10.0 to 12.0 ft bgs in soil boring OTC533-Station 3 adjacent the effluent line of the septic tank had an arsenic concentration of 5.3 mg/kg.

- Soil sample OTC533-IS-0009-062512 from the depth interval of 10.0 to 12.0 ft bgs in soil boring OTC533-Station 4 located on the downgradient side of the leach field where monitoring well boring OTC533-MW01 was installed had an arsenic concentration of 5.2 mg/kg.

Analyses of 42 background subsurface samples were used for comparison in the evaluation. These background samples were obtained from depths of 7.0 to 30.0 ft bgs at intervals that were above the water table. Descriptions of the background samples can be found in Nation View-Bhate (2009). Note that arsenic concentrations in the 42 subsurface background samples range from non-detect (<0.79 mg/kg) to 5.8 mg/kg. Arsenic concentrations in the 11 site samples are thus within the range of background.

Evaluation Methodology

Trace element distributions in soil are often right-skewed and can span a wide range of concentrations. Trace element concentrations can naturally exceed risk-based screening levels because these screening levels do not consider natural site-specific distributions of trace element concentrations.

Comparisons of concentrations in site samples to background screening values can also be problematic. The background screening values used here are based on the 95th upper tolerance limits of background distributions. By definition, one would expect that five percent, or one in 20 samples will on average exceed the background screening value even if no contamination is present.

Comparisons to risk-based screening levels and background screening values only consider the absolute concentrations of individual elements, and disregard the interdependence of element concentrations and the geochemical mechanisms controlling element behavior. However, it is well established that trace elements naturally associate with specific minerals in soil and sediment, and the preferential enrichment of a sample with these minerals will result in naturally elevated trace element concentrations. It is thus important to be able to identify these naturally high concentrations and distinguish them from potential contamination.

Recent publications indicate that geochemical evaluations are assuming a larger role in environmental investigations (e.g., EPA, 1995; Barclift, *et al*., 2000; U.S. Navy, 2002, 2003; Myers and Thorbjornsen, 2004; Thorbjornsen and Myers, 2007a, 2007b, 2008). A properly executed geochemical evaluation can distinguish between naturally high element concentrations versus contamination, and can identify the specific samples that may contain some component of site-related contamination.

Geochemical Evaluation Methodology for Soil. Trace elements naturally associate with specific soil-forming minerals, and geochemical evaluations are predicated on these known associations. For example, in most uncontaminated oxic soils, arsenic exhibits an association with iron oxide minerals. Arsenic exists in oxic soil pore fluid as oxyanions such as $HAsO_4^{-2}$ and $H_2AsO_4^{-}$ (Brookins, 1988), and these negatively charged species have a strong affinity to adsorb on iron oxides, which tend to maintain a net positive surface charge (Electric Power Research Institute, 1984). (In this report, the term "iron oxide" encompasses oxides, hydroxides, oxyhydroxides, and hydrous oxides of

iron.) This association is expressed as a positive correlation between arsenic concentrations and iron concentrations for uncontaminated samples.

As a result of these associations, soil samples with a low percentage of iron oxides will contain proportionally lower arsenic concentrations, and soil samples that are enriched in iron oxides will contain proportionally higher arsenic concentrations (Bowell, 1994). Although there is variability in the absolute concentrations of arsenic and iron in soil at a site, the arsenic/iron (As/Fe) ratios of the samples will be relatively constant if no contamination is present (Myers and Thorbjornsen, 2004). Samples that contain excess arsenic from a contaminant source (herbicides, treated wood, etc.) will exhibit anomalously high As/Fe ratios compared to the uncontaminated samples.

The reference elements against which trace elements are evaluated reflect the affinities that the trace elements have for specific minerals, which is a function of the specific geochemical environment. The concentrations of iron and aluminum serve as qualitative indicators of the amounts of iron oxide and clay minerals that are present in the soil samples (all clay minerals contain aluminum as a major component). Along with arsenic, selenium and vanadium are present in oxic soil pore fluid as anions and have an affinity to adsorb on iron oxides, which tend to maintain a net positive surface charge. Concentrations of arsenic, selenium, or vanadium in a set of samples can be evaluated through comparison to the corresponding iron concentrations. Barium, cobalt, cadmium, lead, and zinc are typically present in soil as divalent cations and have an affinity to adsorb on clay minerals, which tend to maintain a net negative surface charge. Concentrations of these elements can be evaluated through comparison to the corresponding aluminum concentrations.

To perform the geochemical evaluation, correlation plots are constructed to explore the elemental associations and identify potentially contaminated samples. The detected concentrations of the trace element of interest (dependent variable) are plotted against the detected concentrations of the reference element (independent variable), which represents the mineral to which the trace element may be adsorbed. In the case of arsenic, the arsenic concentrations for a given set of samples would be plotted on the y-axis and the corresponding iron concentrations would be plotted on the x-axis.

If no contamination is present, then the samples will exhibit a common trend with a positive slope, and the samples with the highest trace element concentrations will fall on

this trend. This indicates that the elevated trace element concentrations are due to the preferential enrichment of the minerals represented by the reference element concentrations in those samples, and that the trace element has a natural source. If, however, the samples with high trace element concentrations have low or moderate reference element concentrations, then those samples will lie above the trend established by the other samples. This indicates that the anomalous samples contain excess trace elements beyond that which can be explained by the natural reference element content, and such samples may contain a component of contamination.

Site samples with a trace element present as a contaminant will exhibit anomalously high trace-versus-major element ratios compared to background trace-versus-major element ratios. These elevated ratios may not always be apparent in log-log correlation plots, especially at the upper end of the concentration range. Therefore, ratio plots—which depict trace element concentrations on the y-axis and trace/reference element ratios on the x-axis—are employed in conjunction with correlation plots in those cases where it is not immediately apparent which site samples have anomalously high elemental ratios on the correlation plots. Ratio plots have high resolution over the entire concentration range and permit easy visual identification of samples with anomalously high elemental ratios relative to background.

It is important to note that there is natural variability, as well as analytical uncertainty, in the element ratios of uncontaminated soil samples. Trace/reference element ratios are calculated from two uncertain analytical results, so the resulting uncertainties in the ratios can produce some scatter in the points on a ratio plot. This is especially true when estimated (i.e., "J"-qualified) analytical results are used. This can be seen on some of the plots that show more scatter of the points at the lower end of the concentration range, where analytical uncertainties are higher and analytical results are reported with fewer significant figures.

Evaluation Results

Aluminum and iron are evaluated first to verify that the iron concentrations are natural and that they are therefore suitable for use as reference elements for the evaluation of arsenic.

Aluminum and Iron – Aluminum has a mean concentration of 8,300 mg/kg in the 11 site samples. Aluminum is a primary component of common soil-forming minerals such as

clays, feldspars, and micas. Aluminum is always trivalent (as Al^{3+}) and can substitute for ferric iron (Fe^{3+}) in iron oxide minerals. It can also adsorb on iron oxide surfaces (Cornell and Schwertmann, 2003).

Iron also has a mean concentration of 8,300 mg/kg in the site samples, and is dominantly present as iron oxides. Iron oxides are common soil-forming minerals and occur as discrete mineral grains or as coatings on silicate minerals (Cornell and Schwertmann, 2003).

Clays and iron oxides tend to exist as very fine particles, so both aluminum (a proxy for clay content) and iron (a proxy for iron oxide content) are enriched in samples with finer grain sizes. A plot of iron versus aluminum concentrations can be used to qualitatively assess the relative abundance of these minerals in site soil, as shown in Figure 1. The 11 site samples are represented by circles, and the 42 subsurface background soil samples are represented by triangles in the figure. The site and background samples fall on the same trend in the plot, indicating that all of the samples have similar iron/aluminum (Fe/Al) ratios.

These Fe/Al ratios can be seen more clearly on Figure 2, which shows iron concentrations versus Fe/Al ratios for each sample. The fact that the site and background samples have ratios that fall well within one order of magnitude indicates that the site samples do not contain excess aluminum or iron from a contaminant source and that their aluminum and iron concentrations are natural.

Iron is used as the reference element for arsenic so these results also indicate that the observed iron concentrations are suitable for use in evaluating the arsenic source in the site samples. As discussed previously, clays and iron oxides have an affinity to adsorb specific trace elements, so samples that are enriched in these minerals are expected to contain naturally high concentrations of trace elements, including arsenic. These are the samples that lie on the upper end of the trend in Figure 1.

Arsenic – Arsenic is known to associate with iron oxide minerals as discussed above. A soil sample that is naturally enriched in iron oxides is expected to be naturally enriched in arsenic. Figure 3 provides a plot of detected arsenic versus iron concentrations in the site and background samples. The site and background samples fall on the same trend, although this trend is less correlated than the iron versus aluminum trend shown in

Figure 1. Eight of the 11 site samples have estimated i.e., ("J"-qualified) arsenic results that are below their reporting limits (RL). Estimated results usually show less correlation on the plots because the true locations of the points are uncertain.

Figure 4 provides a ratio plot of the same arsenic and iron results. This perspective reveals that the site samples have As/Fe ratios that fall within the range of the background ratios. There is more spread in the ratios at lower arsenic concentrations, which is likely due to the estimated nature of the analytical results at lower concentrations. However, the consistent As/Fe ratios in the site samples, the agreement between the site and background ratios, and the fact that the arsenic site concentrations fall within the range of background concentrations, indicate that the observed arsenic concentrations are most likely natural.

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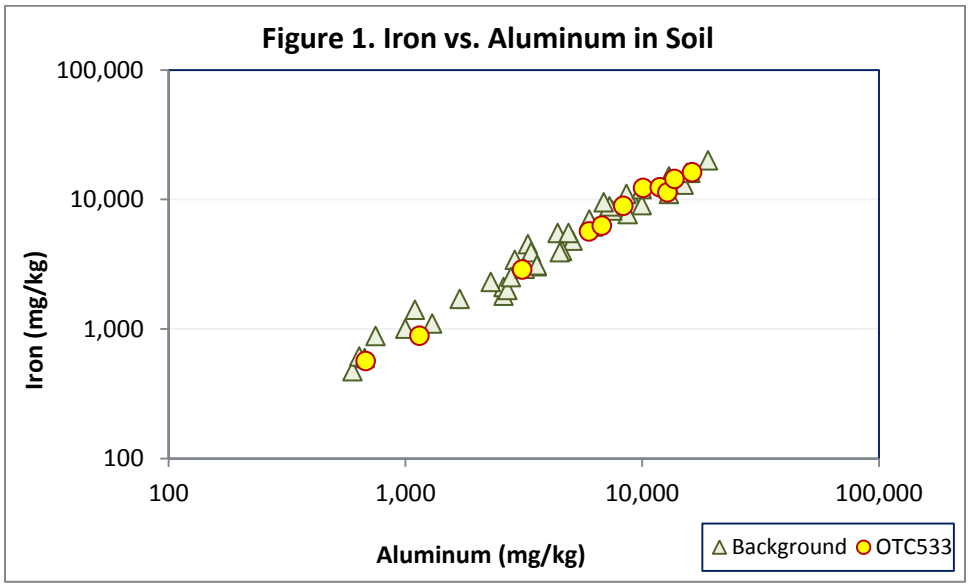
Figure 1. Iron vs. Aluminum in Soil
100,000
10,000
1,000
100
Iron (mg/kg)
100
1,000
10,000
100,000
Aluminum (mg/kg)
Background
OTC533

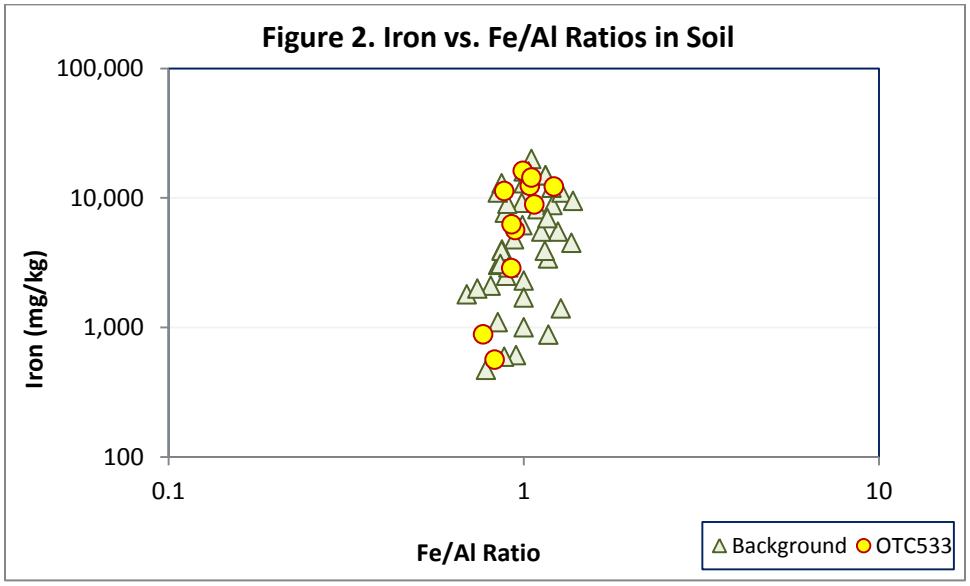
Figure 2. Iron vs. Fe/Al Ratios in Soil
100,000
10,000
1,000
100
Iron (mg/kg)
0.1
1
10
Fe/Al Ratio
Background
OTC533

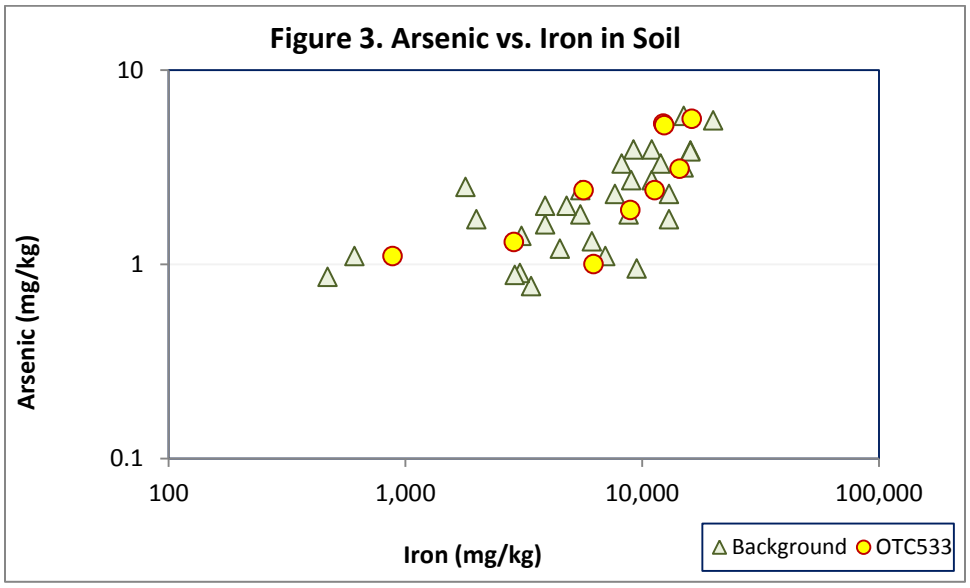
Figure 3. Arsenic vs. Iron in Soil
10
1
0.1
Arsenic (mg/kg)
100
1,000
10,000
100,000
Iron (mg/kg)
Background
OTC533

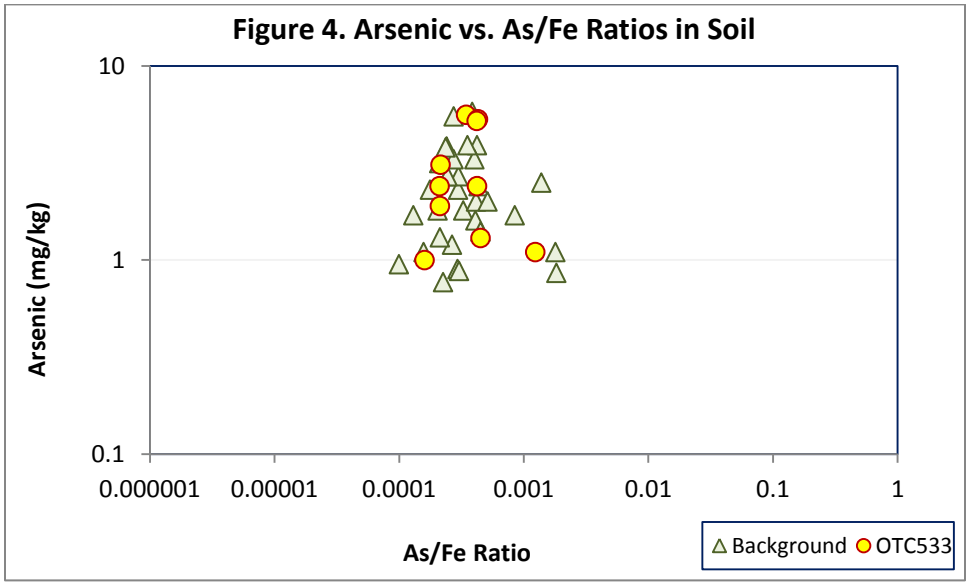
Figure 4. Arsenic vs. As/Fe Ratios in Soil
10
1
0.1
Arsenic (mg/kg)
0.000001
0.00001
0.0001
0.001
0.01
0.1
1
As/Fe Ratio
Background
OTC533

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Appendix M
Risk Evaluation Calculations

Risk Additvity
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC533-IS-0001-062512		OTC533-IS-0002-062512		OTC533-IS-0003-062512		OTC533-IS-0004-062512		OTC533-IS-0005-062512		OTC533-IS-0006-062512		OTC533-IS-0007-062512-FD		OTC533-IS-0008-062512		OTC533-IS-0009-062512		OTC533-IS-0010-062512	
				Sample Date	6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012	
				Location	OTC533-Station 1, septic tank influent line		OTC533-Station 1, septic tank influent line		OTC533-Station 2, septic tank		OTC533-Station 2, septic tank		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01	
				Depth (ft bgs)	3 - 5		10 - 12		10 - 12		17 - 19		3 - 5		10 - 12		10 - 12		3 - 5		10 - 12		0 - 2	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**88**		**82.9**		**84.9**		**85.3**		**75.3**		**81.6**		**82**		**76**		**84.5**		**88.6**	
VOLATILES (mg/kg)																								
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0011	U	0.0011	U	0.00096	U	0.00084	U	0.0019	U	0.00092	U	0.0011	U	0.0013	U	0.0011	U	0.0014	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0012	U	0.0012	U	0.0011	U	0.00091	U	0.0021	UJ	0.001	U	0.0012	U	0.0015	U	0.0012	U	0.0015	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0017	U	0.0017	U	0.0015	U	0.0013	U	0.003	U	0.0014	U	0.0016	U	0.0021	U	0.0017	U	0.0021	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0011	U	0.0011	U	0.00096	U	0.00084	U	0.0019	U	0.00092	U	0.0011	U	0.0013	U	0.0011	U	0.0014	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0011	U	0.0011	U	0.00096	U	0.00084	U	0.0019	U	0.00092	U	0.0011	U	0.0013	U	0.0011	U	0.0014	U
1,1-DICHLOROETHENE	NE	240	449		0.0014	U	0.0014	U	0.0012	U	0.0011	U	0.0025	U	0.0012	U	0.0013	U	0.0017	U	0.0014	U	0.0017	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0012	U	0.0012	U	0.0011	U	0.00091	U	0.0021	U	0.001	U	0.0012	U	0.0015	U	0.0012	U	0.0015	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0023	U	0.0023	U	0.002	U	0.0018	U	0.0041	UJ	0.0019	U	0.0022	U	0.0028	U	0.0022	U	0.0029	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.001	U	0.00098	U	0.00088	U	0.00076	U	0.0018	U	0.00084	U	0.00096	U	0.0012	U	0.00097	U	0.0012	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0011	U	0.0011	U	0.00096	U	0.00084	U	0.0019	U	0.00092	U	0.0011	U	0.0013	U	0.0011	U	0.0014	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.001	U	0.00098	U	0.00088	U	0.00076	U	0.0018	U	0.00084	U	0.00096	U	0.0012	U	0.00097	U	0.0012	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0012	U	0.0012	U	0.0011	U	0.00091	U	0.0021	U	0.001	U	0.0012	U	0.0015	U	0.0012	U	0.0015	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0012	U	0.0012	U	0.0011	U	0.00091	U	0.0021	U	0.001	U	0.0012	U	0.0015	U	0.0012	U	0.0015	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0011	U	0.0011	U	0.00096	U	0.00084	U	0.0019	U	0.00092	U	0.0011	U	0.0013	U	0.0011	U	0.0014	U
2-HEXANONE	NE	210	NE		0.0055	U	0.0053	U	0.0047	U	0.0041	U	0.0095	U	0.0045	U	0.0052	U	0.0065	U	0.0053	U	0.0067	U
ACETONE	NE	61000	66600		0.02	U	0.02	U	0.018	U	0.015	U	0.035	U	0.017	U	0.019	U	0.024	U	0.019	U	0.025	U
BENZENE	NE	1.1	15.4		0.0015	U	0.0015	U	0.0013	U	0.0011	U	0.0026	U	0.0013	U	0.0014	U	0.0018	U	0.0015	U	0.0019	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0011	UJ	0.0011	UJ	0.00096	UJ	0.00084	UJ	0.0019	U	0.00092	UJ	0.0011	U	0.0013	U	0.0011	U	0.0014	U
BROMOFORM	NE	62	616		0.0015	U	0.0015	U	0.0013	U	0.0011	U	0.0026	U	0.0013	U	0.0014	U	0.0018	U	0.0015	U	0.0019	U
BROMOMETHANE	NE	7.3	16.5		0.002	U	0.002	U	0.0018	U	0.0015	U	0.0035	U	0.0017	U	0.0019	U	0.0024	U	0.0019	U	0.0025	U
CARBON DISULFIDE	NE	820	1530		0.002	U	0.002	U	0.0018	U	0.0015	U	0.0035	U	0.0017	U	0.0019	U	0.0024	U	0.0019	U	0.0025	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0018	UJ	0.0018	UJ	0.0016	UJ	0.0014	UJ	0.0032	U	0.0015	UJ	0.0017	U	0.0022	U	0.0018	U	0.0022	U
CHLOROBENZENE	NE	290	376		0.001	U	0.00098	U	0.00088	U	0.00076	U	0.0018	U	0.00084	U	0.00096	U	0.0012	U	0.00097	U	0.0012	U
CHLOROETHANE	NE	15000	29800		0.002	U	0.002	U	0.0018	U	0.0015	U	0.0035	U	0.0017	U	0.0019	U	0.0024	U	0.0019	U	0.0025	U
CHLOROFORM	NE	0.29	5.86		0.0012	U	0.0012	U	0.0011	U	0.00091	U	0.0021	U	0.001	U	0.0012	U	0.0015	U	0.0012	U	0.0015	U
CHLOROMETHANE	NE	120	275		0.002	U	0.002	U	0.0018	U	0.0015	U	0.0035	U	0.0017	U	0.0019	U	0.0024	U	0.0019	U	0.0025	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0015	U	0.0015	U	0.0013	U	0.0011	U	0.0026	U	0.0013	U	0.0014	U	0.0018	U	0.0015	U	0.0019	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.001	U	0.00098	U	0.00088	U	0.00076	U	0.0018	U	0.00084	U	0.00096	U	0.0012	U	0.00097	U	0.0012	U
CYCLOHEXANE	NE	7000	NE		0.0014	U	0.0014	U	0.0012	U	0.0011	U	0.0025	U	0.0012	U	0.0013	U	0.0017	U	0.0014	U	0.0017	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.001	U	0.00098	U	0.00088	U	0.00076	U	0.0018	U	0.00084	U	0.00096	U	0.0012	U	0.00097	U	0.0012	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0015	U	0.0015	U	0.0013	U	0.0011	U	0.0026	U	0.0013	U	0.0014	U	0.0018	U	0.0015	U	0.0019	U
ETHYLBENZENE	NE	5.4	68.4		0.001	U	0.00098	U	0.00088	U	0.00076	U	0.0018	U	0.00084	U	0.00096	U	0.0012	U	0.00097	U	0.0012	U
ISOPROPYLBENZENE	NE	2100	2430		0.0011	U	0.0011	U	0.00096	U	0.00084	U	0.0019	U	0.00092	U	0.0011	U	0.0013	U	0.0011	U	0.0014	U
METHYL ACETATE	NE	78000	78200		0.013	U	0.012	U	0.011	U	0.0095	U	0.022	U	0.011	U	0.012	U	0.015	U	0.012	U	0.016	U
METHYL ETHYL KETONE	NE	28000	37100		0.0062	U	0.006	U	0.0053	U	0.0046	U	0.011	U	0.0051	U	0.0059	U	0.0074	U	0.0059	U	0.0076	R
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0056	U	0.0054	U	0.0048	U	0.0042	U	0.0097	U	0.0046	U	0.0053	U	0.0067	U	0.0054	U	0.0069	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0013	U	0.0013	U	0.0011	U	0.00099	U	0.0023	U	0.0011	U	0.0012	U	0.0016	U	0.0013	U	0.0016	U
METHYLENE CHLORIDE	NE	56	409		0.0047	U	0.0045	U	0.004	U	0.0035	U	0.0081	U	0.0039	U	0.0044	U	0.0056	U	0.0045	U	0.0057	U

Risk Additvity
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC533-IS-0001-062512		OTC533-IS-0002-062512		OTC533-IS-0003-062512		OTC533-IS-0004-062512		OTC533-IS-0005-062512		OTC533-IS-0006-062512		OTC533-IS-0007-062512-FD		OTC533-IS-0008-062512		OTC533-IS-0009-062512		OTC533-IS-0010-062512	
				Sample Date	6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012	
				Location	OTC533-Station 1, septic tank influent line		OTC533-Station 1, septic tank influent line		OTC533-Station 2, septic tank		OTC533-Station 2, septic tank		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01	
				Depth (ft bgs)	3 - 5		10 - 12		10 - 12		17 - 19		3 - 5		10 - 12		10 - 12		3 - 5		10 - 12		0 - 2	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																								
STYRENE	NE	6300	7280	0.0026	U	0.0025	U	0.0023	U	0.002	U	0.0046	U	0.0022	U	0.0025	U	0.0032	U	0.0025	U	0.0032	U
TERT-BUTYL METHYL ETHER	NE	43	901	0.002	U	0.002	U	0.0018	U	0.0015	U	0.0035	U	0.0017	U	0.0019	U	0.0024	U	0.0019	U	0.0025	U
TETRACHLOROETHYLENE	NE	22	7.02	0.001	U	0.00098	U	0.00088	U	0.00076	U	0.0018	U	0.00084	U	0.00096	U	0.0012	U	0.00097	U	0.0012	U
TOLUENE	NE	5000	5270	0.0012	U	0.0012	U	0.0011	U	0.00091	U	0.0021	U	0.001	UJ	0.0012	UJ	0.0015	U	0.0012	U	0.0015	U
TRANS-1,2-DICHLOROETHENE	NE	150	270	0.0015	U	0.0015	U	0.0013	U	0.0011	U	0.0026	U	0.0013	U	0.0014	U	0.0018	U	0.0015	U	0.0019	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.0011	U	0.0011	U	0.00096	U	0.00084	U	0.0019	U	0.00092	U	0.0011	U	0.0013	U	0.0011	U	0.0014	U
TRICHLOROETHYLENE	NE	0.91	8.77	0.0012	U	0.0012	U	0.0011	U	0.00091	U	0.0021	U	0.001	U	0.0012	U	0.0015	U	0.0012	U	0.0015	U
TRICHLOROFLUOROMETHANE	NE	790	1410	0.002	U	0.002	U	0.0018	U	0.0015	U	0.0035	U	0.0017	U	0.0019	U	0.0024	U	0.0019	U	0.0025	U
VINYL CHLORIDE	NE	0.06	0.728	0.0015	U	0.0015	U	0.0013	U	0.0011	U	0.0026	U	0.0013	U	0.0014	U	0.0018	U	0.0015	U	0.0019	U
XYLENES, TOTAL	NE	630	814	0.0032	U	0.0031	U	0.0028	U	0.0024	U	0.0056	U	0.0027	U	0.0031	U	0.0039	U	0.0031	U	0.004	U
SEMIVOLATILES (mg/kg)																								
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	4.6	91.5	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
2,4-DICHLOROPHENOL	NE	180	183	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
2,4-DIMETHYLPHENOL	NE	1200	1220	0.024	U	0.025	U	0.025	U	0.024	U	0.027	U	0.026	U	0.026	U	0.028	U	0.025	U	0.024	U
2,4-DINITROPHENOL	NE	120	122	0.38	U	0.4	U	0.39	U	0.39	U	0.44	U	0.42	U	0.41	U	0.44	U	0.39	U	0.37	U
2,4-DINITROTOLUENE	NE	1.6	15.7	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
2,6-DINITROTOLUENE	NE	61	61.1	0.022	U	0.024	U	0.023	U	0.023	U	0.026	U	0.025	U	0.024	U	0.026	U	0.023	U	0.022	U
2-CHLORONAPHTHALENE	NE	6300	6260	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
2-CHLOROPHENOL	NE	390	391	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
2-METHYLNAPHTHALENE	NE	230	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
2-METHYLPHENOL	NE	3100	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
2-NITROANILINE	NE	610	NE	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
2-NITROPHENOL	NE	NE	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
3-NITROANILINE	NE	NE	NE	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	0.076	U	0.08	U	0.079	U	0.077	U	0.087	U	0.083	U	0.081	U	0.087	U	0.078	U	0.075	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
4-CHLOROANILINE	NE	2.4	NE	0.019	UJ	0.02	UJ	0.02	UJ	0.019	UJ	0.022	UJ	0.021	UJ	0.02	UJ	0.022	UJ	0.02	UJ	0.019	UJ
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
4-NITROANILINE	NE	24	NE	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
4-NITROPHENOL	NE	NE	NE	0.15	U	0.16	U	0.16	U	0.15	U	0.17	U	0.17	U	0.16	U	0.17	U	0.16	U	0.15	U
ACENAPHTHENE	NE	3400	3440	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
ACENAPHTHYLENE	NE	NE	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
ACETOPHENONE	NE	7800	7820	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
ANTHRACENE	NE	17000	17200	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
ATRAZINE	NE	2.1	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U

Risk Additvity
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-IS-0001-062512		OTC533-IS-0002-062512		OTC533-IS-0003-062512		OTC533-IS-0004-062512		OTC533-IS-0005-062512		OTC533-IS-0006-062512		OTC533-IS-0007-062512-FD		OTC533-IS-0008-062512		OTC533-IS-0009-062512		OTC533-IS-0010-062512	
			Sample Date	6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012	
			Location	OTC533-Station 1, septic tank influent line		OTC533-Station 1, septic tank influent line		OTC533-Station 2, septic tank		OTC533-Station 2, septic tank		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01	
			Depth (ft bgs)	3 - 5		10 - 12		10 - 12		17 - 19		3 - 5		10 - 12		10 - 12		3 - 5		10 - 12		0 - 2	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																							
BENZALDEHYDE	NE	7800	NE	0.19	U	0.2	U	0.2	U	0.19	U	0.22	U	0.21	U	0.2	U	0.22	U	0.2	U	0.19	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
BENZO(A)PYRENE	NE	0.015	0.148	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
BIPHENYL	NE	51	57.1	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.076	U	0.08	U	0.079	U	0.077	U	0.087	U	0.083	U	0.081	U	0.087	U	0.078	U	0.075	U
CAPROLACTAM	NE	31000	NE	0.061	U	0.064	U	0.063	U	0.062	U	0.07	U	0.066	U	0.065	U	0.07	U	0.063	U	0.06	U
CARBAZOLE	NE	NE	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
CHRYSENE	NE	15	148	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
DIBENZOFURAN	NE	78	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
DIETHYL PHTHALATE	NE	49000	48900	0.076	U	0.08	U	0.079	U	0.077	U	0.087	U	0.083	U	0.081	U	0.087	U	0.078	U	0.075	U
DIMETHYL PHTHALATE	NE	611000	611000	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.076	U	0.08	U	0.079	U	0.077	U	0.087	U	0.083	U	0.081	U	0.087	U	0.078	U	0.075	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
FLUORANTHENE	NE	2300	2290	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
FLUORENE	NE	2300	2290	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.084	U	0.088	U	0.087	U	0.085	U	0.096	U	0.091	U	0.089	U	0.096	U	0.086	U	0.082	U
HEXACHLOROETHANE	NE	12	42.8	0.038	U	0.04	U	0.039	U	0.039	U	0.044	U	0.042	U	0.041	U	0.044	U	0.039	U	0.037	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
ISOPHORONE	NE	510	5120	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	UJ
M,P-CRESOL	NE	NE	NE	0.027	U	0.029	U	0.028	U	0.028	U	0.031	U	0.03	U	0.029	U	0.031	U	0.028	U	0.027	U
NAPHTHALENE	NE	3.6	43.0	0.031	U	0.032	U	0.032	U	0.031	U	0.035	U	0.033	U	0.033	U	0.035	U	0.031	U	0.03	U
NITROBENZENE	NE	4.8	53.5	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.23	U	0.24	U	0.24	U	0.23	U	0.26	U	0.25	U	0.24	U	0.26	U	0.24	U	0.22	U
PHENANTHRENE	NE	1830	1830	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
PHENOL	NE	18000	18300	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U
PYRENE	NE	1700	1720	0.019	U	0.02	U	0.02	U	0.019	U	0.022	U	0.021	U	0.02	U	0.022	U	0.02	U	0.019	U

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			Sample Date	6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012	
			Location	OTC533-Station 1, septic tank influent line		OTC533-Station 1, septic tank influent line		OTC533-Station 2, septic tank		OTC533-Station 2, septic tank		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01	
			Depth (ft bgs)	3 - 5		10 - 12		10 - 12		17 - 19		3 - 5		10 - 12		10 - 12		3 - 5		10 - 12		0 - 2	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																							
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.062	U	0.071	U	0.065	U	0.066	U	0.078	U	0.068	U	0.072	U	0.067	U	0.063	U	0.074	U
1,3-DINITROBENZENE	NE	6.10	NE	0.062	U	0.071	U	0.065	U	0.066	U	0.078	U	0.068	U	0.072	U	0.067	U	0.063	U	0.074	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.062	U	0.071	U	0.065	U	0.066	U	0.078	U	0.068	U	0.072	U	0.067	U	0.063	U	0.074	U
2,4-DINITROTOLUENE	NE	1.60	15.7	0.075	U	0.087	U	0.079	U	0.08	U	0.095	U	0.082	U	0.087	U	0.082	U	0.077	U	0.089	U
2,6-DINITROTOLUENE	NE	61.0	61.1	0.068	U	0.078	U	0.07	U	0.072	U	0.085	U	0.073	U	0.078	U	0.073	U	0.069	U	0.08	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.062	U	0.071	U	0.065	U	0.066	U	0.078	U	0.068	U	0.072	U	0.067	U	0.063	U	0.074	U
2-NITROTOLUENE	NE	2.90	29.1	0.062	U	0.071	U	0.065	U	0.066	U	0.078	U	0.068	U	0.072	U	0.067	U	0.063	U	0.074	U
3-NITROTOLUENE	NE	6.10	7.82	0.062	U	0.071	U	0.065	U	0.066	U	0.078	U	0.068	U	0.072	U	0.067	U	0.063	U	0.074	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.062	U	0.071	U	0.065	U	0.066	U	0.078	U	0.068	U	0.072	U	0.067	U	0.063	U	0.074	U
4-NITROTOLUENE	NE	30.0	244.4	0.079	U	0.09	U	0.082	U	0.084	U	0.099	U	0.085	U	0.091	U	0.085	U	0.08	U	0.093	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.160	U	0.180	U	0.160	U	0.170	U	0.200	U	0.170	U	0.180	U	0.170	U	0.160	U	0.180	U
NITROBENZENE	NE	4.80	53.5	0.072	U	0.083	U	0.075	U	0.077	U	0.091	U	0.078	U	0.083	U	0.078	U	0.074	U	0.086	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.062	U	0.071	U	0.065	U	0.066	U	0.078	U	0.068	U	0.072	U	0.067	U	0.063	U	0.074	U
TETRYL	NE	240.0	244.0	0.062	U	0.071	U	0.065	U	0.066	U	0.078	U	0.068	U	0.072	U	0.067	U	0.063	U	0.074	U
PCBS (mg/kg)																							
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0076	U	0.0081	U	0.0077	U	0.0078	UJ	0.0088	U	0.0081	U	0.0081	U	0.0088	U	0.0079	U	0.0074	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.0094	U	0.01	U	0.0097	U	0.0098	U	0.011	U	0.01	U	0.01	U	0.011	U	0.0099	U	0.0093	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.0094	U	0.01	U	0.0097	U	0.0098	U	0.011	U	0.01	U	0.01	U	0.011	U	0.0099	U	0.0093	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0076	U	0.0081	U	0.0077	U	0.0078	U	0.0088	U	0.0081	U	0.0081	U	0.0088	U	0.0079	U	0.0074	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0076	U	0.0081	U	0.0077	U	0.0078	U	0.0088	U	0.0081	U	0.0081	U	0.0088	U	0.0079	U	0.0074	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0076	U	0.0081	U	0.0077	U	0.0078	U	0.0088	U	0.0081	U	0.0081	U	0.0088	U	0.0079	U	0.0074	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0076	U	0.0081	U	0.0077	U	0.0078	UJ	0.0088	U	0.0081	U	0.0081	U	0.0088	U	0.0079	U	0.0074	U
METALS (mg/kg)																							
ALUMINUM	13722	77000	78000	**5980**	J	**6760**		**16300**		**3120**		**681**		**8340**		**10100**		**1150**		**11900**		**12800**	
ANTIMONY	1.6	31	31.3	0.91	UJ	0.87	U	0.9	U	0.92	U	1.3	U	0.88	U	0.79	U	1.8	U	1.2	U	0.77	U
ARSENIC	3.7	0.39	3.90	**2.4**	J	**1**	J	**5.6**		**1.3**	J	1.3	U	**1.9**	J	**5.3**		**1.1**	J	**5.2**	J	**2.4**	J
BARIUM	169.3	15000	15600	**77.1**	J	**69.5**	J	**102**		**30.8**	J	**15**	J	**64.3**	J	**92.5**		**21.8**	J	**73.5**	J	**91**	
BERYLLIUM	1.6	160	156	0.45	U	0.44	U	**1.1**	J	0.46	U	0.63	U	**0.48**	J	**0.66**	J	0.44	U	**0.81**	J	**0.55**	J
CADMIUM	0.3	70	70.3	0.45	U	0.44	U	0.45	U	0.46	U	0.63	U	0.44	U	0.39	U	0.88	U	0.59	U	0.39	U
CALCIUM	317332	NE	NE	**210000**		**214000**		**170000**		**243000**		**219000**		**187000**		**174000**		**266000**		**170000**		**143000**	
CHROMIUM[d]	25	117000	117000	**5.4**	J	**6.7**		**18**		**2.9**	J	**0.8**	J	**8.8**		**11.2**		**1.3**	J	**12.9**		**11.3**	
COBALT	7.7	23	NE	**2.6**	J	**2.8**	J	**6.7**	J	**1.3**	J	0.63	U	**3.4**	J	**4.5**	J	**0.51**	J	**5.7**	J	**4.3**	J
COPPER	13	3100	3130	**5.1**	J	**4.2**	J	**10.5**	J	**1.9**	J	**1.4**	J	**5.6**	J	**7.8**	J	**2**	J	**8.3**	J	**9.7**	
IRON	23049	55000	54800	**5660**	J	**6250**		**16200**		**2880**		**564**		**8940**		**12300**		**884**		**12400**		**11300**	
LEAD	10.9	400	400	**4.5**	J	**4.7**	J	**10.6**		**3.1**	J	0.63	U	**5.6**	J	**7.1**	J	0.88	U	**6.8**	J	**7.3**	J
MAGNESIUM	16991	NE	NE	**2540**		**4260**		**22200**		**2340**		**1460**	J	**10300**		**18500**		**1180**	J	**21200**		**9780**	
MANGANESE	393	1800	1860	**123**		**130**		**216**		**49.5**		**11.7**		**109**		**147**		**17.2**		**174**		**269**	
MERCURY	10.8	10	15.6	0.009	U	0.0097	U	**0.011**	J	0.0092	U	0.011	U	0.0091	U	0.0092	U	0.01	U	0.0095	U	0.009	U
NICKEL	17.4	1500	1560	**5.2**	J	**6**	J	**17.4**	J	**2.8**	J	**1**	J	**7.6**	J	**10.4**	J	**1.1**	J	**12.5**	J	**9.5**	J
POTASSIUM	5077	NE	NE	**1590**	J	**1510**	J	**3190**	J	**861**	J	320	U	**1800**	J	**2040**	J	**367**	J	**2390**	J	**3480**	J

Risk Additvity
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC533-IS-0001-062512		OTC533-IS-0002-062512		OTC533-IS-0003-062512		OTC533-IS-0004-062512		OTC533-IS-0005-062512		OTC533-IS-0006-062512		OTC533-IS-0007-062512-FD		OTC533-IS-0008-062512		OTC533-IS-0009-062512		OTC533-IS-0010-062512	
				Sample Date		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012		6/25/2012	
				Location		OTC533-Station 1, septic tank influent line		OTC533-Station 1, septic tank influent line		OTC533-Station 2, septic tank		OTC533-Station 2, septic tank		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01	
				Depth (ft bgs)		3 - 5		10 - 12		10 - 12		17 - 19		3 - 5		10 - 12		10 - 12		3 - 5		10 - 12		0 - 2	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
METALS - continued (mg/kg)																									
SELENIUM	1.4	390	391	**2.2**	J	1.7	U	1.8	U	1.8	U	2.5	U	1.8	U	1.6	U	3.5	U	2.3	U	1.5	U		
SILVER	1.1	390	391	0.45	U	0.44	U	0.45	U	0.46	U	0.63	U	0.44	U	0.39	U	0.44	U	0.59	U	0.39	U		
SODIUM	5200	NE	NE	500	U	480	U	**519**	J	**590**	J	700	U	480	U	**532**	J	480	U	**831**	J	**2290**	J		
THALLIUM	1.3	0.78	0.782	1.2	U	1.1	U	1.2	U	1.2	U	1.6	U	1.1	U	1	U	2.3	U	1.5	U	1	U		
VANADIUM	42.6	390	391	**12.3**	J	**12**	J	**30.8**		**7.3**	J	**2.8**	J	**18.1**	J	**28.6**		**3**	J	**27.6**	J	**17**	J		
ZINC	54.6	23000	23500	**16.9**		**14.6**		**44.3**		**7.9**	J	3.2	U	**22.1**		**27**		4.4	U	**30.7**		**37.1**			
PETROLEUM HYDROCARBONS (mg/kg)																									
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	3.1	U	3.6	U	3.4	U	2.4	U	4.2	U	2.9	U	3	U	4	U	3	U	3.2	U		
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	**6.48**	J	4	U	3.9	U	3.9	U	4.4	U	4	U	4	U	4.4	U	3.9	U	3.7	U		
OIL RANGE ORGANICS C28-C40	NE	NE	1000	**9.8**		**7.21**	J	3.9	U	3.9	U	4.4	U	4	U	4	U	4.4	U	3.9	U	3.7	U		
CYANIDE (mg/kg)																									
CYANIDE	NE	22.0	46.9	0.068	U	0.072	U	0.071	U	0.07	U	0.08	U	0.074	U	0.073	U	0.079	U	0.07	U	0.066	U		
TRITIUM (pCi/g)																									
TRITIUM	NE	NE	NE	4.99	U	5.04	U	4.95	U	4.93	U	5.1	U	5.03	U	4.99	U	4.9	U	5.06	U	4.88	U		

Risk Additvity
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC533-IS-0011-062512		OTC533-SL-0001-062712		OTC533-CS-0001-092612		OTC533-CS-0002-092612	
				Sample Date		6/25/2012		6/27/2012		9/26/2012		9/26/2012	
				Location		OTC533-Station 4, leach field, OTC533-MW01		Septic tank sludge		Beneath septic tank		Beneath septic tank	
				Depth (ft bgs)		23 - 25		0 - 1		0 - 0.5		4.5 - 5	
						Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE			**77.9**		**57.1**					
VOLATILES (mg/kg)													
1,1,1-TRICHLOROETHANE	NE	8700	15600			0.00086	U	0.0019	U	0.0059	UJ	0.0056	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02			0.00093	U	0.002	U	0.0059	U	0.0056	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100			0.0013	U	0.0029	U	0.0059	U	0.0056	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81			0.00086	U	0.0019	U	0.0059	U	0.0056	U
1,1-DICHLOROETHANE	NE	3.3	64.5			0.00086	U	0.0019	U	0.0059	U	0.0056	U
1,1-DICHLOROETHENE	NE	240	449			0.0011	U	0.0024	U	0.0059	U	0.0056	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0			0.00093	U	0.002	UJ	0.0059	U	0.0056	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86			0.0018	U	0.0039	UJ	0.0059	UJ	0.0056	U
1,2-DIBROMOETHANE	NE	0.034	0.588			0.00078	U	0.0017	U	0.0059	U	0.0056	U
1,2-DICHLOROBENZENE	NE	1900	2310			0.00086	UJ	0.0019	U	0.0059	U	0.0056	U
1,2-DICHLOROETHANE	NE	0.43	7.89			0.00078	U	0.0017	U	0.0059	U	0.0056	U
1,2-DICHLOROPROPANE	NE	0.94	15.2			0.00093	U	0.002	U	0.0059	U	0.0056	U
1,3-DICHLOROBENZENE	NE	NE	NE			0.00093	U	0.002	U	0.0059	U	0.0056	U
1,4-DICHLOROBENZENE	NE	2.4	31.7			0.00086	UJ	0.0019	U	0.0059	U	0.0056	U
2-HEXANONE	NE	210	NE			0.0042	U	0.0091	U	0.03	U	0.028	U
ACETONE	NE	61000	66600			0.016	UJ	**0.0494**	J	0.059	U	0.056	U
BENZENE	NE	1.1	15.4			0.0012	U	0.0025	U	0.0059	U	0.0056	U
BROMODICHLOROMETHANE	NE	0.27	5.41			0.00086	U	0.0019	U	0.0059	U	0.0056	U
BROMOFORM	NE	62	616			0.0012	U	0.0025	U	0.0059	U	0.0056	U
BROMOMETHANE	NE	7.3	16.5			0.0016	U	0.0034	U	0.0059	U	0.0056	U
CARBON DISULFIDE	NE	820	1530			0.0016	U	0.0034	U	0.0059	U	0.0056	U
CARBON TETRACHLORIDE	NE	0.61	10.8			0.0014	U	0.003	U	0.0059	U	0.0056	U
CHLOROBENZENE	NE	290	376			0.00078	U	0.0017	U	0.0059	U	0.0056	U
CHLOROETHANE	NE	15000	29800			0.0016	U	0.0034	U	0.0059	U	0.0056	U
CHLOROFORM	NE	0.29	5.86			0.00093	U	0.002	U	0.0059	U	0.0056	U
CHLOROMETHANE	NE	120	275			0.0016	U	0.0034	U	0.0059	U	0.0056	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156			0.0012	U	0.0025	U	0.0059	U	0.0056	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE			0.00078	UJ	0.0017	U	0.0059	U	0.0056	U
CYCLOHEXANE	NE	7000	NE			0.0011	UJ	0.0024	U	0.0059	U	0.0056	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1			0.00078	U	0.0017	U	0.0059	U	0.0056	U
DICHLORODIFLUOROMETHANE	NE	94	168			0.0012	U	0.0025	U	0.0059	U	0.0056	U
ETHYLBENZENE	NE	5.4	68.4			0.00078	U	0.0017	U	0.0059	U	0.0056	U
ISOPROPYLBENZENE	NE	2100	2430			0.00086	UJ	0.0019	U	0.0059	U	0.0056	U
METHYL ACETATE	NE	78000	78200			0.0097	UJ	0.021	U	0.03	U	0.028	U
METHYL ETHYL KETONE	NE	28000	37100			0.0048	R	0.01	U	0.03	U	0.028	U
METHYL ISOBUTYL KETONE	NE	5300	5820			0.0043	UJ	0.0093	U	0.03	U	0.028	U
METHYLCYCLOHEXANE	NE	5630	5630			0.001	UJ	0.0022	U	0.0059	U	0.0056	U
METHYLENE CHLORIDE	NE	56	409			0.0036	U	0.0078	U	0.012	U	0.011	U

Risk Additivity Evaluation at Building 1190, Holloman AFB

0-10 ft bgs, and without sludge sample

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
1,1,1-TRICHLOROETHANE		ND		
1,1,2,2-TETRACHLOROETHANE		ND		
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND		
1,1,2-TRICHLOROETHANE		ND		
1,1-DICHLOROETHANE		ND		
1,1-DICHLOROETHENE		ND		
1,2,4-TRICHLOROBENZENE		ND		
1,2-DIBROMO-3-CHLOROPROPANE		ND		
1,2-DIBROMOETHANE		ND		
1,2-DICHLOROBENZENE		ND		
1,2-DICHLOROETHANE		ND		
1,2-DICHLOROPROPANE		ND		
1,3-DICHLOROBENZENE		ND		
1,4-DICHLOROBENZENE		ND		
2-HEXANONE		ND		
ACETONE		ND		
BENZENE		ND		
BROMODICHLOROMETHANE		ND		
BROMOFORM		ND		
BROMOMETHANE		ND		
CARBON DISULFIDE		ND		
CARBON TETRACHLORIDE		ND		
CHLOROBENZENE		ND		
CHLOROETHANE		ND		
CHLOROFORM		ND		
CHLOROMETHANE		ND		
CIS-1,2-DICHLOROETHYLENE		ND		
CIS-1,3-DICHLOROPROPENE		ND		
CYCLOHEXANE		ND		
DIBROMOCHLOROMETHANE		ND		
DICHLORODIFLUOROMETHANE		ND		
ETHYLBENZENE		ND		
ISOPROPYLBENZENE		ND		
METHYL ACETATE		ND		
METHYL ETHYL KETONE		ND		
METHYL ISOBUTYL KETONE		ND		
METHYLCYCLOHEXANE		ND		
METHYLENE CHLORIDE		ND		

Risk Additvity
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-IS-0011-062512		OTC533-SL-0001-062712		OTC533-CS-0001-092612		OTC533-CS-0002-092612	
			Sample Date	6/25/2012		6/27/2012		9/26/2012		9/26/2012	
			Location	OTC533-Station 4, leach field, OTC533-MW01		Septic tank sludge		Beneath septic tank		Beneath septic tank	
			Depth (ft bgs)	23 - 25		0 - 1		0 - 0.5		4.5 - 5	
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)											
STYRENE	NE	6300	7280	0.002	U	0.0044	U	0.0059	U	0.0056	U
TERT-BUTYL METHYL ETHER	NE	43	901	0.0016	U	0.0034	U	0.0059	U	0.0056	U
TETRACHLOROETHYLENE	NE	22	7.02	0.00078	U	0.0017	U	0.0059	U	0.0056	U
TOLUENE	NE	5000	5270	0.00093	U	0.002	U	0.0059	U	0.0056	U
TRANS-1,2-DICHLOROETHENE	NE	150	270	0.0012	U	0.0025	U	0.0059	U	0.0056	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.00086	UJ	0.0019	U	0.0059	UJ	0.0056	U
TRICHLOROETHYLENE	NE	0.91	8.77	0.00093	U	0.002	U	0.0059	U	0.0056	U
TRICHLOROFLUOROMETHANE	NE	790	1410	0.0016	U	0.0034	U	0.0059	U	0.0056	U
VINYL CHLORIDE	NE	0.06	0.728	0.0012	U	0.0025	U	0.0059	U	0.0056	U
XYLENES, TOTAL	NE	630	814	0.0025	U	0.0054	U	0.018	U	0.017	U
SEMIVOLATILES (mg/kg)											
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	4.6	91.5	0.022	U	0.12	U	0.21	U	0.2	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110	0.022	U	0.12	U	0.21	U	0.2	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1	0.022	U	0.12	U	0.21	U	0.2	U
2,4-DICHLOROPHENOL	NE	180	183	0.022	U	0.12	U	0.21	U	0.2	U
2,4-DIMETHYLPHENOL	NE	1200	1220	0.027	U	0.15	U	0.21	U	0.2	U
2,4-DINITROPHENOL	NE	120	122	0.43	U	2.3	UJ	1.1	U	1	U
2,4-DINITROTOLUENE	NE	1.6	15.7	0.022	U	0.12	U	0.21	U	0.2	U
2,6-DINITROTOLUENE	NE	61	61.1	0.026	U	0.14	U	0.21	U	0.2	U
2-CHLORONAPHTHALENE	NE	6300	6260	0.043	U	0.23	U	0.21	U	0.2	U
2-CHLOROPHENOL	NE	390	391	0.022	U	0.12	U	0.21	U	0.2	U
2-METHYLNAPHTHALENE	NE	230	NE	0.022	U	0.12	U	0.21	U	0.2	U
2-METHYLPHENOL	NE	3100	NE	0.022	U	0.12	U	0.21	U	0.2	U
2-NITROANILINE	NE	610	NE	0.043	U	0.23	U	0.21	U	0.2	U
2-NITROPHENOL	NE	NE	NE	0.022	U	0.12	U	0.21	U	0.2	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	0.043	U	0.23	U	0.21	U	0.2	U
3-NITROANILINE	NE	NE	NE	0.043	U	0.23	U	0.21	U	0.2	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	0.087	U	0.47	U	0.42	U	0.4	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.022	U	0.12	U	0.21	U	0.2	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	0.022	U	0.12	U	0.21	U	0.2	U
4-CHLOROANILINE	NE	2.4	NE	0.022	UJ	0.12	U	0.21	U	0.2	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.022	U	0.12	U	0.21	U	0.2	U
4-NITROANILINE	NE	24	NE	0.043	U	0.23	U	0.21	U	0.2	U
4-NITROPHENOL	NE	NE	NE	0.17	U	0.93	U	1.1	U	1	U
ACENAPHTHENE	NE	3400	3440	0.022	U	0.12	U	0.21	U	0.2	U
ACENAPHTHYLENE	NE	NE	NE	0.022	U	0.12	U	0.21	U	0.2	U
ACETOPHENONE	NE	7800	7820	0.022	U	0.163	J	0.21	U	0.2	U
ANTHRACENE	NE	17000	17200	0.022	U	**0.125**	J	0.21	U	0.2	U
ATRAZINE	NE	2.1	NE	0.022	U	0.12	U	0.21	U	0.2	U

Risk Additivity Evaluation at Building 1190, Holloman AFB

0-10 ft bgs, and without sludge sample

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
VOLATILES - continued (mg/kg)				
STYRENE		ND		
TERT-BUTYL METHYL ETHER		ND		
TETRACHLOROETHYLENE		ND		
TOLUENE		ND		
TRANS-1,2-DICHLOROETHENE		ND		
TRANS-1,3-DICHLOROPROPENE		ND		
TRICHLOROETHYLENE		ND		
TRICHLOROFLUOROMETHANE		ND		
VINYL CHLORIDE		ND		
XYLENES, TOTAL		ND		
SEMIVOLATILES (mg/kg)				
2,2'-OXYBIS(1-CHLORO)PROPANE		ND		
2,4,5-TRICHLOROPHENOL		ND		
2,4,6-TRICHLOROPHENOL		ND		
2,4-DICHLOROPHENOL		ND		
2,4-DIMETHYLPHENOL		ND		
2,4-DINITROPHENOL		ND		
2,4-DINITROTOLUENE		ND		
2,6-DINITROTOLUENE		ND		
2-CHLORONAPHTHALENE		ND		
2-CHLOROPHENOL		ND		
2-METHYLNAPHTHALENE		ND		
2-METHYLPHENOL		ND		
2-NITROANILINE		ND		
2-NITROPHENOL		ND		
3,3'-DICHLOROBENZIDINE		ND		
3-NITROANILINE		ND		
4,6-DINITRO-2-METHYLPHENOL		ND		
4-BROMOPHENYL PHENYL ETHER		ND		
4-CHLORO-3-METHYLPHENOL		ND		
4-CHLOROANILINE		ND		
4-CHLOROPHENYL PHENYL ETHER		ND		
4-NITROANILINE		ND		
4-NITROPHENOL		ND		
ACENAPHTHENE		ND		
ACENAPHTHYLENE		ND		
ACETOPHENONE		ND		
ANTHRACENE		ND		
ATRAZINE		ND		

Risk Additvity
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-IS-0011-062512		OTC533-SL-0001-062712		OTC533-CS-0001-092612		OTC533-CS-0002-092612	
			Sample Date	6/25/2012		6/27/2012		9/26/2012		9/26/2012	
			Location	OTC533-Station 4, leach field, OTC533-MW01		Septic tank sludge		Beneath septic tank		Beneath septic tank	
			Depth (ft bgs)	23 - 25		0 - 1		0 - 0.5		4.5 - 5	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)											
BENZALDEHYDE	NE	7800	NE	0.22	U	1.2	U	1.1	UJ	1	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.022	U	**0.668**	J	**0.0309**	J	0.2	U
BENZO(A)PYRENE	NE	0.015	0.148	0.022	U	**0.661**	J	**0.0238**	J	0.2	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.022	U	**0.821**	J	**0.0257**	J	0.2	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.022	U	**0.504**	J	0.21	U	0.2	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.022	U	**0.54**	J	**0.0257**	J	0.2	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.043	U	**0.349**	J	0.21	U	0.2	U
BIPHENYL	NE	51	57.1	0.022	U	0.12	U	0.21	U	0.2	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.022	U	0.12	U	0.21	U	0.2	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.022	U	0.12	U	0.21	U	0.2	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.087	U	**18.3**		**0.262**	J	0.4	U
CAPROLACTAM	NE	31000	NE	0.069	U	0.37	U	0.21	U	0.2	U
CARBAZOLE	NE	NE	NE	0.022	U	0.12	U	0.21	U	0.2	U
CHRYSENE	NE	15	148	0.022	U	**0.763**	J	**0.0332**	J	0.2	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.022	U	**0.164**	J	0.21	U	0.2	U
DIBENZOFURAN	NE	78	NE	0.022	U	0.12	U	0.21	U	0.2	U
DIETHYL PHTHALATE	NE	49000	48900	0.087	U	0.47	U	0.42	U	0.4	U
DIMETHYL PHTHALATE	NE	611000	611000	0.043	U	0.23	U	0.21	U	0.2	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.087	U	0.47	U	0.42	U	0.4	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.043	U	**1.44**		0.21	U	0.2	U
FLUORANTHENE	NE	2300	2290	0.022	U	**1.17**	J	**0.037**	J	0.2	U
FLUORENE	NE	2300	2290	0.022	U	0.12	U	0.21	U	0.2	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.022	U	0.12	U	0.21	U	0.2	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.043	U	0.23	U	0.21	U	0.2	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.095	U	0.51	UJ	0.21	U	0.2	U
HEXACHLOROETHANE	NE	12	42.8	0.043	U	0.23	U	0.21	U	0.2	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.022	U	**0.49**	J	0.21	U	0.2	U
ISOPHORONE	NE	510	5120	0.022	U	0.12	UJ	0.21	U	0.2	U
M,P-CRESOL	NE	NE	NE	0.031	U	0.17	U	0.21	U	0.2	U
NAPHTHALENE	NE	3.6	43.0	0.035	U	0.19	U	0.21	U	0.2	U
NITROBENZENE	NE	4.8	53.5	0.022	U	0.12	U	0.21	U	0.2	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.022	U	0.12	U	0.21	U	0.2	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.022	U	0.12	U	0.21	U	0.2	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.26	U	1.4	U	1.1	U	1	U
PHENANTHRENE	NE	1830	1830	0.022	U	**0.508**	J	0.21	U	0.2	U
PHENOL	NE	18000	18300	0.022	U	0.12	U	0.21	U	0.2	U
PYRENE	NE	1700	1720	0.022	U	**1.02**	J	**0.0339**	J	0.2	U

Risk Additivity Evaluation at Building 1190, Holloman AFB

0-10 ft bgs, and without sludge sample

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
SEMIVOLATILES - continued (mg/kg)				
BENZALDEHYDE		ND		
BENZO(A)ANTHRACENE	C	0.0309	2.09E-07	
BENZO(A)PYRENE	C	0.0238	1.61E-06	
BENZO(B)FLUORANTHENE	C	0.0257	1.74E-07	
BENZO(G,H,I)PERYLENE		ND		
BENZO(K)FLUORANTHENE	C	0.0257	1.74E-08	
BENZYL BUTYL PHTHALATE		ND		
BIPHENYL		ND		
BIS(2-CHLOROETHOXY) METHANE		ND		
BIS(2-CHLOROETHYL) ETHER		ND		
BIS(2-ETHYLHEXYL) PHTHALATE	C	0.262	7.54E-09	
CAPROLACTAM		ND		
CARBAZOLE		ND		
CHRYSENE	C	0.0332	2.25E-09	
DIBENZ(A,H)ANTHRACENE		ND		
DIBENZOFURAN		ND		
DIETHYL PHTHALATE		ND		
DIMETHYL PHTHALATE		ND		
DI-N-BUTYL PHTHALATE		ND		
DI-N-OCTYLPHTHALATE		ND		
FLUORANTHENE	N	0.037		0.000016
FLUORENE		ND		
HEXACHLOROBENZENE		ND		
HEXACHLOROBUTADIENE		ND		
HEXACHLOROCYCLOPENTADIENE		ND		
HEXACHLOROETHANE		ND		
INDENO(1,2,3-C,D)PYRENE		ND		
ISOPHORONE		ND		
M,P-CRESOL		ND		
NAPHTHALENE		ND		
NITROBENZENE		ND		
N-NITROSODI-N-PROPYLAMINE		ND		
N-NITROSODIPHENYLAMINE		ND		
PENTACHLOROPHENOL		ND		
PHENANTHRENE		ND		
PHENOL		ND		
PYRENE	N	0.0339		0.000020

Risk Additvity
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-IS-0011-062512		OTC533-SL-0001-062712		OTC533-CS-0001-092612		OTC533-CS-0002-092612	
			Sample Date	6/25/2012		6/27/2012		9/26/2012		9/26/2012	
			Location	OTC533-Station 4, leach field, OTC533-MW01		Septic tank sludge		Beneath septic tank		Beneath septic tank	
			Depth (ft bgs)	23 - 25		0 - 1		0 - 0.5		4.5 - 5	
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)											
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.066	U	0.073	U	NA		NA	
1,3-DINITROBENZENE	NE	6.10	NE	0.066	U	0.073	U	NA		NA	
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.066	U	0.073	U	NA		NA	
2,4-DINITROTOLUENE	NE	1.60	15.7	0.08	U	0.088	U	NA		NA	
2,6-DINITROTOLUENE	NE	61.0	61.1	0.072	U	0.079	U	NA		NA	
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.066	U	0.073	U	NA		NA	
2-NITROTOLUENE	NE	2.90	29.1	0.066	U	0.073	U	NA		NA	
3-NITROTOLUENE	NE	6.10	7.82	0.066	U	0.073	U	NA		NA	
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.066	U	0.073	U	NA		NA	
4-NITROTOLUENE	NE	30.0	244.4	0.084	U	0.092	U	NA		NA	
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.170	U	0.073	U	NA		NA	
NITROBENZENE	NE	4.80	53.5	0.077	U	0.085	U	NA		NA	
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.066	U	0.073	U	NA		NA	
TETRYL	NE	240.0	244.0	0.066	U	0.073	U	NA		NA	
PCBS (mg/kg)											
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0086	U	0.012	U	0.021	U	0.02	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.011	U	0.014	U	0.021	U	0.02	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.011	U	0.014	U	0.021	U	0.02	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0086	U	0.012	U	0.021	U	0.02	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0086	U	0.012	U	0.021	U	0.02	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0086	U	**0.2**		0.021	U	0.02	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0086	U	0.012	U	0.021	U	0.02	U
METALS (mg/kg)											
ALUMINUM	13722	77000	78000	**13700**		**9330**		NA		NA	
ANTIMONY	1.6	31	31.3	1.2	U	**2.5**	J	NA		NA	
ARSENIC	3.7	0.39	3.90	**3.1**	J	**6.4**	J	NA		NA	
BARIUM	169.3	15000	15600	**114**	J	**669**		NA		NA	
BERYLLIUM	1.6	160	156	**0.91**	J	0.82	U	NA		NA	
CADMIUM	0.3	70	70.3	0.62	U	**15.1**		NA		NA	
CALCIUM	317332	NE	NE	**159000**		**109000**		NA		NA	
CHROMIUM[d]	25	117000	117000	**16**		**59.1**		NA		NA	
COBALT	7.7	23	NE	**5.3**	J	**5.9**	J	NA		NA	
COPPER	13	3100	3130	**11.3**	J	**480**		NA		NA	
IRON	23049	55000	54800	**14400**		**31500**		NA		NA	
LEAD	10.9	400	400	**8.7**	J	**158**		NA		NA	
MAGNESIUM	16991	NE	NE	**8050**		**7430**		NA		NA	
MANGANESE	393	1800	1860	**164**		**246**		NA		NA	
MERCURY	10.8	10	15.6	**0.016**	J	**12.7**		NA		NA	
NICKEL	17.4	1500	1560	**13.9**	J	**68.8**		NA		NA	
POTASSIUM	5077	NE	NE	**3000**	J	**1550**	J	NA		NA	

Risk Additivity Evaluation at Building 1190, Holloman AFB

0-10 ft bgs, and without sludge sample

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio	
EXPLOSIVES (mg/kg)					
1,3,5-TRINITROBENZENE		ND			
1,3-DINITROBENZENE		ND			
2,4,6-TRINITROTOLUENE		ND			
2,4-DINITROTOLUENE		ND			
2,6-DINITROTOLUENE		ND			
2-AMINO-4,6-DINITROTOLUENE		ND			
2-NITROTOLUENE		ND			
3-NITROTOLUENE		ND			
4-AMINO-2,6-DINITROTOLUENE		ND			
4-NITROTOLUENE		ND			
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE		ND			
NITROBENZENE		ND			
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE		ND			
TETRYL		ND			
PCBS (mg/kg)					
PCB-1016 (AROCLOR 1016)		ND			
PCB-1221 (AROCLOR 1221)		ND			
PCB-1232 (AROCLOR 1232)		ND			
PCB-1242 (AROCLOR 1242)		ND			
PCB-1248 (AROCLOR 1248)		ND			
PCB-1254 (AROCLOR 1254)		ND			
PCB-1260 (AROCLOR 1260)		ND			
METALS (mg/kg)					
ALUMINUM	N	12800		0.164103	
ANTIMONY	N	ND			
ARSENIC	C	2.4	6.16E-06		
BARIUM	N	91		0.005833	
BERYLLIUM	N	0.55		0.003521	
CADMIUM	N	ND			
CALCIUM	NUTRIENT	266000			
CHROMIUMd	N	11.3		0.000097	
COBALT	N	4.3		0.186957	RSL
COPPER	N	9.7		0.003099	
IRON	N	11300		0.206204	
LEAD	N	7.3		0.018250	
MAGNESIUM	NUTRIENT	9780			
MANGANESE	N	269		0.144624	
MERCURY		ND			
NICKEL	N	9.5		0.006090	
POTASSIUM	NUTRIENT	3480			

Risk Additvity
Soil Analytical Data
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC533-IS-0011-062512		OTC533-SL-0001-062712		OTC533-CS-0001-092612		OTC533-CS-0002-092612	
			Sample Date	6/25/2012		6/27/2012		9/26/2012		9/26/2012	
			Location	OTC533-Station 4, leach field, OTC533-MW01		Septic tank sludge		Beneath septic tank		Beneath septic tank	
			Depth (ft bgs)	23 - 25		0 - 1		0 - 0.5		4.5 - 5	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ
METALS - continued (mg/kg)											
SELENIUM	1.4	390	391	2.5	U	**5.8**	J	NA		NA	
SILVER	1.1	390	391	0.62	U	**27**		NA		NA	
SODIUM	5200	NE	NE	**937**	J	900	U	NA		NA	
THALLIUM	1.3	0.78	0.782	1.6	U	2.1	U	NA		NA	
VANADIUM	42.6	390	391	**23.9**	J	**43**		NA		NA	
ZINC	54.6	23000	23500	**43.3**		**3120**		NA		NA	
PETROLEUM HYDROCARBONS (mg/kg)											
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	2.8	U	6.2	U	8.2	U	6.1	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	4.2	U	**371**		NA		NA	
OIL RANGE ORGANICS C28-C40	NE	NE	1000	4.2	U	**1060**		NA		NA	
CYANIDE (mg/kg)											
CYANIDE	NE	22.0	46.9	0.074	U	**0.18**	J	NA		NA	
TRITIUM (pCi/g)											
TRITIUM	NE	NE	NE	4.88	U	5.77	U	4.92	U	4.93	U

Risk Additivity Evaluation at Building 1190, Holloman AFB

0-10 ft bgs, and without sludge sample

Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
METALS - continued (mg/kg)				
SELENIUM	N	2.2		0.005626
SILVER		ND		
SODIUM	NUTRIENT	2290		
THALLIUM		ND		
VANADIUM	N	17		0.043470
ZINC	N	37.1		0.001579
PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10		ND		
DIESEL RANGE ORGANICS C10-C28	N	6.48		0.006480
OIL RANGE ORGANICS C28-C40	N	9.8		0.009800
CYANIDE (mg/kg)				
CYANIDE		ND		
TRITIUM		ND		
	SUM:		**8.2E-06**	**0.81**

Risk Additvity
Soil Analytical Data
Buidling 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

ft bgs = feet below ground surface
EPA = Environmental Protection Agency
FD = field duplicate
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NA = not analyzed
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Appendix N
Ecological Evaluation

NEW MEXICO ENVIRONMENT DEPARTMENT
SITE ASSESSMENT CHECKLIST
(From NMED (2012) Attachment A)

I. SITE LOCATION

1. Site Name: Building 1190 (OT-C533) Inactive Septic System
   US EPA I.D. Number: NM6572124422
   Location: Tularosa Basin within Holloman Air Force Base (HAFB)
   County: Otero
   City: HAFB _____ State: NM

2. Latitude: 32º 52´ 36.840˝ N Longitude: 106º 6´ 2.331˝ W

3. Attach site maps, including a topographical map, a diagram which illustrates the layout of the facility (e.g., site boundaries, structures, etc.), and maps showing all habitat areas identified in Section III of the checklist. Also, include maps which illustrate known release areas, sampling locations, and any other important features, if available.

Note: Site maps and supporting information that include (1) a Physiographic Map, (2) a Site Layout and Sampling Location Map, and (3) a Site Photo Log are generally included for all sites in the RFI reports. A site habitat map and a Google Earth photo that shows the site habitat are attached to this Site Assessment checklist.

II. SITE CHARACTERIZATION

1. Indicate the approximate area of the site (i.e., acres or sq. ft): Approximately 2 acres

2. Provide an approximate breakdown of the land uses on the site:

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	_____% Undisturbed	100% Other[c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, etc.):
_____

[b]For agricultural areas, please list the crops and/or livestock which are present:
_____

[c]For areas designated as "other", please describe the usage of the area:
Building 1190 was constructed in 1959 as a 37-foot (ft) by 73-ft structure and was demolished in 2002. The dimensions of the septic tank associated with this building were reported to be 9 ft x 4 ft x 8.8 ft, with a nominal capacity of 3,000 gallons. According to information in the Septic Tanks Report (HAFB, 2007), the building was originally used as a

change house for unconventional fuels. At the time of the survey in 1995, the building was utilized for security police operations.

3. Provide an approximate breakdown of the land uses in the area surrounding the site. Indicate the radius (in miles) of the area described: approximately 0.5 mile

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	_____% Undisturbed	~100 % Other [c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, golf course, etc.):

_____

[b]For agricultural areas, please list the crops and/or livestock which are present:

_____

[c]For areas designated as "other", please describe the usage of the area:
Habitat Map for Holloman AFB (attached) shows that habitat within 0.5 mile radius is dominated by fourwing saltbush/alkali sacaton shrubland, with areas of alkali sacaton grassland intermixed. There is also some areas to the north of the site that are shown as Development/Ground Disturbance.

4. Describe reasonable and likely future land and/or water use(s) at the site.
Land use is likely to remain the same.

5. Describe the historical uses of the site. Include information on chemical releases that may have occurred as a result of previous land uses. For each chemical release, provide information on the form of the chemical released (i.e., solid, liquid, vapor) and the known or suspected causes or mechanism of the release (i.e., spills, leaks, material disposal, dumping, explosion, etc.).

_____

Building 1190 was originally used as a change house for unconventional fuels. At the time of the survey in 1995, the building was utilized for security police operations. The building was demolished in 2002. Any releases that occurred at the site result from leaks associated with the former septic system.

6. If any movement of soil has taken place at the site, describe the degree of the disturbance. Indicate the likely source of any disturbances (e.g., erosion, agricultural, mining, industrial activities, removals, etc.) and estimate when these events occurred.

_____

Site disturbances of soil have been limited to excavation activities associated with building construction and septic system installation and septic system closure activities.

7. Describe the current uses of the site. Include information on recent (previous 5 years) disturbances or chemical releases that have occurred. For each chemical release, provide information on the form of the chemical released and the causes or mechanism of the release.

Building 1190 was demolished in 2002. The septic system at the site was abandoned in place during the RFI activities. The site is currently not being utilized

8. Identify the location or suspected location of chemical releases at the site. Provide an estimate of the distance between these locations and the areas identified in Section III.

Chemical releases that may have occurred are associated with septic system leakage.

9. Identify the suspected contaminants of concern (COCs) at the site. If known, include the maximum contaminant levels. Please indicate the source of data cited (e.g., RFI, confirmatory sampling, etc.).

As documented in the RFI, detected constituents from soil samples collected include several metals, several SVOCs (mainly PAHs), and petroleum hydrocarbons (both diesel and oil range). Additionally, samples were analyzed for VOCs, explosives, PCBs, cyanide, and tritium; however all were non-detect in soil samples from the site (for 0 to 10 feet bgs, the zone of interest for ecological receptors).

10. Identify the media (e.g., soil (surface or subsurface), surface water, air, groundwater) which are known or suspected to contain COCs.
Surface and subsurface soil, and potentially, groundwater

11. Indicate the approximate depth to groundwater (in feet below ground surface [(bgs)].

Depth to groundwater as measured from monitoring well OTC533-MW01 is 24.7 feet from top of PVC casing.

12. Indicate the direction of groundwater flow (e.g., north, southeast, etc.)

According to Figure 2-3 of the RFI report, the direction of groundwater flow at Holloman AFB has been shown to be generally from northeast to southwest. The groundwater flow direction at Building 1190 is generally to the southwest.

III. HABITAT EVALUATION

III.A Wetland Habitats

Are any wetland[1] areas such as marshes or swamps on or adjacent to the site?

☐ Yes X No

If yes, indicate the wetland area on the attached site map and answer the following questions regarding the wetland area. If more than one wetland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wetland area. Distinguish between wetland areas by using names or other designations (such as location), and clearly identify each area on the site map. Also, obtain and attach a National Wetlands Inventory Map (or maps) to illustrate each wetland area.

Identify the sources of the observations and information (e.g., National Wetland Inventory, Federal or State Agency, USGS topographic maps) used to make the determination that wetland areas are or are not present.

USGS Topographic Maps

If no wetland areas are present, proceed to Section III.B.

1Wetlands are defined in 40 CFR §232.2 as " Areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Examples of typical wetlands plants include: cattails, cordgrass, willows and cypress trees. National wetland inventory maps may be available at http:\\nwi.fws.gov. Additional information on wetland delineation criteria is also available from the Army Corps of Engineers.

Wetland Area Questions

☐ Onsite ☐ Offsite

Name or
Designation:_____

1. Indicate the approximate area of the wetland (acres or ft^2)_____

2. Identify the type(s) of vegetation present in the wetland.

   - ❑ Submergent (i.e., underwater) vegetation
   - ❑ Emergent (i.e., rooted in the water, but rising above it) vegetation
   - ❑ Floating vegetation
   - ❑ Scrub/shrub
   - ❑ Wooded
   - ❑ Other (Please describe):_____

3. Estimate the vegetation density of the wetland area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Is standing water present? ☐ Yes ☐ No

   If yes, is the water primarily: ☐ Fresh or ☐ Brackish
   Indicate the approximate area of the standing water (ft^2): _____
   Indicate the approximate depth of the standing water, if known (ft. or in.)_____

5. If known, indicate the source of the water in the wetland.

   - ❑ Stream/River/Creek/Lake/Pond
   - ❑ Flooding
   - ❑ Groundwater
   - ❑ Surface runoff

6. Is there a discharge from the facility to the wetland? ☐ Yes ☐ No

   If yes, please
   describe:_____
   _____
   _____
   _____
   _____

Wetland Area Questions (Continued)

7. Is there a discharge from the wetland? ☐ Yes ☐ No
   If yes, indicate the type of aquatic feature the wetland discharges into:

   - ❑ Surface stream/River (Name:_____)
   - ❑ Lake/Pond (Name:_____)
   - ❑ Groundwater
   - ❑ Not sure

8. Does the area show evidence of flooding? ☐ Yes ☐ No
   If yes, indicate which of the following are present (mark all that apply):

   - ❑ Standing water
   - ❑ Water-saturated soils
   - ❑ Water marks
   - ❑ Buttressing
   - ❑ Debris lines
   - ❑ Mud cracks
   - ❑ Other (Please describe):_____

9. Animals observed in the wetland area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:
   _____
   _____
   _____
   _____

III.B Aquatic Habitats

III.B.1 Non-Flowing Aquatic Features

Are any non-flowing aquatic features (such as ponds or lakes) located at or adjacent to the site?

☐ Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the non-flowing aquatic features. If more than one non-flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.B.2.

Non-Flowing Aquatic Feature Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Indicate the type of aquatic feature present:

   - ❑ Natural (e.g., pond or lake)
   - ❑ Man-made (e.g., impoundment, lagoon, canal, etc.)

2. Estimate the approximate size of the water body (in acres or sq. ft.)_____

3. If known, indicate the depth of the water body (in ft. or in.)._____

Non-Flowing Aquatic Feature Questions (Continued)

4. Indicate the general composition of the bottom substrate. Mark all sources that apply from the following list.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

☐ Other (please specify):_____

5. Indicate the source(s) of the water in the aquatic feature. Mark all sources that apply from the following list.

- ❑ River/Stream/Creek
- ❑ Groundwater
- ❑ Industrial Discharge
- ❑ Surface Runoff
- ❑ Other (please specify):_____

6. Is there a discharge from the facility to the aquatic feature? ☐ Yes ☐ No
   If yes, describe the origin of each discharge and its migration path:
   _____
   _____
   _____
   _____

7. Does the aquatic feature discharge to the surrounding environment? ☐ Yes ☐ No
   If yes, indicate the features from the following list into which the aquatic feature discharges, and indicate whether the discharge occurs onsite or offsite:

- ❑ River/Stream/Creek ☐ onsite ☐ offsite
- ❑ Groundwater ☐ onsite ☐ offsite
- ❑ Wetland ☐ onsite ☐ offsite
- ❑ Impoundment ☐ onsite ☐ offsite
- ❑ Other (please describe)_____

Non-Flowing Aquatic Feature Questions (Continued)

8. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Fish
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, turtles)
- ❑ Amphibians (e.g., frogs, salamanders)
- ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

Specify species, if known:

_____
_____
_____
_____

III.B.2 Flowing Aquatic Features

Are any flowing aquatic features (such as streams or rivers) located at or adjacent to the site?

☐ Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the flowing aquatic features. If more than one flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map

If no, proceed to Section III.C.

Flowing Aquatic Feature Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Indicate the type of flowing aquatic feature present.

   - ❑ River
   - ❑ Stream
   - ❑ Creek
   - ❑ Brook
   - ❑ Dry wash
   - ❑ Arroyo
   - ❑ Intermittent stream
   - ❑ Artificially created (ditch, etc.)
   - ❑ Other (specify)
   - ❑

2. Indicate the general composition of the bottom substrate.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

   ☐ Other (please specify):_____

3. Describe the condition of the bank (e.g., height, slope, extent of vegetative cover) of the aquatic feature.

   _____
   _____
   _____
   _____

4. Is there a discharge from the facility to the aquatic feature? ☐ Yes ☐ No
   If yes, describe the origin of each discharge and its migration path:

   _____
   _____
   _____
   _____

5. Indicate the discharge point of the water body. Specify name, if known.

   _____
   _____
   _____

Flowing Aquatic Feature Questions (Continued)

6. If the flowing aquatic feature is a dry wash or arroyo, answer the following questions.
   - ❑ Check here if feature is not a dry wash or arroyo

   If known, specify the average number of days in a year in which flowing water is present in the feature: _____

   Is standing water or mud present? Check all that apply.
   - ❑ Standing water
   - ❑ Mud
   - ❑ Neither standing water or mud

   Does the area show evidence of recent flow (e.g., flood debris clinging to vegetation)?
   - ❑ Yes
   - ❑ No
   - ❑ Not sure
7. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:

   _____
   _____
   _____
   _____

III.C Terrestrial Habitats

III.C.1 Wooded

Are any wooded areas on or adjacent to the site? ☐ Yes X No

If yes, indicate the wooded area on the attached site map and answer the following questions. If more than one wooded area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wooded area. Distinguish between wooded areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.2.

Wooded Area Questions

☐ On-site ☐ Off-site

Name or Designation:_____

1. Estimate the approximate size of the wooded area (in acres or sq. ft.)

2. Indicate the dominant type of vegetation in the wooded area.

   - ❑ Evergreen
   - ❑ Deciduous
   - ❑ Mixed

Dominant plant species, if known:_____

3. Estimate the vegetation density of the wooded area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the predominant size of the trees at the site. Use diameter at chest height.

   - ❑ 0-6 inches
   - ❑ 6-12 inches
   - ❑ >12 inches
   - ❑ No single size range is predominant

5. Animals observed in the wooded area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:_____

III.C.2 Shrub/Scrub

Are any shrub/scrub areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the shrub/scrub area on the attached site map and answer the following questions. If more than one shrub/scrub area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual shrub/scrub area. Distinguish between shrub/scrub areas, using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.3.

Shrub/Scrub Area Questions

X Onsite X Offsite

Name or Designation: Chihuahuan Desert Scrub (HAFB, 2011).
Note also: On-site areas are almost entirely gravel covered and void of habitat or vegetation with some apparent pockets of desert vegetation. Surrounding site habitat is characterized as Chihuahuan Desert. The habitat map (Figure 1) shows that habitat surrounding the site(generally to the north) is dominated by fourwing saltbush/gypsum dropseed shrubland habitat, with lesser amounts of fourwing saltbush/alkali sacaton shrubland and alkali sacaton grassland. To the south, there are areas of pickleweed shrubland and gypsum dropseed grassland habitats, then large expanses of barren alkali playa.

1. Estimate the approximate size of the shrub/scrub area (in acres or sq. ft.). Surrounding HAFB are tens of thousands of acres of Chihuahuan Desert Scrub.

2. Indicate the dominant type of shrub/scrub vegetation present, if known.

According to information provided in Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011), the area around Building 1190 (OT-C533) is dominated by Fourwing Saltbush/Alkali Sacaton Shrubland with lesser amounts of alkali sacaton grassland.

3. Estimate the vegetation density of the shrub/scrub area.

- ❑ Dense (i.e., greater than 75% vegetation)
- X Moderate (i.e., 25% to 75% vegetation)
- ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the scrub/shrub vegetation.

- ❑ 0-2 feet
- X 2-5 feet
- ❑ >5 feet

5. Animals observed in the shrub/scrub area or suspected to be present based on indirect evidence or file material:
   - X Birds
   - X Mammals
   - X Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:
   The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna

associated with the shrubland habitat potentially present in the area of Building 1190. Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam kangaroo rat *(Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus auduboni*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.3 Grassland

Are any grassland areas on or adjacent to the site? ☐ Yes X No

If yes, indicate the grassland area on the attached site map and answer the following questions. If more than one grassland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual grassland area. Distinguish between grassland areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.4.

Grassland Area Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Estimate the approximate size of the grassland area (in acres or sq. ft.)._____

2. Indicate the dominant plant type, if known.
_____
_____
_____
_____

3. Estimate the vegetation density of the grassland area.

- ❑ Dense (i.e., greater than 75% vegetation)
- ❑ Moderate (i.e., 25% to 75% vegetation)
- ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the dominant plant type (in ft. or in.)_

5. Animals observed in the grassland area or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, lizards)
- ❑ Amphibians (e.g., toads, salamanders)

Specify species, if known:

III.C.4 Desert

Are any desert areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the desert area on the attached site map and answer the following questions. If more than one desert area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual desert area. Distinguish between desert areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.5.

Desert Area Questions

X Onsite X Offsite
Name or Designation: Chihuahuan Desert

1. Estimate the approximate size of the desert area (in acres or sq. ft.).
This site including HAFB is contained within tens of thousands of acres of the Chihuahuan Desert.

2. Describe the desert area (e.g., presence or absence of vegetation, vegetation types, presence/size of rocks, sand, etc.)
Many volumes of literature have been written on the natural biota of the Chihuahuan Desert. Detailed descriptions about the biotic communities within HAFB can be found in the HAFB Integrated Natural Resource Management Plan, (HAFB, 2011). Habitats directly associated with this Site include typical desert scrub communities.

3. Animals observed in the desert area or suspected to be present based on indirect evidence or file material:

X Birds
X Mammals
X Reptiles (e.g., snakes, lizards)
☐ Amphibians (e.g., toads, salamanders)

Specify species, if known:

The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna associated with the shrubland habitat potentially present in the area of Building 1190. Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam

kangaroo rat (*Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.5 Other

1. Are there any other terrestrial communities or habitats on or adjacent to the site which were not previously described?

☐ Yes X No

If yes, indicate the "other" area(s) on the attached site map and describe the area(s) below. Distinguish between onsite and offsite areas. If no, proceed to Section III.D.

III.D Sensitive Environments and Receptors

1. Do any other potentially sensitive environmental areas[2] exist adjacent to or within 0.5 miles of the site? If yes, list these areas and provide the source(s) of information used to identify sensitive areas. *Do not answer "no" without confirmation from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

The following is taken from the Integrated Natural Resources Management Plan for HAFB (HAFB,2011). HAFB and its Geographically Separated Units (GSUs) have high biodiversity, including many sensitive species. No threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The White Sands pupfish is not Federally-listed nor has critical habitat been designated because of the multi-agency cooperative agreement to manage the species to support viable populations through habitat management and research.

Most of the sensitive species are birds that are either associated with grassland habitats on main base or with wetland habitats, primarily in the Lake Holloman Public Access Area

2 Areas that provide unique and often protected habitat for wildlife species. These areas are typically used during critical life stages such as breeding, hatching, rearing of young and overwintering. Refer to **Table 1** at the end of this document for examples of sensitive environments.

wetlands complex south of the Cantonment. Sensitive grassland and desert species at HAFB that are discussed in further detail in the management plan include:

- White Sands pupfish
- Acarospora clauzadeana lichen
- Grassland neotropical migratory birds
- Western burrowing owl
- Aplomado falcon
- Grassland raptors
- Bats
- Texas horned lizard and other reptiles

2. Are any areas on or near (i.e., within 0.5 miles) the site which are owned or used by local tribes? If yes, describe. *Contact the Tribal Liason in the Office of the Secretary (505)827-2855 to obtain this information.*

No

3. Does the site serve or potentially serve as a habitat, foraging area, or refuge by rare, threatened, endangered, candidate and/or proposed species (plants or animals), or any otherwise protected species? If yes, identify species. *This information should be obtained from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

No, based on information in the Integrated Natural Resources Management Plan, no threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The plan establishes protocols for management of sensitive desert and grassland habitats.

4. Is the site potentially used as a breeding, roosting or feeding area by migratory bird species? If yes, identify which species.

Likely not. The site has very limited viable habitat due to the disturbed nature of the site, but areas surrounding the site could potentially provide habitat for these purposes.

5. Is the site used by any ecologically[3], recreationally, or commercially important

3 Ecologically important species include populations of species which provide a critical (i.e., not replaceable) food resource for higher organisms and whose function as such would not be replaced by more tolerant species; or perform a critical ecological function (such as organic matter decomposition) and whose functions will not be replaced by other species. Ecologically important species include pest and opportunistic species that populate an area if they serve as a food source for other species, but do not include domesticated animals (e.g., pets and livestock) or plants/animals whose existence is maintained by continuous human interventions (e.g., fish hatcheries, agricultural crops, etc.,)

species? If yes, explain.

No

IV. EXPOSURE PATHWAY EVALUATION

1. Do existing data provide sufficient information on the nature, rate, and extent of contamination at the site?

   X Yes
   ❑ No
   ❑ Uncertain

   Please provide an explanation for your answer: Sample results have sufficiently characterized the site.

2. Do existing data provide sufficient information on the nature, rate, and extent of contamination in offsite affected areas?

   □ Yes
   ❑ No
   ❑ Uncertain
   X No offsite contamination

   Please provide an explanation for your answer:
   No offsite contamination is expected, and no off-site soil or groundwater samples were collected.

3. Do existing data address potential migration pathways of contaminants at the site?

X Yes
❑ No
❑ Uncertain

Please provide an explanation for your answer

While potential migration from impacted soils to groundwater might occur, no ecological exposure to groundwater is expected.

4. Do existing data address potential migration pathways of contaminants in offsite affected areas?

□ Yes
❑ No
❑ Uncertain
X No offsite contamination

Please provide an explanation for your answer:

See response to No. 3 presented previously. Also, no off-site soil contamination is expected.

5. Are there visible indications of stressed habitats or receptors on or near (i.e., within 0.5 miles) the site that may be the result of a chemical release? If yes, explain. Attach photographs if available.

No.

6. Is the location of the contamination such that receptors might be reasonably expected to come into contact with it? For soil, this means contamination in the soil 0 to 5 feet below ground surface (bgs). If yes, explain.

Yes. Some soil samples were collected in site areas where receptors might contact detected constituents.

7. Are receptors located in or using habitats where chemicals exist in air, soil, sediment or surface water? If yes, explain.

Yes. See response to No. 6 presented above.

8. Could chemicals reach receptors via groundwater? Can chemicals leach or dissolve to groundwater? Are chemicals mobile in groundwater? Does groundwater discharge into receptor habitats? If yes, explain.

No Groundwater does not discharge into receptor habitats at or near the site.

9. Could chemicals reach receptors through runoff or erosion? Answer the following questions:

What is the approximate distance from the contaminated area to the nearest watercourse or arroyo?

- ❑ 0 feet (i.e., contamination has reached a watercourse or arroyo)
- ❑ 1-10 feet
- ❑ 11-20 feet
- ❑ 21-50 feet
- ❑ 51-100 feet
- ❑ 101-200 feet
- ❑ > 200 feet
- ❑ > 500 feet
- X > 1000 feet

What is the slope of the ground in the contaminated area?

- X 0-10%
- ❑ 10-30%
- ❑ > 30%

What is the approximate amount of ground and canopy vegetative cover in the contaminated area?

- ❑ < 25%
- X 25-75%
- ❑ > 75%

Is there visible evidence of erosion (e.g., a rill or gully) in or near the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

Do any structures, pavement, or natural drainage features direct run-on flow (i.e., surface flows originating upstream or uphill from the area of concern) into the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

10. Could chemicals reach receptors through the dispersion of contaminants in air (e.g., volatilization, vapors, fugitive dust)? If yes, explain.

Yes. However, detected concentrations of constituents in soil do not generally exceeding relevant background values or ecological screening criteria (see screening assessment in main text).

11. Could chemicals reach receptors through migration of non-aqueous phase liquids (NAPLs)? Is a NAPL present at the site that might be migrating towards receptors or habitats? Could NAPL discharge contact receptors or their habitat?

No NAPLs are present at the site.

12. Could receptors be impacted by external irradiation at the site? Are gamma emitting radionuclides present at the site? Is the radionuclide contamination buried or at the surface?

No. No radionuclide contamination is expected to be present at the site.

PHOTOGRAPHIC DOCUMENTATION

During the site visit(s), photographs should be taken to document the current conditions at the site and to support the information entered in the checklist. For example, photographs may be used to document the following:

- The nature, quality, and distribution of vegetation at the site
- Receptors or evidence of receptors
- Potentially important ecological features, such as ponds and drainage ditches
- Potential exposure pathways
- Any evidence of contamination or impact

SUMMARY OF OBSERVATIONS AND SITE SETTING

Include information on significant source areas and migration pathways that are likely to constitute complete exposure pathways.

Although potentially complete exposure pathways exist (e.g. direct contact with surface soil), significant source areas are not present, as results of the screening assessment (see main text) indicate that detected concentrations of constituents in soil do not generally exceeding relevant ecological screening criteria.

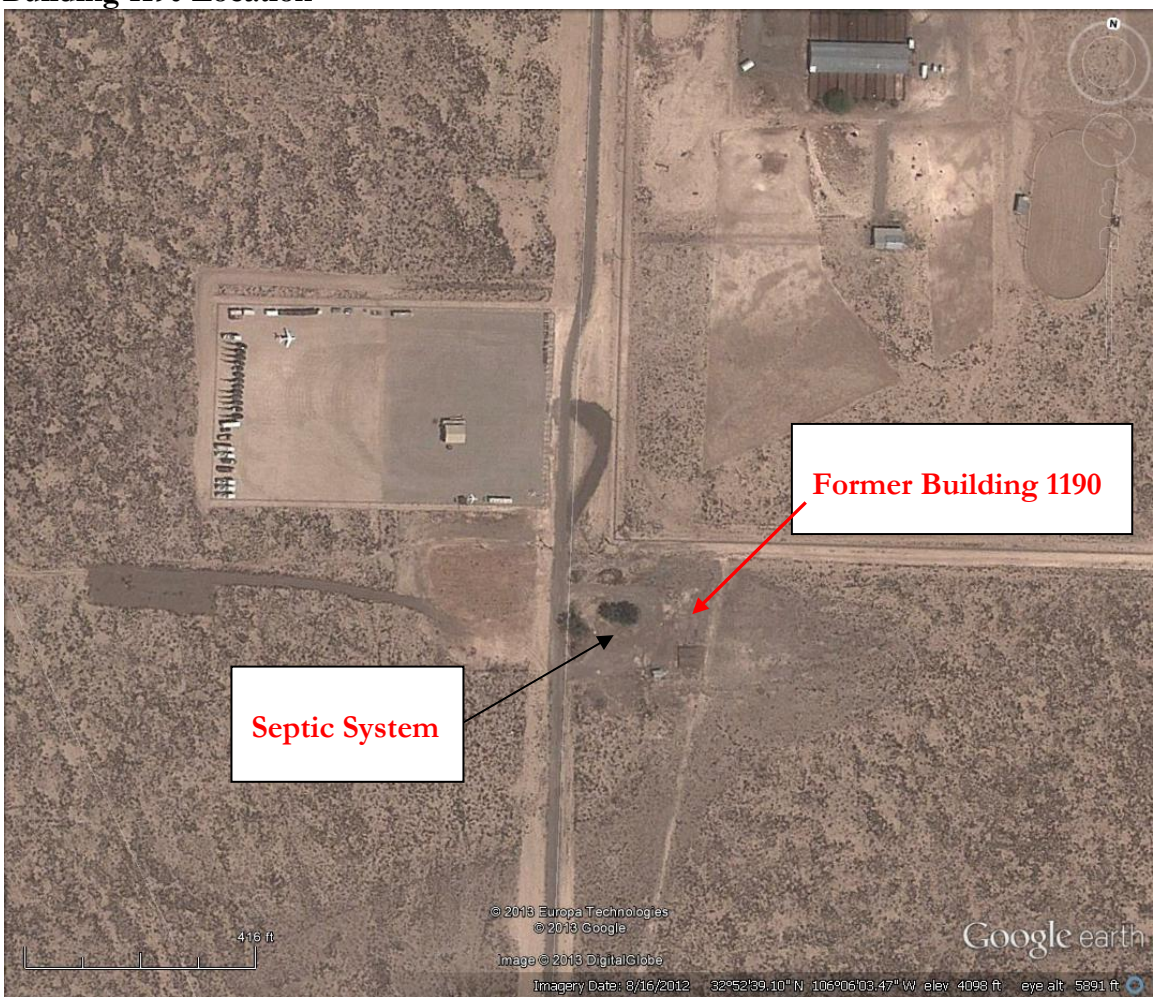
Checklist Completed by William Squire

Affiliation CB&I Federal Services, LLC.

Author Assisted by William Stanhope, CB&I Federal Services, LLC.

Date July 24, 2013

Building 1190 Location



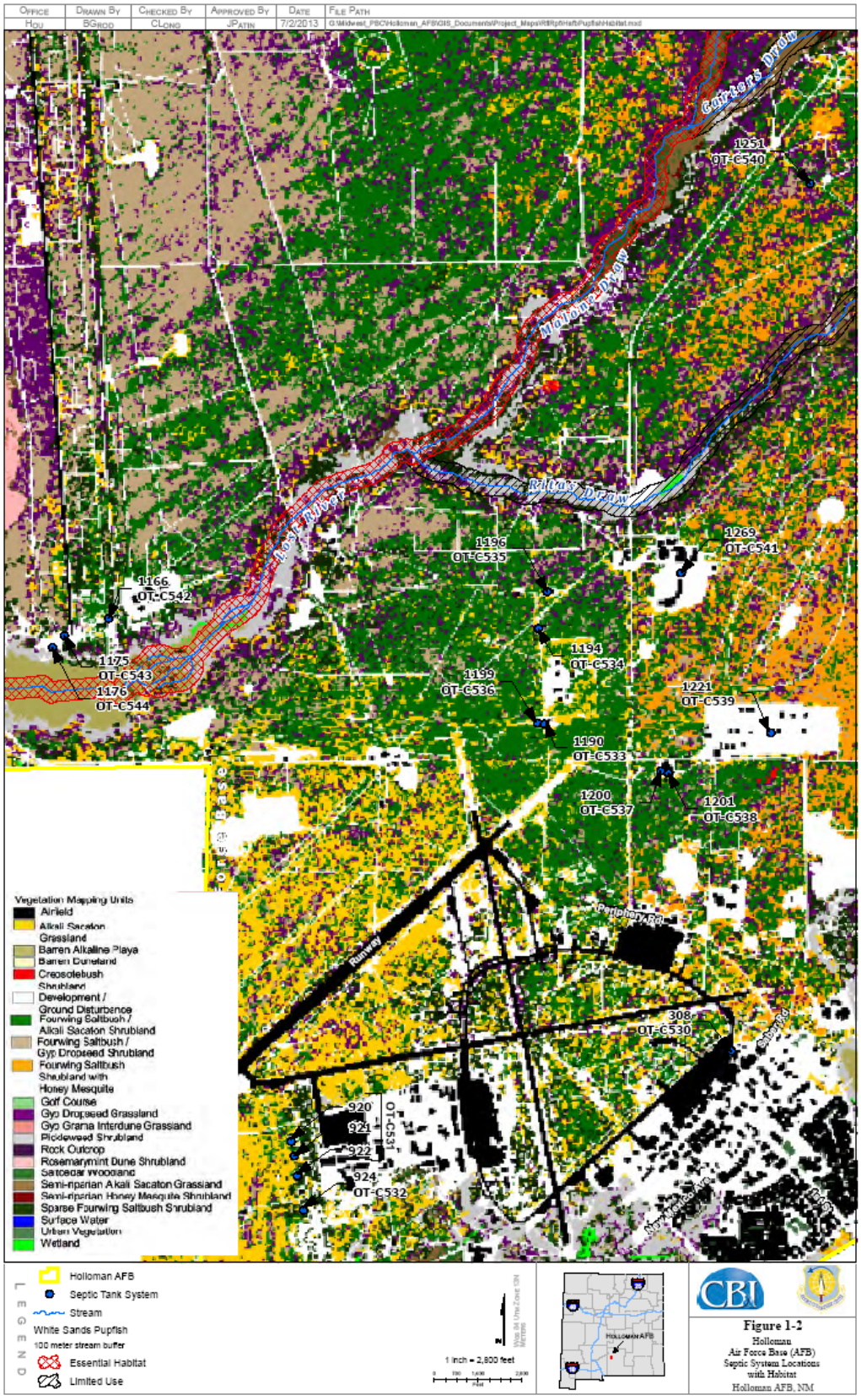


Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
with Habitat
Holloman AFB, NM

REFERENCES

Holloman Air Force Base (HAFB), 2011. *Integrated Natural Resource Management Plan*, February.

Holloman Air Force Base (HAFB), 2007. *Holloman Air Force Base Septic Tanks*, April.

New Mexico Environment Department (NMED), 2012. *Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document*, Hazardous Waste Bureau and Ground Water Quality Bureau, February, Table A-1 updated June 2012.

TABLE 1
EXAMPLES OF SENSITIVE ENVIRONMENTS

National Parks and National Monuments

Designated or Administratively Proposed Federal Wilderness Areas

National Preserves

National or State Wildlife Refuges

National Lakeshore Recreational Areas

Federal land designated for protection of natural ecosystems

State land designated for wildlife or game management

State designated Natural Areas

Federal or state designated Scenic or Wild River

All areas that provide or could potentially provide critical habitat[1] for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern

All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes

All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)

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1 Critical habitats are defined by the Endangered Species Act (50 CFR §424.02(d)) as:

> 1) Specific areas within the geographical area currently occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (ii) that may require special management considerations or protection, and 2) Specific areas outside the geographical area occupied by a species at the time it is listed upon a determination by the Secretary [of Interior] that such areas are essential for the conservation of the species.

All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)

All areas that provide or could potentially provide habitat for song birds as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-13)

All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)

All areas that provide or could potentially provide habitat for horned toads and Bullfrogs as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, resp.)

All perennial waters (e.g., rivers, lakes, playas, sloughs, ponds, etc)

All ephemeral drainage (e.g., arroyos, puddles/pools, intermittent streams, etc) that provide significant wildlife habitat or that could potentially transport contaminants off site to areas that provide wildlife habitat

All riparian habitats

All perennial and ephemeral wetlands (not limited to jurisdictional wetlands)

All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle.

ATTACHMENT B

ECOLOGICAL SITE EXCLUSION CRITERIA CHECKLIST AND DECISION TREE

1. NEW MEXICO ECOLOGICAL EXCLUSION CRITERIA CHECKLIST

The following questions are designed to be used in conjunction with the Ecological Exclusion Criteria Decision Tree (Figure 1). After answering each question, refer to the Decision Tree to determine the appropriate next step. In some cases, questions will be omitted as the user is directed to another section as indicated by the flow diagram in the Decision Tree. For example, if the user answers "yes" to Question 1 of Section I, he or she is directed to proceed to Section II.

I. Habitat

In the following questions, "affected property" refers to all property on which a release has occurred or is believed to have occurred, including off-site areas where contamination may have occurred or migrated.

1. Are any of the below-listed sensitive environments at, adjacent to, or in the locality1 of the affected property?

   - National Park or National Monument
   - Designated or administratively proposed Federal Wilderness Area
   - National Preserve
   - National or State Wildlife Refuge
   - Federal or State land designated for wildlife or game management
   - State designated Natural Areas
   - All areas that are owned or used by local tribes
   - All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle
   - All areas that provide or could potentially provide habitat for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern
   - All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes
   - All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)
   - All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)
   - All areas that provide or could potentially provide habitat for song birds as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game

1 *Locality* of the site refers to any area where an ecological receptor is likely to contact site-related chemicals. The locality of the site considers the likelihood of contamination migrating over time and places the site in the context of its general surrounding. Therefore, the locality is typically larger than the site and the areas adjacent to the site.

and Fish, 17-2-13)

- All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)
- All areas that provide or could potentially provide habitat for horned toads and bullfrogs as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, respectively)

2. Does the affected property contain land areas which were not listed in Question 1, but could be considered viable ecological habitat? The following are examples (but not a complete listing) of viable ecological habitats:

- Wooded areas
- Shrub/scrub vegetated areas
- Open fields (prairie)
- Other grassy areas
- Desert areas
- Any other areas which support wildlife and/or vegetation, excluding areas which support only opportunistic species (such as house mice, Norway rats, pigeons, etc.) that do not serve as prey to species in adjacent habitats.

The following features are <u>not</u> considered ecologically viable:

- Pavement
- Buildings
- Paved areas of roadways
- Paved/concrete equipment storage pads
- Paved manufacturing or process areas
- Other non-natural surface cover or structure

3. Does the affected property contain any perennial or ephemeral aquatic features which were not listed in Question 1?

II. Receptors

1. Is any part of the affected property used for habitat, foraging area, or refuge by any rare, threatened, or endangered species (plant *or* animal), or otherwise protected species (e.g., raptors, migratory birds)?

2. Is any part of the affected property used for habitat, foraging area, or refuge by any species used as a recreational (e.g., game animals) and/or commercial resource?

3. Is any part of the affected property used for habitat, foraging area, or refuge by any plant or animal species? This includes plants considered "weeds" and opportunistic insect and animal species (such as cockroaches and rats) if they are used as a food source for other species in the area.

III. Exposure Pathways

1. Could receptors be impacted by contaminants via direct contact?

   Is a receptor located in or using an area where it could contact contaminated air, soil3, or surface water?

For Questions 2 and 3, note that one must answer "yes" to all three bullets in order to be directed to the "exclusion denied" box of the decision tree. This is because answering "no" to one of the questions in the bullet list indicates that a complete exposure pathway is not present. For example, in Question 2, if the chemical cannot leach or dissolve to groundwater (bullet 1), there is no chance of ecological receptors being exposed to the chemical through contact with contaminated groundwater. Similarly, the responses to the questions in Question 4 determine whether a complete pathway exists for exposure to NAPL.

2. Could receptors contact contaminants via groundwater?
   - Can the chemical leach or dissolve to groundwater4?
   - Can groundwater mobilize the chemical?
   - Could (does) contaminated groundwater discharge into known or potential receptor habitats?

3. Could receptors contact contaminants via runoff (i.e., surface water and/or suspended sediment) or erosion by water or wind?
   - Are chemicals present in surface soils?
   - Can the chemical be leached from or eroded with surface soils?
   - Is there a receptor habitat located downgradient of the leached/eroded surface soil?

---

3 For soil, this means contamination less than 5 feet below ground surface (bgs).

4 Information on the environmental fate of specific chemicals can be found on the Internet at *http://www.epa.gov/opptintr/chemfact/* or at a local library in published copies of the *Hazardous Substances Data Bank*.

4. Could receptors contact contaminants via migration of non-aqueous phase liquids (NAPL)?

- Is NAPL present at the site?
- Is NAPL migrating toward potential receptors or habitats?
- Could NAPL discharge impact receptors or habitats?

Figure 1 -Ecological Exclusion Criteria Decision Tree

(Refer to corresponding checklist for the full text of each question)

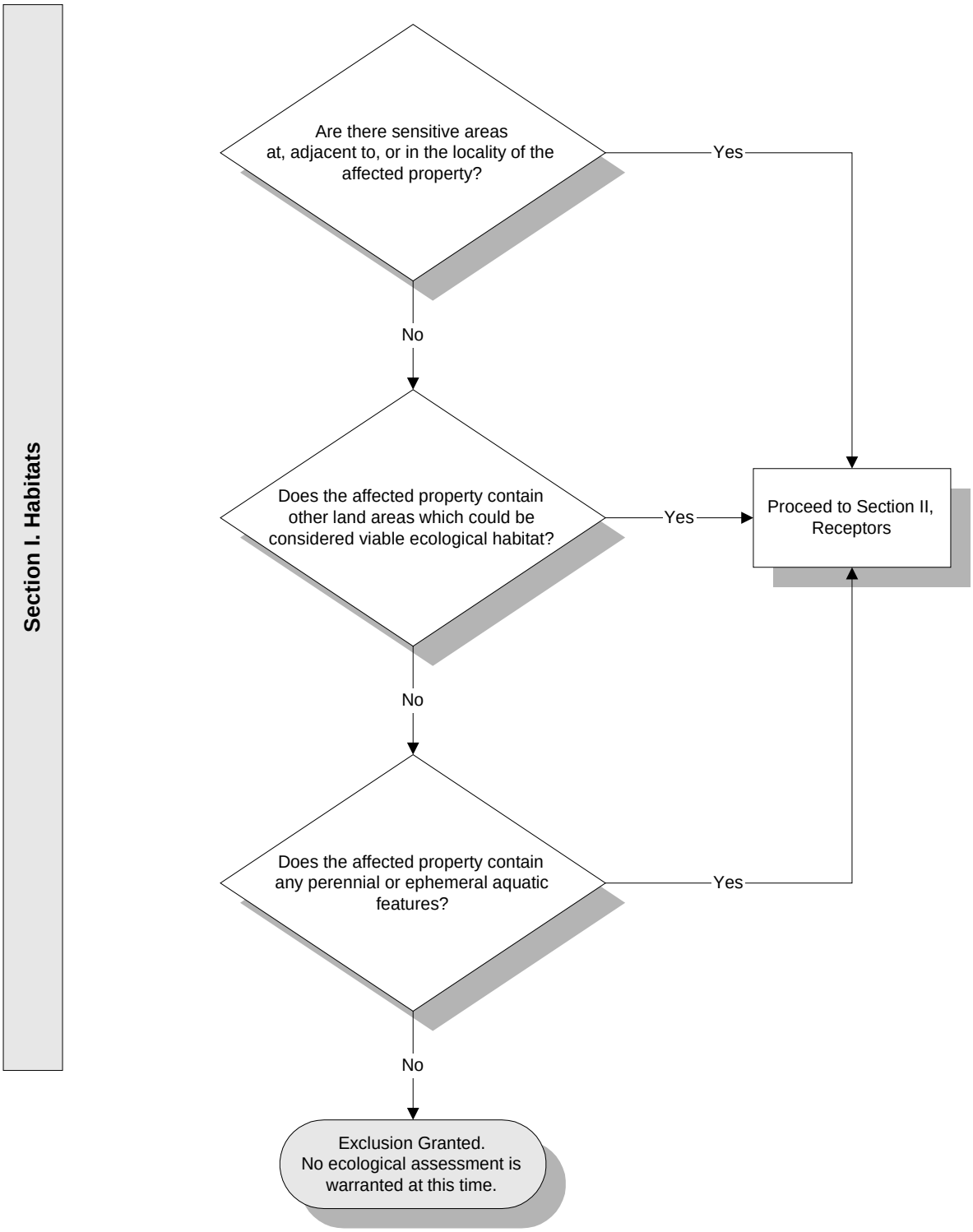


Figure 1 - Exclusion Criteria Decision Tree (continued)

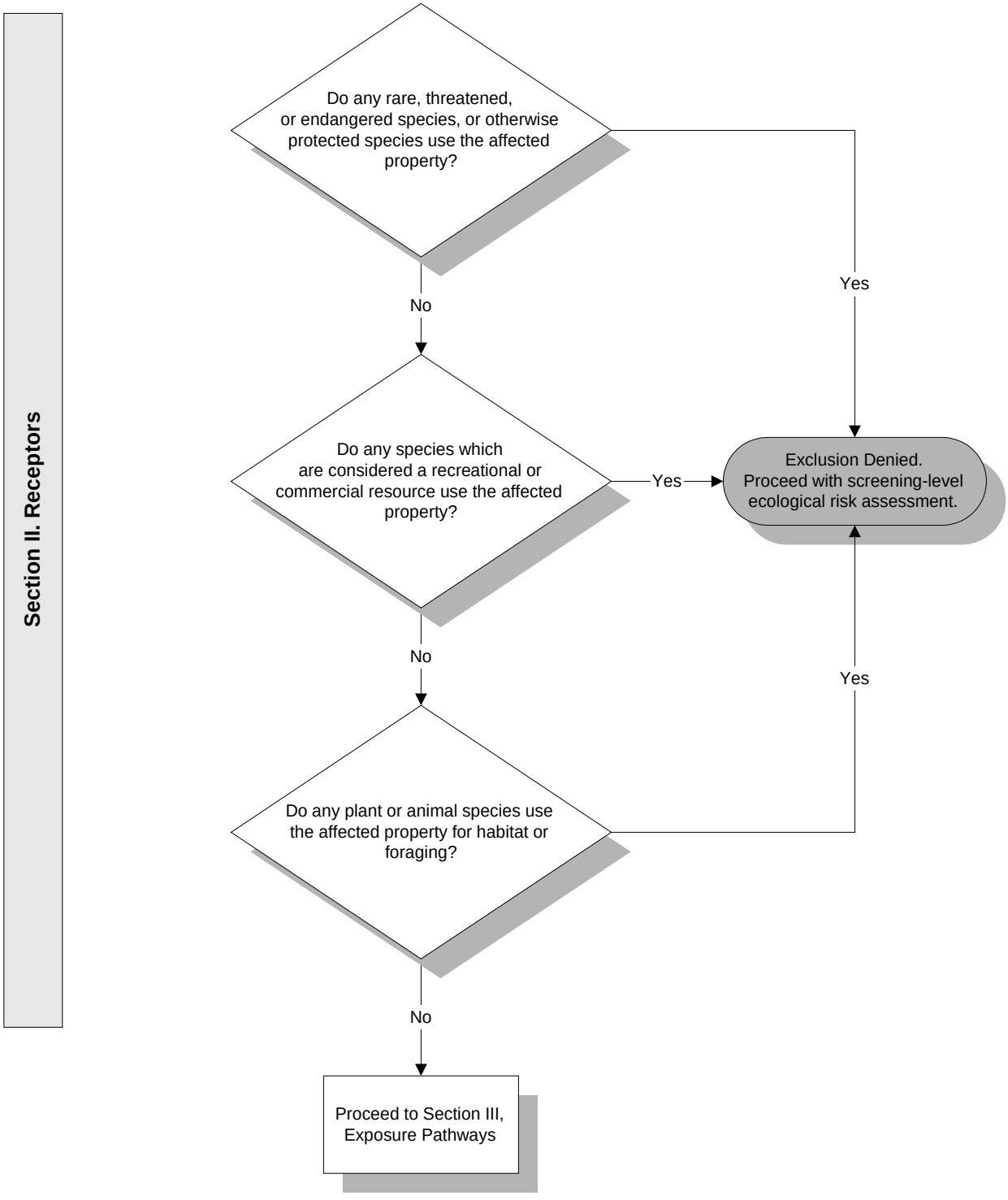
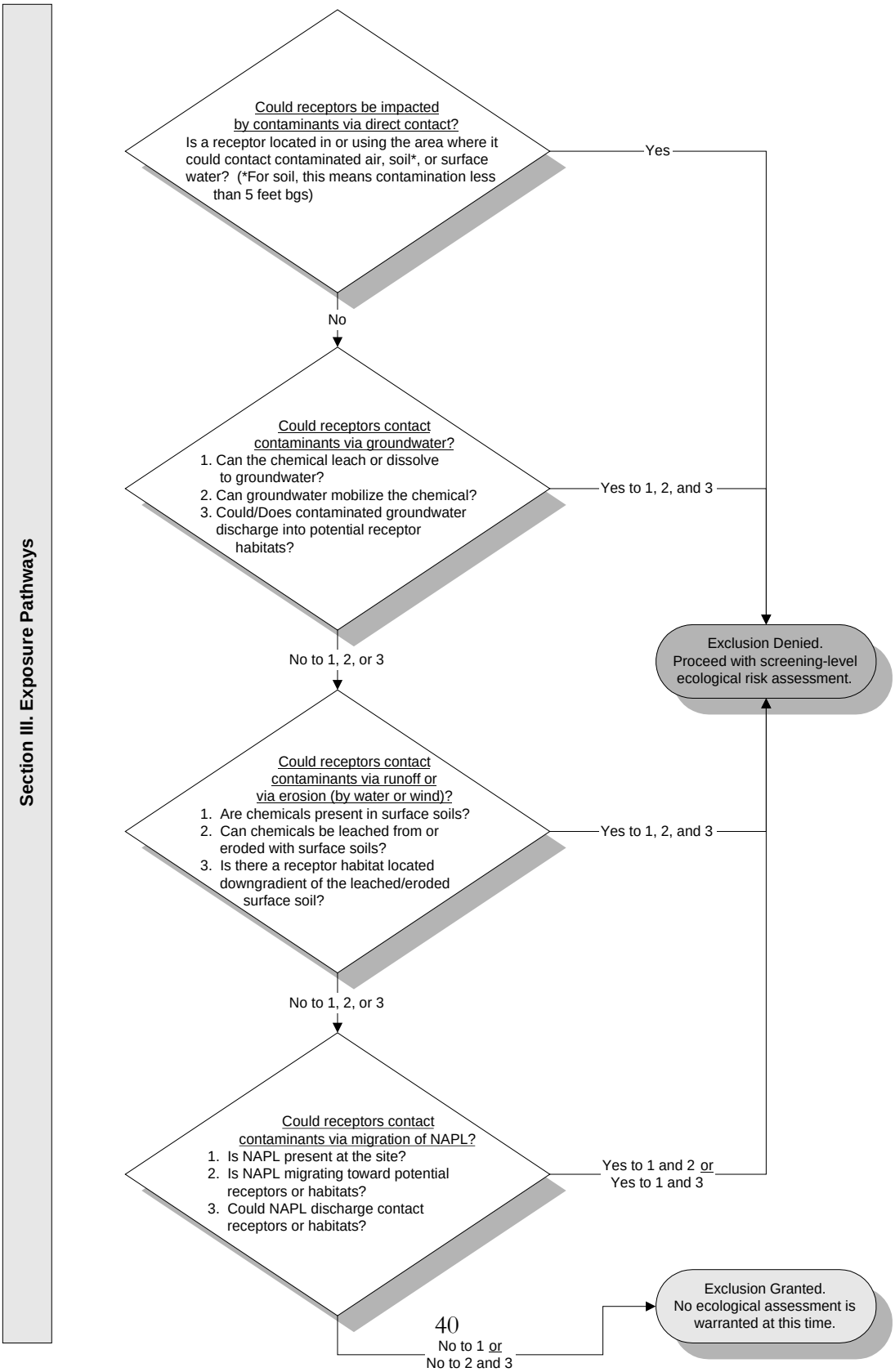


Figure 1 - Exclusion Criteria Decision Tree (continued)



bis(2-Ethylhexyl) phthalate (mg/kg)	d_bis(2-Ethylhexyl) phthalate (mg/kg)	Selenium (mg/kg)	d_Selenium (mg/kg)
0.076	0	2.2	1
0.087	0	2.5	0
0.087	0	3.5	0
0.075	0	1.5	0
0.262	1		
0.4	0		

1				General UCL Statistics for Data Sets with Non-Detects								
2			User Selected Options									
3			From File	input.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	bis(2-Ethylhexyl) phthalate (mg/kg)											
10												
11						General Statistics						
12						Number of Valid Data	6	Number of Detected Data	1			
13						Number of Distinct Detected Data	1	Number of Non-Detect Data	5			
14								Percent Non-Detects	83.33%			
15												
16						Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!						
17						It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).						
18												
19						The data set for variable bis(2-Ethylhexyl) phthalate (mg/kg) was not processed!						
20												
21												
22												
23	Selenium (mg/kg)											
24												
25						General Statistics						
26						Number of Valid Data	4	Number of Detected Data	1			
27						Number of Distinct Detected Data	1	Number of Non-Detect Data	3			
28								Percent Non-Detects	75.00%			
29												
30						Warning: This data set only has 4 observations!						
31						Data set is too small to compute reliable and meaningful statistics and estimates!						
32						The data set for variable Selenium (mg/kg) was not processed!						
33												
34						It is suggested to collect at least 8 to 10 observations before using these statistical methods!						
35						If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.						
36												
37												

CAS	Total	Detects	FOD	Mindet	Maximum concentration of defects	minnd	maxnd	arithmean	arithsd	cvnorm	geomean	geostd	estmnln	eststdln	sw95	swnorm	swln	sf95	sfnorm	sfln	distributio
bis(2-Ethylhexyl) phthalate	6	1	16.67%		0.262	0.075	0.4	0.104083	0.100278	0.963443	0.07217	2.460686	0.108247	0.121009	0.788	0.717	0.727				U
Selenium	4	1	25.00%		2.2	1.5	3.5	1.4875	0.626332	0.421063	1.378345	1.595917	1.537469	0.759794	0.748	0.992	0.966				N*

Median	95uclnorm	sdln	h	95uclln	95uclnp	95quantno	95quantln	95quantnp	utl95norm	utl95ln	quant95np	Units	cohenmnn	cohenstdn	cohenmnlr	cohenstdln	aitchmnno	aithcstdno	aitchmnln	aitchstdln	poisspl	Pathway	BootStrap	AMQ at 0.95%
0.087	0.186576	0.90044	3.797457	0.499501	0.262	0.269041	0.317425	0.262	0.476216	2.039688	0.262	mg/kg										4	0.173072	
3	2.224493	0.467448	3.500775	3.954806	2.2	2.517816	2.973786	2.2	4.709351	15.26309	2.2	mg/kg										4	2.200061	

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

Analyte		Sample Number	OTC533-IS-0001-062512		OTC533-IS-0005-062512		OTC533-IS-0008-062512		OTC533-IS-0010-062512		OTC533-CS-0001-092612		OTC533-CS-0002-092612	
		Sample Date	6/25/2012		6/25/2012		6/25/2012		6/25/2012		9/26/2012		9/26/2012	
		Location	OTC533-Station 1, septic tank influent line		OTC533-Station 3, septic tank effluent line		OTC533-Station 4, leach field, OTC533-MW01		OTC533-Station 4, leach field, OTC533-MW01		Beneath septic tank		Beneath septic tank	
		Depth (ft bgs)	3 - 5		3 - 5		3 - 5		0 - 2		0 - 0.5		4.5 - 5	
	Background Values - Soil (mg/kg)[a]	LANL (2012) ESLs (mg/kg)[b]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	**88**		**75.3**		**76**		**88.6**					
SEMIVOLATILES (mg/kg)														
BENZO(A)ANTHRACENE	NE	0.8 / 8	0.019	U	0.022	U	0.022	U	0.019	U	**0.0309**	J	0.2	U
BENZO(A)PYRENE	NE	53 / 170	0.019	U	0.022	U	0.022	U	0.019	U	**0.0238**	J	0.2	U
BENZO(B)FLUORANTHENE	NE	18 / 180	0.019	U	0.022	U	0.022	U	0.019	U	**0.0257**	J	0.2	U
BENZO(K)FLUORANTHENE	NE	62 / 620	0.019	U	0.022	U	0.022	U	0.019	U	**0.0257**	J	0.2	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	0.02 / 0.2	0.076	U	0.087	U	0.087	U	0.075	U	0.262	J	0.4	U
CHRYSENE	NE	2.4 / 24	0.019	U	0.022	U	0.022	U	0.019	U	**0.0332**	J	0.2	U
FLUORANTHENE	NE	10 / 23	0.019	U	0.022	U	0.022	U	0.019	U	**0.037**	J	0.2	U
PYRENE	NE	10 / 20	0.019	U	0.022	U	0.022	U	0.019	U	**0.0339**	J	0.2	U
METALS (mg/kg)														
ALUMINUM	13722	pH Dependent	**5980**	J	**681**		**1150**		**12800**		NA		NA	
ARSENIC	3.7	6.8 / 68	**2.4**	J	1.3	U	**1.1**	J	**2.4**	J	NA		NA	
BARIUM	169.3	110 / 260	**77.1**	J	**15**	J	**21.8**	J	**91**		NA		NA	
BERYLLIUM	1.6	2.5 / 25	0.45	U	0.63	U	0.44	U	**0.55**	J	NA		NA	
CALCIUM	317332	NSV	**210000**		**219000**		**266000**		**143000**		NA		NA	
CHROMIUM	25	28 / 280	**5.4**	J	**0.8**	J	**1.3**	J	**11.3**		NA		NA	
COBALT	7.7	13 / 130	**2.6**	J	0.63	U	**0.51**	J	**4.3**	J	NA		NA	
COPPER	13	15 / 46	**5.1**	J	**1.4**	J	**2**	J	**9.7**		NA		NA	
IRON	23049	NSV	**5660**	J	**564**		**884**		**11300**		NA		NA	
LEAD	10.9	14 / 28	**4.5**	J	0.63	U	0.88	U	**7.3**	J	NA		NA	
MAGNESIUM	16991	NSV	**2540**		**1460**	J	**1180**	J	**9780**		NA		NA	
MANGANESE	393	220 / 1,100	**123**		**11.7**		**17.2**		**269**		NA		NA	
NICKEL	17.4	9.7 / 19	**5.2**	J	**1**	J	**1.1**	J	**9.5**	J	NA		NA	
POTASSIUM	5077	NSV	**1590**	J	320	U	**367**	J	**3480**	J	NA		NA	
SELENIUM	1.4	0.52 / 3.4	2.2	J	2.5	U	3.5	U	1.5	U	NA		NA	
SODIUM	5200	NSV	500	U	700	U	480	U	**2290**	J	NA		NA	
VANADIUM	42.6	0.025 / 0.25	12.3	J	2.8	J	3	J	17	J	NA		NA	
ZINC	54.6	48 / 480	**16.9**		3.2	U	4.4	U	**37.1**		NA		NA	
PETROLEUM HYDROCARBONS (mg/kg)														
DIESEL RANGE ORGANICS C10-C28	NE	NE	**6.48**	J	4.4	U	4.4	U	3.7	U	NA		NA	
OIL RANGE ORGANICS C28-C40	NE	NE	**9.8**		4.4	U	4.4	U	3.7	U	NA		NA	

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1190 (OT-C533) RFI Report
Holloman Air Force Base, New Mexico

LANL (2012) ESL values represented as: No-Effect ESL / Low-Effect ESL (e.g., 10 / 20 for pyrene)

LANL (2012) ESL Exceeded

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] Los Alamos National Laboratory (LANL), 2012, ECORISK Database, LA-UR-12-24548, Release 3.1, October.

ft bgs = feet below ground surface
EPA = Environmental Protection Agency
FD = field duplicate
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NA = not analyzed
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Final

RCRA Facility Investigation Report
Group 1 – Building 1196 (OT-C535)
Holloman Air Force Base, New Mexico

Prepared for U.S. Air Force Civil Engineer Center
2261 Hughes Ave., Suite 155
Lackland Air Force Base, Texas 78236-9861

Prepared by Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

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Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)

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Acronyms and Abbreviations

AFB	Air Force Base
bgs	below ground surface
COPC	constituent of potential concern
DPT	direct push technology
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
ft	foot/feet
GPR	ground-penetrating radar
GRO	gasoline range organics
HI	hazard index
IDW	investigation-derived waste
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MCL	maximum contaminant level
MDL	method detection limit
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
ORO	oil range organics
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RSL	Regional Screening Level
Shaw	Shaw Environmental & Infrastructure, Inc. (A CB&I Company)
SLERA	screening-level ecological risk assessment
SSL	soil screening level
SVOC	semivolatile organic compound
TAL	target analyte list
TDS	total dissolved solids
TPH	total petroleum hydrocarbons
VOC	volatile organic compound
WQS	water quality standards

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1.0 INTRODUCTION

Shaw Environmental & Infrastructure, Inc. (Shaw), a CB&I company, prepared this Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for the Air Force Civil Engineer Center (formerly the Air Force Center for Engineering and the Environment) under Contract No. FA8903-09-D-8580, Task Order No. 0013, Modification 01. Results presented in this report are from the investigation of the abandoned septic tank located at Building 1196 (OT-C535) at Holloman Air Force Base (AFB), New Mexico, which was one of the fifteen Group 1 septic tank sites under the Midwestern Region Performance-Based Remediation Contract. This RFI Report has been prepared pursuant to the requirements of the Holloman AFB Hazardous Waste Facility RCRA Permit No. NM6572124422 (the Permit) (New Mexico Environment Department [NMED], 2004). The purpose of this RFI was to delineate potential contamination that may have been released to the environment from the Building 1196 septic tank system.

Holloman AFB is situated in south-central New Mexico in the northwest central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). The 15 Group 1 former septic tank sites are located throughout Holloman AFB (Figure 1-2). Each former septic tank is associated with a specific building and is named in reference to the building, along with a numerical identification. As such, the 15 Group 1 septic tank systems are the following: OT-C530 (Building 308), OT-C531 (Buildings 920, 921, and 922), OT-C532 (Building 924), OT-C533 (Building 1190), OT-C534 (Building 1194), OT-C535 (Building 1196), OT-C536 (Building 1199), OT-C537 (Building 1200), OT-C538 (Building 1201), OT-C539 (Building 1221), OT-C540 (Building 1251), OT-C541 (Building 1269), OT-C542 (Building 1166), OT-C543 (Building 1175), and OT-C544 (Building 1176). This report presents a summary of the RFI work conducted at abandoned septic tank OT-C535 at Building 1196.

Building 1196 was constructed in 1956 and originally used for missile assembly. It was later converted to a communications equipment storage facility. The *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) report in Appendix A indicates that the building contained a toilet, urinal, and lavatory which discharged to the sewer system. There were no floor drains at Building 1196. The septic tank was abandoned in place in January 2008 by opening the tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill (North Wind Inc., 2008).

1.1 Purpose of the Investigation

Investigative activities were undertaken at Holloman AFB to determine the nature and extent of contamination, and propose recommendations for either closure or additional corrective

action, if necessary, at fifteen inactive, abandoned or removed septic tank systems, following the general guidance for closing septic systems found in 20.7.3.307 New Mexico Administrative Code (NMAC) Standards – Abandoned Sewers and On-Site Liquid Waste Systems.

Project quality objectives for each septic tank site consisted of the following:

- Gather and review all site historical information
- Identify septic tank components and historical uses
- Remove septic tank contents and contaminated soil (where necessary), and abandon the tank (where necessary)
- Determine the nature and extent of residual constituents of concern at each site, including potential pathways to groundwater
- Evaluate the risk at each site
- Develop conclusions and recommendations for each site.

This RFI Report presents the data collected to meet these project quality objectives at the Building 1196 abandoned septic tank.

1.2 Scope of Activities

This RFI Report describes all activities associated with the septic tank investigation at Building 1196, including site layout, soil sampling, soil analysis, as-built pipe mapping, and site boundary survey. All work was performed in accordance with the *Basewide Septic Tank Solid Waste Management Units RFI Work Plan* (USACE, 2010) and the *Quality Program Plan* (Shaw, 2012a). The *Quality Program Plan* contains the Site Safety and Health Plan; the Uniform Federal Policy–Sampling and Analysis Plan/Quality Assurance Project Plan; and the Construction Quality Plan, which defines the methodology and practices that were used to control construction work during the performance of the RFI.

1.3 Regulatory Setting

The Permit (NMED, 2004) established the general and specific standards and activities for managing hazardous waste pursuant to Subtitle C of RCRA, the New Mexico Hazardous Waste Act, and the New Mexico Hazardous Waste Management Regulations. The Permit also set forth requirements for investigation, notification, corrective action, and reporting for the storage, management, and releases of hazardous wastes.

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The 15 septic systems were either inactive, abandoned, or previously removed, as indicated in *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) report (Appendix A), and were not listed in the Permit (NMED, 2004). The Holloman AFB *RFI Work Plan* (USACE, 2010) was approved by NMED in a letter dated January 13, 2010 (NMED, 2010). The NMED-approved *RFI Work Plan* (USACE, 2010) contained investigation activities only; therefore, Shaw submitted the Group 1 *Final Voluntary Corrective Measures Request – Septic Tanks Sites* (Shaw, 2012b) to include remediation and closure tasks that addressed septic system abandonment using 20.7.3.307 NMAC (Abandoned Sewers and On-Site Liquid Waste Systems). NMED has primary regulatory responsibility for the septic system sites; therefore corrective action must be performed under Title 20 NMAC.

The septic tank investigations were based on action/cleanup levels stipulated in Appendix 4-F of the Permit to be protective of human health and the environment. Permit Appendix 4-F specifies that soil contaminant concentrations be compared with the NMED residential soil screening levels (SSL), as presented in the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012), or the U.S. Environmental Protection Agency (EPA) Regional Screening Levels (RSLs) if no NMED SSL has been established (EPA, 2012a). Holloman AFB also has NMED-approved background concentrations for metals in soil (NMED, 2012b).

For groundwater, the Permit specifies that the more stringent of either the New Mexico Water Quality Control Commission (NMWQCC) water quality standards (WQS) (20.6.2 NMAC), or the EPA drinking water maximum contaminant levels (MCLs), be used for comparison with measured sample concentrations (EPA, 2012b).

1.4 RFI Report Organization

This RFI Report is organized into the following sections:

- **Section 1.0 - Introduction**: identifies the objectives and purpose of this report.
- **Section 2.0 - Environmental Setting**: provides pertinent descriptions of history, location, physiography, topography, surface water, hydrology, regional geology, soil types, regional hydrogeology, climate, current and future land use, and current and future water use for Holloman AFB.
- **Section 3.0 - Source Characterization**: describes the data collection techniques and locations, as well as analytical methods.

- **Section 4.0 - Investigation Results and Evaluation**: presents the soil and groundwater analytical results, summarizes the geochemical evaluation, and provides the results of the human health risk and ecological evaluations.

- **Section 5.0 - Data Quality Assurance and Data Quality Control Review**: summarizes the analytical data validation results.

- **Section 6.0 - Conclusions and Recommendations**: presents the conclusions and recommendations of this RFI report.

- **Section 7.0 - References**: lists the references cited in this report.

In addition to the figures and tables listed in the table of contents, the following appendices are included in this report:

- **Appendix A** – Historical Records
- **Appendix B** – Photographic Log
- **Appendix C** – Geophysical Report
- **Appendix D** – Sample Collection Logs
- **Appendix E** – Boring Logs
- **Appendix F** – Site Survey Data
- **Appendix G** – Laboratory Analytical Data and Data Validation Checklists
- **Appendix H** – Waste Manifests
- **Appendix I** – Geochemical Evaluation
- **Appendix J –** Risk Evaluation Calculations
- **Appendix K –** Ecological Evaluation.

2.0 ENVIRONMENTAL SETTING

This section provides background information for Holloman AFB including physical setting, history, topography, climate, soils, geology, hydrology, and land and water use.

2.1 Physical Setting

Holloman AFB is situated in south-central New Mexico, in the northwest-central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). Holloman AFB has a population of 6,000, and occupies 59,639 acres in the northeast quarter of Section 1, Township 17 South, Range 8 East. The White Sands Missile Range testing facilities occupy additional land extending northward from the base. Privately- and publicly-owned lands border the remainder of Holloman AFB. The major highway servicing Holloman AFB is Highway 70, which runs southwest from the town of Alamogordo, New Mexico, and separates Holloman AFB from publicly owned lands to the south. Alamogordo, New Mexico, which has a population of 30,401 according to the 2010 U.S. Census, is located approximately 7 miles east of the base.

2.2 Holloman Air Force Base History

Holloman AFB was first established in 1942 as Alamogordo Army Air Field. From 1942 through 1945, Alamogordo Army Air Field served as the training grounds for over 20 different flight groups, flying primarily B-17s, B-24s, and B-29s. After World War II, most operations had ceased at the base. In 1947, Air Material Command announced the air field would be its primary site for the testing and development of unmanned aircraft, guided missiles, and other research programs. On January 13, 1948, the Alamogordo installation was renamed in honor of the late Colonel George V. Holloman, a pioneer in guided missile research. In 1968, the 49th Tactical Fighter Wing arrived at Holloman AFB, and has remained since. Today, Holloman AFB also serves as the training center for the German Air Force's Tactical Training Center.

2.3 Physiography and Topography

Holloman AFB is located within the Sacramento Mountains physiographic province on the western edge of the Sacramento Mountains. The base is approximately 59,600 acres in area, and is located at a mean elevation of 4,093 feet (ft) above mean sea level. The region is characterized by high tablelands with rolling summit plains; cuesta-formed mountains dipping eastward; and west-facing escarpments, with the wide bracketed basin forming the basin and range complex. Holloman AFB is located in the Tularosa Basin, which is part of the Central Closed Basins. The bordering mountains rise abruptly to altitudes of 7,000 to 12,000 ft above mean sea level. The San Andres Mountains bound the basin to the west

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(approximately 30 miles) with the Sacramento Mountains approximately 10 miles to the east (Figure 2-1). At its widest, the basin is approximately 60 miles east to west, and stretches approximately 150 miles north to south.

2.4 Climate

As a whole, New Mexico has a mild, arid to semiarid continental climate characterized by light precipitation totals, abundant sunshine, relatively low humidity, and relatively large annual and diurnal temperature ranges (Western Regional Climate Center, 2013). The climate of the Central Closed Basins varies with elevation. The base is located in the low areas and is characterized by warm temperatures and dry air. Daytime temperatures often exceed 100 degrees Fahrenheit in the summer months, and are in the middle 50s (degrees Fahrenheit) in the winter. A preponderance of clear skies and relatively low humidity permits rapid nighttime cooling resulting in average diurnal temperature ranges of 25 to 35 degrees Fahrenheit. Potential evapotranspiration, at 67 inches per year, significantly exceeds annual precipitation, usually less than 15 inches. Arid conditions resulting from very low rainfall amounts, coupled with the topographically induced wind patterns combining with the sparse vegetation, tend to cause localized “dust devils.” The annual rainfall for Alamogordo, New Mexico is 12 inches per year. Much of the precipitation falls during the midsummer monsoonal period (July and August) as brief, yet frequent, intense thunderstorms culminating in 30 to 40 percent of the total annual rainfall.

2.5 Regional Geology and Soils

2.5.1 Geology

The sedimentary rocks that make up the adjacent mountain ranges are between 250 and 500 million years old (New Mexico Bureau of Geology and Mineral Resources, 2012). During the period when the area was submerged beneath the shallow intracontinental sea, the layers of limestone, shale, gypsum, and sandstone were formed. In time, these layers were pushed upward through various tectonic forces forming a large bulge on the surface. Approximately 10 million years ago, the center began to subside resulting in a vertical drop of thousands of feet, leaving the edges still standing (the present-day Sacramento and San Andres mountain ranges). In the millions of years following, rainfall, snowmelt, and wind eroded the mountain sediments depositing them in the valley (i.e., Tularosa Basin). Water carrying eroded limestone, dolomite, gravel, and other materials continue to flow into the basin.

As the Tularosa Basin is a bolson, which is a basin with no surface drainage outlet, sediments carried by surface water into a closed basin are bolson deposits. The overlying alluvium generally consists of unconsolidated gravels, sands, and clays. Soils in the basin are derived from the adjacent ranges as erosional deposits of limestone, dolomite, and gypsum. A fining

sequence from the ranges towards the basin's center characterizes the area with the near-surface soils as alluvial, eolian, and lacustrine deposits. The alluvial fan deposits are laterally discontinuous units of interbedded sand, silt, and clay while the eolian deposits consist primarily of gypsum sands. The eolian and alluvial deposits are usually indistinguishable due to the reworking of the alluvial sediment by eolian processes. The playa, or lacustrine deposits, consist of clay containing gypsum and are contiguous with the alluvial fan and eolian deposits throughout the base. Stiff caliche layers, varying in thickness, have been identified at different areas of the base.

2.5.2 Soils

The U.S. Natural Resources Conservation Service (formerly the Soil Conservation Service) has identified two soil associations in the vicinity of Holloman AFB: (1) the Holloman-Gypsum Land-Yesum Complex, and (2) the Mead silty clay loam (Figure 2-2) (U.S. Department of Agriculture, 1981). The permeability of these horizons ranges from 4×10^{-4} to 1×10^{-3} centimeters per second.

The Holloman-Gypsum Land-Yesum Complex, 0 to 5 percent sloped soil, consists of larger areas of shallow and deep, well-drained soils and areas of exposed gypsum. The Holloman soil makes up approximately 35 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 13 inches of the substratum is pink, very fine sandy loam that is very high in gypsum. Below that, the substratum is white gypsum to a depth of more than 60 inches. This soil is calcareous and mildly alkaline to moderately alkaline. Permeability is moderate. Available water capacity is very low.

Gypsum Land makes up approximately 30 percent of the Holloman-Gypsum Land-Yesum Complex (0 to 5 percent slopes). Typically, less than 1 inch of very fine sandy loam overlies soft to hard, white gypsum. The deep Yesum consists of very fine sandy loam that makes up approximately 20 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 9 inches of the substratum is light brown, fine sandy loam that is very high in gypsum. Below that, the substratum is pink, very fine sandy loam to a depth of more than 60 inches. The soil is calcareous throughout, and is mildly alkaline. Permeability is moderate. Available water capacity is moderate. Many fine gypsum crystals are found throughout the profile.

The soil type found across the main drainage area for the installation is Mead silty clay loam, 0 to 1 percent slopes. This deep, poorly drained, nearly level soil is on outer fringes of alluvial fans. This soil formed in fine textured alluvium over lacustrine lake sediment. It is very high in salt content because of periodic flooding and poor drainage. Slopes are smooth and concave. Typically, the surface layer is reddish brown, silty clay loam, and clay loam

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approximately 5 inches thick. The substratum, to a depth of 48 inches, is light reddish brown clay that has a high content of salt. Below that, the substratum is lacustrine material of variable texture and color to a depth of more than 60 inches. Included within this soil are areas of Holloman soils and Gypsum Land along the margins of the unit of steep, short gully sides and knolls. These inclusions make up approximately 15 percent of the map unit for this soil type. Individual areas are generally smaller than 10 acres. This soil is moderately calcareous throughout and is moderately to strongly alkaline. It has a layer of salt that is more soluble than gypsum. Permeability is very low. Available water capacity is low (USACE, 2010).

2.6 Regional Hydrogeology

Groundwater occurs as an unconfined aquifer in the unconsolidated deposits of the central basin, with the primary source of recharge as rainfall percolation and minor amounts of stream runoff along the western edge of the Sacramento Mountains. Surface water/rainfall migrates downward into the alluvial sediments at the edge of the shallow aquifer near the ranges and flows through progressively finer-grained sediments towards the central basin. Because the Tularosa Basin is a closed system, water that enters the area leaves either through evaporation or percolation. This elevated amount of percolation results in a fairly high water table. Beneath Holloman AFB, groundwater ranges from 5 to 50 ft below ground surface (bgs). Flow for the base is generally towards the southwest with localized influences from the variations in the topography of the base (Figure 2-3). In the northern and western portions of the base, groundwater flows more to the west towards the Ritas Draw, Malone Draw, and Lost River drainages. Groundwater flow is affected by local topography in areas immediately adjacent to arroyos, where groundwater flows directly toward the drainages regardless of the regional flow pattern.

Groundwater in the Tularosa Basin is of potable quality at the recharge areas in close proximity to the Sacramento Mountains and becomes increasingly mineralized toward the central portion of the basin and discharge areas. The majority (over 70 percent) of the Environmental Restoration Program sites located across Holloman AFB have groundwater monitoring wells containing water with an average total dissolved solids (TDS) concentration greater than 10,000 milligrams per liter (mg/L). These TDS data support the hypothesis that TDS concentrations below 10,000 mg/L at Holloman AFB are caused by dilution of natural groundwater quality from leaking water lines and surface irrigation from the domestic water supply. TDS concentrations greater than 10,000 mg/L exceed the NMWQCC limit as potable water (20.6.2 NMAC), and thus, the groundwater beneath Holloman AFB has been designated as unfit for human consumption. Likewise, the EPA guidelines have identified the groundwater as a Class IIIB water source, characterized by TDS concentrations exceeding 10,000 mg/L, and is characterized by a low degree of

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interconnection with adjacent surface water or groundwater of a higher class. Groundwater does not discharge or connect to any adjacent aquifers, because the Tularosa Basin is a closed basin. Adjacent surface waters include Lost River and Lake Holloman, which also have high concentrations of TDS, and are not considered potential drinking water sources.

2.7 Surface Water and Hydrology

The Tularosa Basin contains all of the surface flow in its boundaries. The nearest inflow of surface waters to Holloman AFB comes from the Lost River, located in the north-central region of the base. The upper reaches of the Three Rivers and the Sacramento River are perennial in the basin. Holloman AFB is dissected by several southwest-trending arroyos that control the surface drainage. Hay Draw arroyo is located in the far north. Malone and Ritas Draws, which drain into the Lost River and Dillard Draw arroyos, are located along the eastern perimeter of the base. Approximately 10,000 years ago, indications are that a much wetter climate existed. The present-day Lake Otero encompassed a much larger area, possibly upwards of several hundred square miles. Its remains are the Alkali Flat and Lake Lucero. Lake Lucero is a temporary feature of merely a few inches in depth during the rainy season.

Ancient lakes and streams deposited water-bearing deposits over the older bedrock basement materials. Fractures, cracks, and fissures in the Permian and Pennsylvanian bedrock yield small quantities of relatively good-quality water in the deeper peripheral. Potable water is only found from wells near the edges of the basin, with more saline water towards the center. Two of the principal sources of potable water are: (1) a long narrow area on the upslope sides of Tularosa and Alamogordo, and (2) in the far southwestern part of the basin. A portion of the city of Alamogordo's water, as well as Holloman AFB's water, is supplied from Bonito Lake (which is in the Pecos River Basin).

2.8 Current and Future Land Use

The land surrounding Holloman AFB consists of residential areas to the east and northeast (city of Alamogordo), rangeland to the south, the White Sands National Monument to the west, and areas where military activities are conducted to the north. The desert terrain of the area immediately surrounding Holloman AFB has limited development, and there are no agricultural operations, residential communities, or large industrial operations located adjacent to the base. The Boles Well Field, a freshwater source for Holloman AFB, is located approximately 6 miles to the southeast of the base. Holloman AFB is an active military installation and is expected to remain active for the foreseeable future. No transfer of military property to the public is anticipated, and public access to the base is restricted. Future land use is not expected to differ significantly from current land use practices (Foster Wheeler Environmental Corporation, 2002).

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2.9 Current and Future Water Use

At present, Holloman AFB receives approximately 50 percent of its freshwater supply from the Boles Well Field. An additional freshwater resource for Holloman AFB, and for the city of Alamogordo, is Bonito Lake, located 60 miles northeast of the Tularosa Basin. Currently, there are no potable supplies of groundwater or surface water located on the base because of poor groundwater quality with TDS concentrations greater than 10,000 mg/L.

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3.0 SOURCE CHARACTERIZATION

This section presents the overall technical approach in general accordance with the *RFI Work Plan* (USACE, 2010) (except where otherwise noted), and details the investigative and remediation activities that were implemented at Building 1196.

The primary environmental media of concern at Building 1196 are soil and groundwater. The extent of contamination in soil was expected to be relatively local to the abandoned septic tank location. Therefore, the basic approach was to identify the abandoned septic tank location and then sample at the individual features of the septic tank system in characterizing the soil. To evaluate the potential impacts to groundwater, a monitoring well was planned for installation in at the downgradient end of the leach field, but groundwater was not encountered during soil boring at the planned well location. The analytical programs for both soil focused on the expected nature of contamination likely to be associated with septic tank discharges.

The RFI conducted at abandoned septic tank OT-C535 (Building 1196) was initiated as part of the Midwestern Region Performance-Based Remediation Contract. The *RFI Work Plan* (USACE, 2010) for this site included the following field work activities: pre-mobilization and mobilization/site setup activities, soil boring advancement, soil sample collection, monitoring well installation and development, groundwater sample collection, sample analysis, investigation-derived waste (IDW) management, and land surveying. Appendix B is a photographic log of the septic system layout at Building 1196.

3.1 Pre-mobilization/Mobilization Activities

Several pre-investigation documents were filed and approvals obtained, as follows:

- Civil Engineer Work Request (Air Force Form 332) approval
- Base digging permits (Air Force Form 103, Base Civil Engineering Work Clearance Request) with utility clearances
- Site security clearances
- Facility manager notification of the intended operations.

Prior to the start of activities, a pre-investigation kick-off meeting and site walk-through were conducted with the Air Force Civil Engineer Center resident engineer, Holloman AFB personnel, and Shaw's Construction Manager, to plan for equipment access, equipment staging, decontamination area layout, potential site hazards, emergency evacuation routes, and project schedule.

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Prior to the submittal of the base digging permits, the drilling locations were delineated using marker flags, stakes, and paint. Utility clearance approvals were completed by the appropriate Holloman AFB utility office (i.e., telephone, sewer, water, natural gas, etc.), and by the New Mexico One Call utility clearance system. Upon receipt of the approved digging permit and utility clearances, Shaw's Construction Manager completed a site walk-through to confirm the utility and intrusive work locations. In addition, Shaw performed a site survey prior to the start of drilling activities to search for signs of other buried or overhead utilities.

3.2 Geophysical Investigation

A geophysical investigation was performed at Building 1196 in an attempt to define the limits of the abandoned septic system. Methods employed included: visual inspection, electromagnetic induction conductivity detection, ground-penetrating radar (GPR), and electromagnetic pipe and cable location.

Electromagnetic Induction Conductivity Detection ground induction methods are employed to detect broad metal mass anomalies or conductive zones that may be indicative of potential septic tanks, and lateral changes in conductive zones of soil or backfill materials relative to native soil. GPR is used to detect abandoned septic tank excavation sidewalls and fill areas. An Electromagnetic Pipe and Cable Survey was conducted to detect buried utility lines.

Electromagnetic and GPR surveys were conducted at Building 1196 in June 2012. The location of the abandoned septic tank was identified, approximately 40 ft north of Building 1196. Underground utility lines, the septic tank influent line, the septic tank effluent line, and the septic tank leach field were also delineated for later reference during soil boring activities. The locations of the individual leach field piping could not be directly detected by the geophysical survey due to the similarity of composition of the clay pipes and the surrounding soil. However, the leach field could be identified by the geophysical survey equipment due to the differences in mineralization and conductivity between the native soil and the soils that were physically affected by normal leach field operation. The presence of the leach field piping was assumed within the leach field as identified by the geophysical survey which allowed for representative soil and groundwater sample collection. Geophysical findings are shown on Figure 3-1. The complete geophysical report is included in Appendix C.

3.3 Soil Investigation

The soil investigation of the abandoned septic tank at Building 1196 was conducted on June 28, 2012. The program consisted of sampling four borings advanced at the abandoned septic tank location, as shown on Figure 3-1. Soil boring OT-C535-Station 1 (sample numbers OTC535-IS-0001-062812 and OTC535-IS-0002-062812) was placed south of the

abandoned septic tank near the influent line, OT-C535-Station 2 (sample numbers OTC535-IS-0003-062812 and OTC535-IS-0004-062812) was placed at the abandoned septic tank location, OT-C535-Station 3 (samples numbers OTC535-IS-0005-062812 and OTC535-IS-0006-062812) was placed north of the abandoned septic tank near the effluent line, and OT-C535-Station 4 (sample numbers OTC535-IS-0007-062812, OTC535-IS-0008-062812-FD, and OTC535-IS-0009-062812) was placed in the leach field of the abandoned septic tank. All borings were advanced using direct push technology (DPT), with soil samples collected at depths of 3 to 5 ft and 10 to 12 ft at OT-C535-Station 1; and 7 to 9 ft and 14 to 16 ft at OT-C535-Station 2; 3 to 5 ft and 10 to 12 ft at OT-C535-Station 3; and 3 to 5 ft and 10 to 12 ft at OT-C535-Station 4 (Appendix D contains copies of the sample collection logs). A field duplicate was collected from the 3 to 5 ft depth at OT-C535-Station 4.

Soil samples were logged in the field in accordance with the Unified Soil Classification System requirements, and sample depths were in general accordance with the *RFI Work Plan* (USACE, 2010). Soil samples were not screened with a photoionization detector since there was no sensory evidence of contamination. Appendix E has copies of the soil boring logs.

Soil samples for volatile organic compound (VOC) analysis were collected in accordance with EPA Method 5035, using a TerraCore® Sampler device (EPA, 1986), while non-VOC sample aliquots were placed in laboratory-provided containers. Samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), explosives, polychlorinated biphenyls (PCBs), target analyte list (TAL) metals, total petroleum hydrocarbons (TPH)-gasoline range organics (GRO), TPH-diesel range organics (DRO), TPH-oil range organics (ORO), cyanide, percent solids, and tritium by Accutest Laboratories, Inc., a National Environmental Laboratory Accreditation Program-accredited laboratory, using EPA analytical methods, as summarized on Table 3-1.

The excess sample core soil extracted using the DPT drilling method was placed in 55-gallon drums for later characterization and transport to a licensed disposal facility. The boreholes were abandoned upon completion by plugging from the bottom of the borehole to ground surface using bentonite pellets, then patched with cement to match the surrounding land surface contour. The soil borings were then covered with gravel to match the surrounding land surface contour. Soil boring equipment was decontaminated between borings as detailed in Holloman AFB Standard Operating Procedure 2, “Sampling Equipment Decontamination” as provided in Appendix B of the *RFI Work Plan* (USACE, 2010) and Shaw’s Standard Operating Procedure No. EI-FS-014, “Decontamination of Contact Sampling Equipment.”

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3.4 Groundwater Investigation

Groundwater was not present in the soil boring drilled at Building 1196 Station 4 in the septic leach field - the planned location for monitoring well installation. As a result, a monitoring well was not installed and groundwater sampling was not performed.

3.5 Investigation-Derived Waste

The nonhazardous IDW generated during the Building 1196 (OT-C535) RFI were segregated into the following categories:

- Soil – drill cuttings soil
- Water – decontamination liquids.

Upon generation, investigation-derived waste was properly containerized and temporarily stored at the designated laydown yard, as specified by Holloman AFB. Wastes were contained in sealed, U.S. Department of Transportation–approved, steel 55-gallon drums (for soil cuttings and decontamination water), roll-off containers with liners and covers (for excavated waste soil), and a 1,400-gallon plastic tank (for waste water). The waste soil drums were emptied into 20-cubic yard roll-off containers, and the waste water was pumped into a bulk plastic tank prior to characterization sampling and analysis for disposal. The drill cuttings from the Building 1196 Site were placed into the 20-cubic-yard roll-off containers along with soils from other Holloman AFB investigation sites.

3.6 Site Surveying

Soil borings and other site features shown on Figure 3-1 were surveyed by Albuquerque Surveying Company, Inc. from Albuquerque, New Mexico, a state-licensed surveyor.

Horizontal coordinates are referenced to the North American Datum, 1983 State Plane Coordinate System, New Mexico-Central, and surveyed to an accuracy of $\pm$1.0 ft. Vertical elevations are referenced to the North American Vertical Datum 1988 coordinate system to an accuracy of $\pm$0.01 ft. A copy of the survey results is presented in Appendix F.

3.7 Decontamination Procedures

A decontamination pad was constructed at the designated laydown area for decontamination of all downhole drilling equipment. The drilling rig was decontaminated prior to entering the site. Drilling equipment that came into contact with the borehole was decontaminated by hot-water pressure washing. Disposable equipment used for soil sample collection did not require decontamination.

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4.0 INVESTIGATION RESULTS AND EVALUATION

Soil analytical results presented in this section were used to delineate constituents of concern that may have been released to the environment, and confirm that no additional remedial measures are required.

4.1 Soil Analytical Results

DPT soil boring samples were collected during the Building 1196 RFI, at the locations shown on Figure 3-1. All soil samples were sent to Accutest Laboratories, Inc., for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium analyses. Analytical results for the soil samples are presented in Table 4-1. Laboratory analytical data packages, and the data validation checklists for the soil sample data, are provided in Appendix G.

The analytical results for metals in Table 4-1 show that Holloman AFB soil samples contain significant amounts of calcium, typically greater than 100,000 milligrams per kilogram (mg/kg) (10 percent), and can be as high as 250,000 mg/kg (25 percent). Calcium at these levels contributes spectral interferences during inductively-coupled plasma metals analysis, and can also clog the nebulizer that is used to introduce the sample. Sample dilution is the recommended method for solving both the spectral interference issue and the nebulizer clogging issue. However, sample dilution raises the analytical method detection limits (MDLs) for all associated metals, including thallium.

A typical method detection limit for thallium during inductively-coupled plasma analysis is 0.13 mg/kg. Diluting by a factor of 5 to 20 to eliminate calcium spectral interference and nebulizer clogging causes the thallium detection limit to be elevated by a factor of 5 to 20. This results in a MDL that is above the NMED residential SSL of 0.782 mg/kg thallium. Consequently, the required remedy to allow for proper equipment operation resulted in MDLs that were above the NMED residential SSL. However, thallium is not an element that is anticipated to be present at Building 1196 as a result of normal septic tank operation and maintenance.

The validated soil analytical results were compared with the NMED SSLs (NMED, 2012a), or the EPA RSLs (EPA, 2012a), if an NMED residential SSL was not available for a given analyte. In addition, a TPH screening level of 1,000 milligrams per kilogram (mg/kg) was used to evaluate the laboratory analytical data. The 1,000 mg/kg action level for petroleum-contaminated soil is the Residential Direct Exposure Limit for unknown oil, listed in Table 6-2, TPH Screening Guidelines for Potable Groundwater, of the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a).

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The arsenic detection in USTC535-IS-0004-062812 (OT-C535-Station 2, 14 to 16 ft bgs) exceeded the NMED residential SSL; however, this exceedance is considered to be the result of natural processes as discussed below in Section 4.4. No other parameters had detections above the NMED residential SSL screening criteria in sample USTC535-IS-0004-062812, and all other samples met the NMED SSL criteria for all analytes. Likewise, all soil samples from all locations and depths had TPH-GRO, TPH-DRO, and TPH-ORO concentrations below the TPH screening level, and no tritium was detected in any of the soil samples.

Two samples reported several metals detections exceeding their respective Holloman AFB soil background values, as follows:

Sample Number	Depth (ft bgs)	Metal	Result (mg/kg)	Background (mg/kg)
OTC535-IS-0004-062812	14-16	Aluminum	19,100	13,722
		Cobalt	11.9	7.7
		Lead	11.6	10.9
		Manganese	464	393
		Nickel	24	17.4
		Zinc	54.8	54.6
OTC535-IS-0009-062812	10-12	Aluminum	21,700	13,722
		Barium	178	169.3
		Cobalt	7.9	7.7
		Lead	13	10.9
		Nickel	18.4	17.4
		Sodium	5,520	5,196
		Zinc	54.7	54.6

4.2 Groundwater Analytical Results

A soil boring was drilled in the Building 1196 septic tank leach field (Station 4), with the objective of installing a groundwater monitoring well. However, groundwater was not encountered. As a result, the monitoring well was not installed and groundwater sampling was not performed. The ephemeral nature of shallow groundwater at Building 1196 was observed at numerous other sites during the Holloman AFB RFIs, and lends uncertainty as to the reliability of the shallow groundwater (upper water table) as a water source. Furthermore, as stated in Section 3.2.4.2 of the *RFI Work Plan* (USACE, 2010), groundwater may not require testing if it is determined that limited impacts to the soil column have been

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realized from the septic tanks leach field. As discussed in Section 4.4, arsenic was the only parameter detected in soil above NMED residential SSL, and is most likely natural.

4.3 Investigation Derived Waste Analytical Results

A bulk waste characterization sample (LDY-IDW-01-090412) was collected from the bulk waste soil and analyzed for Toxicity Characteristic Leaching Procedure VOCs, SVOCs, and RCRA metals. The results are presented in Table 4-2. None of the waste soil analytical results were above the 40 Code of Federal Regulations Part 261.24 limits. The waste soil was managed as nonhazardous waste and was subsequently transported to Otero/Greentree Regional Landfill, Alamogordo, New Mexico for disposal (Waste Manifest in Appendix H).

The wastewater from equipment decontamination was sampled and analyzed for VOCs, SVOCs, TAL metals, TPH-GRO, TPH-DRO, and TPH-ORO, with the analytical results presented in Table 4-3. The analytical results were reviewed by the Holloman AFB wastewater treatment plant personnel, and subsequently accepted for disposal.

4.4 Geochemical Evaluation of Arsenic in Soil

This section summarizes the geochemical evaluation of soil arsenic concentrations from the Building 1196 site at Holloman Air Force Base (Appendix I contains the detailed evaluation). The nine soil samples considered in this evaluation were obtained in June 2012 at a several depth intervals ranging from 3 to 5 ft to 14 to 16 ft bgs. All of the samples were analyzed for the full suite of 23 TAL metals. Arsenic is evaluated because the NMED residential SSL of 3.9 mg/kg for arsenic was exceeded in sample OTC535-IS-0004-062812 (14 to16 ft bgs) which had a concentration of 10.3 mg/kg.

Analyses of 42 background subsurface samples were used for comparison in the evaluation. These background samples were obtained from depths of 7 to 30 ft bgs at intervals that were above the water table. Descriptions of the background samples can be found in the *Basewide Background Study Report for Holloman Air Force Base* (Nation View Bhate, 2009).

4.4.1 Geochemical Evaluation Results

Aluminum and iron are evaluated first to verify that the iron concentrations are natural and suitable for use as reference elements for the evaluation of arsenic.

4.4.1.1 Aluminum and Iron

Aluminum has a mean concentration of 8,500 mg/kg in the nine site samples, and has a considerable range from 1,770 to 21,700 mg/kg. Aluminum is a primary component of common soil-forming minerals such as clays, feldspars, and micas. Aluminum is always trivalent (as Al^{3+}) and can substitute for ferric iron (Fe^{3+}) in iron oxide minerals. It can also adsorb on iron oxide surfaces (Cornell and Schwertmann, 2003).

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Iron has a mean concentration of 8,200 mg/kg in the site samples and a similar range of 1,410 to 21,800 mg/kg. It is dominantly present as iron oxides. Iron oxides are common soil-forming minerals and occur as discrete mineral grains or as coatings on silicate minerals (Cornell and Schwertmann, 2003).

Clays and iron oxides tend to exist as very fine particles, so both aluminum (a proxy for clay content) and iron (a proxy for iron oxide content) are enriched in samples with finer grain sizes. The geochemical evaluation indicated that the site and background samples have similar Fe/Al ratios. It also showed that the site samples do not contain excess aluminum or iron from a contaminant source, and that their aluminum and iron concentrations are natural.

Iron is used as the reference element for arsenic so these results also indicate that the observed iron concentrations are suitable for use in evaluating the arsenic source in the site samples. Clays and iron oxides have an affinity to adsorb specific trace elements, so as a result, samples that are enriched in these minerals are expected to contain naturally high concentrations of trace elements, including arsenic.

4.4.1.2 Arsenic

Arsenic is known to associate with iron oxide minerals, as discussed in Appendix I. A soil sample that is naturally enriched in iron oxides is expected to be naturally enriched in arsenic. A ratio plot of the arsenic and iron results (provided in Appendix I) reveals that the Building 1196 samples have As/Fe ratios that fall within the range of the background ratios. The consistent As/Fe ratios in the site samples, and the agreement with the background ratios indicates that the observed arsenic concentrations are most likely natural. Appendix I contains the detailed geochemical evaluation.

Iron concentrations in the Holloman AFB background samples range from 470 to 20,000 mg/kg (NationView Bhate, 2009). The maximum iron concentration was obtained from sample OTC535-IS-0004-062812 having an iron concentration of 21,800 mg/k, which is greater than range determined in the Holloman AFB background study (NationView Bhate, 2009). The natural enrichment of iron in this site sample (OTC535-IS-0004-062812) is the probable reason for the elevated arsenic.

4.5 Risk-Based Evaluation

4.5.1 Soil

Nine soil samples were collected at Building 1196, from depths of 0 to 16 ft bgs, during the abandoned septic tank investigation. Per NMED (2012), the soil depths of interest for a risk evaluation are 0 to 10 ft bgs for construction workers and residential receptors, and 0 to 1 ft bgs for commercial/industrial workers. Therefore, results from the screening assessment (Table 4-1) that present data for 0 to 10 ft bgs were used for the Risk Evaluation. Based on

the results of the initial screening evaluation for 0 to 10 ft bgs soil, no constituents of potential concern (COPC) have a concentration greater than NMED residential SSLs or the EPA RSLs (if NMED values have not been established). Total cancer risk ratios and total hazard ratios (hazard index [HI]) to address potential additive toxicological effects were also assessed (per NMED 2012a, Section 5.0). This was conducted by using maximum detected concentrations of carcinogens and non-carcinogens, estimating risk and hazard ratios, and scaling a total cancer risk and total HI. The total cancer risk did not exceed 1.0×10^{-5} (total cancer risk: 5.6×10^{-6}), as shown in Appendix J. The total HI based on maximum detected concentrations was equal to 0.35 (Appendix J). As the target HI is 1.0, this is acceptable because the HI does not exceed 1.0.

Arsenic was detected in one sample at a concentration (10.3 mg/kg) that exceeded the NMED residential SSL (3.9 mg/kg), but the sample was collected at a depth of 14-16 ft bgs. A shallower co-located sample collected at a depth of 7 to 9 ft bgs had an arsenic concentration below the screening value.

Therefore, there are no constituents of potential concern (COPC) in soil and future residential, current and future commercial/industrial worker, and current and future construction worker exposure scenarios are not health risks.

4.5.2 Groundwater

A soil boring was drilled in the Building 1196 septic tank leach field (Station 4), with the objective of installing a groundwater monitoring well. However, groundwater was not encountered. As a result, the monitoring well was not installed, groundwater was not sampled, and a human health risk evaluation was not performed.

4.5.3 Risk-Based Conclusions

No COPCs were selected for soil; therefore, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure are not health risks. Additionally, total cancer risks and non-cancer hazards in soil were acceptable.

4.6 Ecological Evaluation

The former septic system at Building 1196 was located in a graveled, flat-lying area that served as the parking lot for the building and is now sparsely to moderately vegetated, as shown in the photographic log in Appendix B. A screening-level ecological risk assessment (SLERA) Scoping Assessment Site Assessment Checklist was completed for the Building 1196 (OT-C535) septic tank system and is included in Appendix K. Results of the checklist Exclusion Criteria Decision Tree indicate that the site is a potential viable

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ecological habitat and a potential exposure pathway exists for soil; therefore, the SLERA was performed.

Soil data results from 0 to 10 ft bgs were included in the comparison and are provided in Table A of Appendix K. According to NMED (2012c), this is the potential depth of interest for wildlife, including burrowing animals. As shown on Table A (Appendix K), five soil samples were available within the 0 to 10 ft bgs zone. Detected constituents in soil included 16 metals. All other constituents analyzed for were non-detected.

Metals concentrations were compared to Holloman AFB soil background values as show in in Table A of Appendix K. Detected concentrations of metals did not exceed Holloman soil background values in any soil sample evaluated. Therefore, no further evaluation was performed for metals.

Since all detected site concentrations for metals are below their respective background screening values, it is concluded that risks to the ecological system at and surrounding the site are acceptable.

5.0 DATA QUALITY ASSURANCE AND DATA QUALITY CONTROL REVIEW

All analytical data was reviewed in accordance with EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA, 2004a) and the EPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (EPA, 2004b). Data qualifiers were added to the database prior to project use. The data tables provided in Section 4.0 show the data qualifiers added during data validation. Detailed data validation checklists for each data deliverable are provided in Appendix G.

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6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary and Conclusions

6.1.1 Soil

Nine soil samples were collected at various Holloman AFB Building 1196 locations during the abandoned septic tank investigation. The samples were analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, total cyanide, percent solids, and tritium. Validated analytical results were compared with the NMED residential SSLs, the NMED Residential Direct Exposure Limit for soil contaminated with unknown petroleum oil, and the Holloman AFB soil background values.

No samples from the 0 to 10 ft bgs zone had constituent concentrations that exceeded the New Mexico residential SSLs or the Holloman AFB soil background values. The only parameter that exceeded the New Mexico residential SSLs was arsenic in one sample, at a depth where human health exposure is not expected. A shallower co-located sample had an arsenic concentration below the screening value. In addition, a geochemical evaluation of the arsenic results concluded that the observed arsenic concentrations are most likely natural. No TPH was detected above 1,000 mg/kg and no tritium was detected in any of the soil samples from any depth or location.

Risk-based health screening was not performed since no COPCs were identified in soil. The ecological evaluation concluded that since all detected concentrations for metals were below their respective background screening values, potential risks to the ecological system at the site are acceptable.

6.1.2 Groundwater

A soil boring was drilled in the Building 1196 septic tank leach field (Station 4), with the objective of installing a groundwater monitoring well. However, groundwater was not encountered. As a result, the monitoring well was not installed, groundwater was not sampled, and a risk-based health screening was not performed.

6.2 Recommendations

6.2.1 Soil

No COPCs were detected in soil above the NMED residential SSLs criteria and potential risk to ecological receptors was determined to be acceptable. Therefore, no additional corrective action is recommended for soil at Building 1196.

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6.2.2 Groundwater

Groundwater was not encountered during the Building 1196 investigation. Therefore, no action is needed for groundwater at Building 1196.

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Tables

Table 3-1
Sample Summary
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Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C535-Station 1	687047.4644	1686384.1096	6/28/2012	Investigation Soil	3 - 5	OTC535-IS-0001-062812	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/28/2012	Investigation Soil	10 - 12	OTC535-IS-0002-062812	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OT-C535-Station 2	687071.3545	1686372.7809	6/28/2012	Investigation Soil	7 - 9	OTC535-IS-0003-062812	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/28/2012	Investigation Soil	14 - 16	OTC535-IS-0004-062812	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1196 (OT-C535) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C535-Station 3	687083.6449	1686377.8964	6/28/2012	Investigation Soil	3 - 5	OTC535-IS-0005-062812	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/28/2012	Investigation Soil	10 - 12	OTC535-IS-0006-062812	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OT-C535-Station 4	687104.3989	1686299.6821	6/28/2012	Investigation Soil	3 - 5	OTC535-IS-0007-062812	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/28/2012	Investigation Soil - Field Duplicate	3 - 5	OTC535-IS-0008-062812-FD	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OT-C535-Station 4	687104.3989	1686299.6821	6/28/2012	Investigation Soil	10 - 12	OTC535-IS-0009-062812	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B

Table 3-1
Sample Summary
Building 1196 (OT-C535) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
							TPH - DRO, GRO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1196 (OT-C535) RFI Report
Holloman Air Force Base, New Mexico

[a] Coordinates are referenced to the North American Datum, 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] EPA, 2007, Test Methods for Evaluating Soil Waste Physical/Chemical Methods, EPA Publication SW-846, Final Update IV. Available online at www.epa.gov/osw/hazard/testmethods/sw846.

Percent Solids and Total Dissolved Solids from *Standard Methods for the Examination of Water and Wastewater* , 19th edition, 1995.

bgs	Below ground surface.
DRO	Diesel range organics.
EPA	Environmental Protection Agency
FD	Field Duplicate.
ft	Feet/foot.
GRO	Gasoline range organics.
IS	Investigation Soil.
MW	Monitoring Well.
ORO	Oil range organics.
PCB	Polychlorinated Biphenyl.
RCRA	Resource Conservation and Recovery Act.
RFI	RCRA Facility Investigation.
STA	Station.
SVOC	Semivolatile organic compound.
TAL	Target analyte list.
TPH	Total petroleum hydrocarbons.
VOC	Volatile organic compound.

Table 4-1
Soil Analytical Data
Building 1196 (OT-C535) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC535-IS-0001-062812		OTC535-IS-0002-062812		OTC535-IS-0003-062812		OTC535-IS-0004-062812		OTC535-IS-0005-062812		OTC535-IS-0006-062812		OTC535-IS-0007-062812		OTC535-IS-0008-062812-FD		OTC535-IS-0009-062812	
				Sample Date	6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**85.9**		**84.9**		**88**		**88.5**		**88.4**		**88.9**		**83.8**		**84.9**		**85.6**	
VOLATILES (mg/kg)																						
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0014	U	0.0012	U	0.0011	U	0.00089	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0019	U	0.0012	U	0.0012	U	0.0013	U	0.0011	U	0.0015	U	0.0013	U	0.0012	U	0.00097	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0026	U	0.0018	U	0.0017	U	0.0019	U	0.0016	U	0.0021	U	0.0019	U	0.0017	U	0.0014	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0014	U	0.0012	U	0.0011	U	0.00089	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0014	U	0.0012	U	0.0011	U	0.00089	U
1,1-DICHLOROETHENE	NE	240	449		0.0022	U	0.0014	U	0.0014	U	0.0015	U	0.0013	U	0.0017	U	0.0015	U	0.0014	U	0.0011	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0019	U	0.0012	U	0.0012	U	0.0013	U	0.0011	U	0.0015	U	0.0013	U	0.0012	U	0.00097	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0036	U	0.0024	U	0.0023	U	0.0025	U	0.0021	U	0.0028	U	0.0025	U	0.0023	U	0.0019	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.0015	U	0.001	U	0.001	U	0.0011	U	0.00092	U	0.0012	U	0.0011	U	0.00098	U	0.00081	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0014	U	0.0012	U	0.0011	U	0.00089	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.0015	U	0.001	U	0.001	U	0.0011	U	0.00092	U	0.0012	U	0.0011	U	0.00098	U	0.00081	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0019	U	0.0012	U	0.0012	U	0.0013	U	0.0011	U	0.0015	U	0.0013	U	0.0012	U	0.00097	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0019	U	0.0012	U	0.0012	U	0.0013	U	0.0011	U	0.0015	U	0.0013	U	0.0012	U	0.00097	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0014	U	0.0012	U	0.0011	U	0.00089	U
2-HEXANONE	NE	210	NE		0.0084	U	0.0056	U	0.0055	U	0.0059	U	0.005	U	0.0066	U	0.0059	U	0.0053	U	0.0044	U
ACETONE	NE	61000	66600		0.031	U	0.021	U	0.02	U	0.022	U	0.018	U	**1.81**	J	0.022	U	0.02	U	**0.0706**	
BENZENE	NE	1.1	15.4		0.0023	U	0.0016	U	0.0015	U	0.0016	U	0.0014	U	0.0018	U	0.0017	U	0.0015	U	0.0012	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0014	U	0.0012	U	0.0011	U	0.00089	U
BROMOFORM	NE	62	616		0.0023	U	0.0016	U	0.0015	U	0.0016	U	0.0014	U	0.0018	U	0.0017	U	0.0015	U	0.0012	U
BROMOMETHANE	NE	7.3	16.5		0.0031	U	0.0021	U	0.002	U	0.0022	U	0.0018	U	0.0025	U	0.0022	U	0.002	U	0.0016	U
CARBON DISULFIDE	NE	820	1530		0.0031	U	0.0021	U	0.002	U	0.0022	U	0.0018	U	0.0025	U	0.0022	U	0.002	U	0.0016	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0028	U	0.0019	U	0.0018	U	0.002	U	0.0017	U	0.0022	U	0.002	U	0.0018	U	0.0015	U
CHLOROBENZENE	NE	290	376		0.0015	U	0.001	U	0.001	U	0.0011	U	0.00092	U	0.0012	U	0.0011	U	0.00098	U	0.00081	U
CHLOROETHANE	NE	15000	29800		0.0031	U	0.0021	U	0.002	U	0.0022	U	0.0018	U	0.0025	U	0.0022	U	0.002	U	0.0016	U
CHLOROFORM	NE	0.29	5.86		0.0019	U	0.0012	U	0.0012	U	0.0013	U	0.0011	U	0.0015	U	0.0013	U	0.0012	U	0.00097	U
CHLOROMETHANE	NE	120	275		0.0031	U	0.0021	U	0.002	U	0.0022	U	0.0018	U	0.0025	U	0.0022	U	0.002	U	0.0016	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0023	U	0.0016	U	0.0015	U	0.0016	U	0.0014	U	0.0018	U	0.0017	U	0.0015	U	0.0012	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0015	U	0.001	U	0.001	U	0.0011	U	0.00092	U	0.0012	U	0.0011	U	0.00098	U	0.00081	U
CYCLOHEXANE	NE	7000	NE		0.0022	U	0.0014	U	0.0014	U	0.0015	U	0.0013	U	0.0017	U	0.0015	U	0.0014	U	0.0011	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.0015	U	0.001	U	0.001	U	0.0011	U	0.00092	U	0.0012	U	0.0011	U	0.00098	U	0.00081	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0023	U	0.0016	U	0.0015	U	0.0016	U	0.0014	U	0.0018	U	0.0017	U	0.0015	U	0.0012	U
ETHYLBENZENE	NE	5.4	68.4		0.0015	U	0.001	U	0.001	U	0.0011	U	0.00092	U	**0.022**		0.0011	U	0.00098	U	**0.0021**	J
ISOPROPYLBENZENE	NE	2100	2430		0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0014	U	0.0012	U	0.0011	U	0.00089	U
METHYL ACETATE	NE	78000	78200		0.019	U	0.013	U	0.013	U	0.014	U	0.011	U	0.015	U	0.014	U	0.012	U	0.01	U
METHYL ETHYL KETONE	NE	28000	37100		0.0094	U	0.0063	U	0.0062	U	0.0067	U	0.0056	U	**0.0119**	J	0.0067	U	0.006	U	0.0049	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0085	U	0.0057	U	0.0056	U	0.006	U	0.0051	U	0.0068	U	0.0061	U	0.0054	U	0.0045	U
METHYLCYCLOHEXANE	NE	5630	5630		0.002	U	0.0013	U	0.0013	U	0.0014	U	0.0012	U	0.0016	U	0.0014	U	0.0013	U	0.0011	U
METHYLENE CHLORIDE	NE	56	409		0.0071	U	0.0048	U	0.0047	U	0.0051	U	0.0042	U	0.0056	U	0.0051	U	0.0045	U	0.0037	U

Table 4-1
Soil Analytical Data
Building 1196 (OT-C535) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC535-IS-0001-062812		OTC535-IS-0002-062812		OTC535-IS-0003-062812		OTC535-IS-0004-062812		OTC535-IS-0005-062812		OTC535-IS-0006-062812		OTC535-IS-0007-062812		OTC535-IS-0008-062812-FD		OTC535-IS-0009-062812	
				Sample Date	6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																						
STYRENE	NE	6300	7280		0.004	U	0.0027	U	0.0026	U	0.0029	U	0.0024	U	0.0032	U	0.0029	U	0.0025	U	0.0021	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0031	U	0.0021	U	0.002	U	0.0022	U	0.0018	U	0.0025	U	0.0022	U	0.002	U	0.0016	U
TETRACHLOROETHYLENE	NE	22	7.02		0.0015	U	0.001	U	0.001	U	0.0011	U	0.00092	U	0.0012	U	0.0011	U	0.00098	U	0.00081	U
TOLUENE	NE	5000	5270		0.0019	U	0.0012	U	0.0012	U	0.0013	U	0.0011	U	**0.0067**		0.0013	U	0.0012	U	**0.0014**	J
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0023	U	0.0016	U	0.0015	U	0.0016	U	0.0014	U	0.0018	U	0.0017	U	0.0015	U	0.0012	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0014	U	0.0012	U	0.0011	U	0.00089	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0019	U	0.0012	U	0.0012	U	0.0013	U	0.0011	U	0.0015	U	0.0013	U	0.0012	U	0.00097	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0031	U	0.0021	U	0.002	U	0.0022	U	0.0018	U	0.0025	U	0.0022	U	0.002	U	0.0016	U
VINYL CHLORIDE	NE	0.06	0.728		0.0023	U	0.0016	U	0.0015	U	0.0016	U	0.0014	U	0.0018	U	0.0017	U	0.0015	U	0.0012	U
XYLENES, TOTAL	NE	630	814		0.005	U	0.0033	U	0.0032	U	0.0035	U	0.0029	U	**0.132**		0.0035	U	0.0031	U	**0.0099**	J
SEMIVOLATILES (mg/kg)																						
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
2,4-DICHLOROPHENOL	NE	180	183		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.024	U	0.024	U	0.024	U	0.024	U	0.023	U	0.023	U	0.025	U	0.024	U	0.024	U
2,4-DINITROPHENOL	NE	120	122		0.39	U	0.39	U	0.38	U	0.38	U	0.37	U	0.37	U	0.4	U	0.39	U	0.39	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
2,6-DINITROTOLUENE	NE	61	61.1		0.023	U	0.023	U	0.022	U	0.022	U	0.022	U	0.022	U	0.023	U	0.023	U	0.023	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U
2-CHLOROPHENOL	NE	390	391		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
2-METHYLNAPHTHALENE	NE	230	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
2-METHYLPHENOL	NE	3100	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
2-NITROANILINE	NE	610	NE		0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U
2-NITROPHENOL	NE	NE	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U
3-NITROANILINE	NE	NE	NE		0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.078	U	0.078	U	0.076	U	0.075	U	0.074	U	0.074	U	0.079	U	0.077	U	0.077	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
4-CHLOROANILINE	NE	2.4	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
4-NITROANILINE	NE	24	NE		0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U
4-NITROPHENOL	NE	NE	NE		0.16	U	0.16	U	0.15	U	0.15	U	0.15	U	0.15	U	0.16	U	0.15	U	0.15	U
ACENAPHTHENE	NE	3400	3440		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
ACENAPHTHYLENE	NE	NE	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
ACETOPHENONE	NE	7800	7820		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
ANTHRACENE	NE	17000	17200		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
ATRAZINE	NE	2.1	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U

Table 4-1
Soil Analytical Data
Building 1196 (OT-C535) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC535-IS-0001-062812		OTC535-IS-0002-062812		OTC535-IS-0003-062812		OTC535-IS-0004-062812		OTC535-IS-0005-062812		OTC535-IS-0006-062812		OTC535-IS-0007-062812		OTC535-IS-0008-062812-FD		OTC535-IS-0009-062812	
				Sample Date	6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																						
BENZALDEHYDE	NE	7800	NE	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.18	U	0.2	U	0.19	U	0.19	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	**0.0631**	J	0.02	U	0.019	U	0.019	U
BENZO(A)PYRENE	NE	0.015	0.148	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	**0.0493**	J	0.02	U	0.019	U	0.019	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	**0.0452**	J	0.02	U	0.019	U	0.019	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	**0.0288**	J	0.02	U	0.019	U	0.019	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	**0.0437**	J	0.02	U	0.019	U	0.019	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U
BIPHENYL	NE	51	57.1	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.078	U	0.078	U	0.076	U	0.075	U	0.074	U	0.074	U	0.079	U	0.077	U	0.077	U
CAPROLACTAM	NE	31000	NE	0.062	U	0.062	U	0.06	U	0.06	U	0.059	U	0.059	U	0.063	U	0.062	U	0.062	U
CARBAZOLE	NE	NE	NE	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
CHRYSENE	NE	15	148	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	**0.0618**	J	0.02	U	0.019	U	0.019	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
DIBENZOFURAN	NE	78	NE	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
DIETHYL PHTHALATE	NE	49000	48900	0.078	U	0.078	U	0.076	U	0.075	U	0.074	U	0.074	U	0.079	U	0.077	U	0.077	U
DIMETHYL PHTHALATE	NE	611000	611000	0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.078	U	0.078	U	0.076	U	0.075	U	0.074	U	0.074	U	0.079	U	0.077	U	0.077	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U
FLUORANTHENE	NE	2300	2290	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	**0.0758**	J	0.02	U	0.019	U	0.019	U
FLUORENE	NE	2300	2290	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.085	U	0.086	U	0.083	U	0.083	U	0.082	U	0.081	U	0.087	U	0.085	U	0.085	U
HEXACHLOROETHANE	NE	12	42.8	0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	**0.0335**	J	0.02	U	0.019	U	0.019	U
ISOPHORONE	NE	510	5120	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
M,P-CRESOL	NE	NE	NE	0.028	U	0.028	U	0.027	U	0.027	U	0.027	U	0.027	U	0.029	U	0.028	U	0.028	U
NAPHTHALENE	NE	3.6	43.0	0.031	U	0.031	U	0.03	U	0.03	U	0.03	U	0.029	U	0.032	U	0.031	U	0.031	U
NITROBENZENE	NE	4.8	53.5	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.23	U	0.23	U	0.23	U	0.23	U	0.22	U	0.22	U	0.24	U	0.23	U	0.23	U
PHENANTHRENE	NE	1830	1830	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
PHENOL	NE	18000	18300	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
PYRENE	NE	1700	1720	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	**0.0694**	J	0.02	U	0.019	U	0.019	U

Table 4-1
Soil Analytical Data
Building 1196 (OT-C535) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC535-IS-0001-062812		OTC535-IS-0002-062812		OTC535-IS-0003-062812		OTC535-IS-0004-062812		OTC535-IS-0005-062812		OTC535-IS-0006-062812		OTC535-IS-0007-062812		OTC535-IS-0008-062812-FD		OTC535-IS-0009-062812	
				Sample Date	6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																						
1,3,5-TRINITROBENZENE	NE	2200.0	NE		0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U
1,3-DINITROBENZENE	NE	6.10	NE		0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1		0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U
2,4-DINITROTOLUENE	NE	1.60	15.7		0.081	U	0.084	U	0.092	U	0.089	U	0.072	U	0.097	U	0.079	U	0.097	U	0.089	U
2,6-DINITROTOLUENE	NE	61.0	61.1		0.072	U	0.075	U	0.083	U	0.08	U	0.064	U	0.087	U	0.07	U	0.087	U	0.08	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE		0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U
2-NITROTOLUENE	NE	2.90	29.1		0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U
3-NITROTOLUENE	NE	6.10	7.82		0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE		0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U
4-NITROTOLUENE	NE	30.0	244.4		0.084	U	0.087	U	0.096	U	0.093	U	0.075	U	0.1	U	0.082	U	0.1	U	0.093	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2		0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U
NITROBENZENE	NE	4.80	53.5		0.077	U	0.08	U	0.089	U	0.085	U	0.069	U	0.093	U	0.075	U	0.093	U	0.085	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7		0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U
TETRYL	NE	240.0	244.0		0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U
METALS (mg/kg)																						
ALUMINUM	13722	77000	78000		**1770**		**7150**		**4330**		**19100**		**6110**		**3730**		**5340**		**6850**		**21700**	
ANTIMONY	1.6	31	31.3		0.98	U	1.5	U	0.95	U	0.97	U	0.98	U	1.5	U	0.99	U	1.5	U	0.92	U
ARSENIC	3.7	0.39	3.90		**1.2**	J	**1.3**	J	**2.2**	J	**10.3**		**1.5**	J	**1**	J	**1.1**	J	**1.8**	J	**3.5**	J
BARIUM	169.3	15000	15600		**36.3**	J	**57.2**	J	**52.4**	J	**117**		**54.9**	J	**39.6**	J	**43.2**	J	**57.5**	J	**178**	
BERYLLIUM	1.6	160	156		0.49	U	0.38	U	0.48	U	**1.3**	J	0.49	U	0.37	U	0.49	U	0.37	U	**1.3**	J
CADMIUM	0.3	70	70.3		0.49	U	0.76	U	0.48	U	0.48	U	0.49	U	0.75	U	0.49	U	0.74	U	0.46	U
CALCIUM	317332	NE	NE		**255000**		**229000**		**219000**		**53100**		**217000**		**285000**		**211000**		**220000**		**139000**	
CHROMIUM[d]	25	117000	117000		**1.5**	J	**7.5**	J	**4.7**	J	**20.2**		**6**		**5.4**	J	**5.7**		**7.1**	J	**24**	
COBALT	7.7	23	NE		**0.89**	J	**4.8**	J	**1.6**	J	**11.9**	J	**2.3**	J	**1.5**	J	**1.9**	J	**2.3**	J	**7.9**	J
COPPER	13	3100	3130		**2.9**	J	**4.4**	J	**3.4**	J	**12.7**		**5.4**	J	**4.2**	J	**3.1**	J	**3.8**	J	**11.8**	
IRON	23049	55000	54800		**1410**		**6950**		**4350**		**21800**		**6050**		**3530**		**4420**		**5720**		**19300**	
LEAD	10.9	400	400		**1.9**	J	**2.8**	J	**3.3**	J	**11.6**		**5.6**	J	**5.9**	J	**3.2**	J	**2.4**	J	**13**	
MAGNESIUM	16991	NE	NE		**2750**		**5230**		**3380**		**10300**		**7400**		**4570**		**4730**		**5960**		**12300**	
MANGANESE	393	1800	1860		**25.3**		**224**		**147**		**464**		**138**		**86.6**		**79.1**		**112**		**253**	
MERCURY	0.0108	10	15.6		0.0095	U	0.0095	U	0.009	U	0.0093	U	0.0091	U	0.0091	U	0.0095	U	0.0097	U	0.0093	U
NICKEL	17.4	1500	1560		**1.8**	J	**6.6**	J	**4**	J	**24**		**5.2**	J	**3.5**	J	**4.7**	J	**6.1**	J	**18.4**	
POTASSIUM	5077	NE	NE		**524**	J	**1810**	J	**1000**	J	**3690**	J	**1670**	J	**1100**	J	**1210**	J	**1580**	J	**4280**	J
SELENIUM	1.4	390	391		2	U	3	U	1.9	U	1.9	U	2	U	**3.7**	J	2	U	2.9	U	1.8	U
SILVER	1.1	390	391		0.49	U	0.38	U	0.48	U	0.48	U	0.49	U	0.37	U	0.49	U	0.37	U	0.46	U
SODIUM	5196	NE	NE		540	U	420	U	530	U	530	U	**2120**	J	**443**	J	**2120**	J	**2370**	J	**5520**	
THALLIUM	1.3	0.78	0.782		1.3	U	2	U	1.2	U	1.3	U	1.3	U	1.9	U	1.3	U	1.9	U	1.2	U
VANADIUM	42.6	390	391		**4.3**	J	**11.6**	J	**14**	J	**36.8**		**11.3**	J	**7.4**	J	**11.7**	J	**15.4**	J	**29.1**	
ZINC	54.6	23000	23500		**5**	J	**19.1**		**10.4**		**54.8**		**19.2**		**19.4**		**12.5**		**14.7**	J	**54.7**	

Table 4-1
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Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC535-IS-0001-062812		OTC535-IS-0002-062812		OTC535-IS-0003-062812		OTC535-IS-0004-062812		OTC535-IS-0005-062812		OTC535-IS-0006-062812		OTC535-IS-0007-062812		OTC535-IS-0008-062812-FD		OTC535-IS-0009-062812	
				Sample Date	6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																						
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93		0.0077	UJ	0.0078	U	0.0075	U	0.0074	U	0.0075	U	0.0073	U	0.0079	U	0.0079	U	0.0077	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49		0.0096	U	0.0098	U	0.0094	U	0.0093	U	0.0093	U	0.0091	U	0.0099	U	0.0098	U	0.0096	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49		0.0096	U	0.0098	U	0.0094	U	0.0093	U	0.0093	U	0.0091	U	0.0099	U	0.0098	U	0.0096	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22		0.0077	U	0.0078	U	0.0075	U	0.0074	U	0.0075	U	0.0073	U	0.0079	U	0.0079	U	0.0077	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22		0.0077	U	0.0078	U	0.0075	U	0.0074	U	0.0075	U	0.0073	U	0.0079	U	0.0079	U	0.0077	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12		0.0077	U	0.0078	U	0.0075	U	0.0074	U	0.0075	U	0.0073	U	0.0079	U	0.0079	U	0.0077	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22		0.0077	UJ	0.0078	U	0.0075	U	0.0074	U	0.0075	U	0.0073	U	0.0079	U	0.0079	U	0.0077	U
PETROLEUM HYDROCARBONS (mg/kg)																						
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000		4.2	U	3.5	U	4.4	U	3.6	U	3	U	3.9	U	3.3	U	3.5	U	3.3	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000		3.9	U	3.9	U	3.8	U	3.7	U	3.8	U	**6.08**	J	4	U	3.9	U	3.9	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000		3.9	U	3.9	U	3.8	U	3.7	U	3.8	U	**20.2**		4	U	3.9	U	3.9	U
CYANIDE (mg/kg)																						
CYANIDE	NE	22.0	46.9		0.068	U	0.071	U	0.066	U	0.066	U	0.065	U	0.065	U	0.07	U	0.071	U	0.07	U
TRITIUM (pCi/g)																						
TRITIUM	NE	NE	NE		5.74	U	5.72	U	5.69	U	5.59	U	5.66	U	5.73	U	5.5	U	5.42	U	5.61	U

Table 4-1
Soil Analytical Data
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Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Table 4-2
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	LDY-IDW01-090412	
		Sample Date	9/4/2012	
		Sample Type	Waste	
		40 CFR 261 Waste Characteristic Criteria	Result	Lab Qual
General Chemistry				
Corrosivity as pH	pH Units	> 2 and < 12.5	**7.7**	
Cyanide Reactivity	mg/kg	< 250	1.5	U
Ignitability (Flashpoint)	°F	> 140 °F	>200	
Solids, Percent	%	-	**84.4**	
Sulfide Reactivity	mg/kg	< 500	59	U
TCLP Volatiles				
Benzene	mg/L	0.5	0.0020	U
Chlorobenzene	mg/L	100	0.0020	U
Chloroform	mg/L	6	0.0022	U
Carbon tetrachloride	mg/L	0.5	0.0025	U
1,1-Dichloroethylene	mg/L	0.7	0.0023	U
1,2-Dichloroethane	mg/L	0.5	0.0020	U
p-Dichlorobenzene	mg/L	7.5	0.0023	U
Methyl ethyl ketone	mg/L	200	0.0020	U
Tetrachloroethylene	mg/L	0.7	0.0025	U
Trichloroethylene	mg/L	0.5	0.0026	U
Vinyl chloride	mg/L	0.2	0.0022	U
TCLP Semivolatiles				
2-Methylphenol	mg/L	200	0.0054	U
3&4-Methylphenol	mg/L	200	0.011	U
Pentachlorophenol	mg/L	100	0.054	U
2,4,5-Trichlorophenol	mg/L	400	0.0050	U
2,4,6-Trichlorophenol	mg/L	2	0.0050	U
1,4-Dichlorobenzene	mg/L	7.5	0.010	U
2,4-Dinitrotoluene	mg/L	0.13	0.0050	U
Hexachlorobenzene	mg/L	0.13	0.0056	U
Hexachlorobutadiene	mg/L	0.5	0.010	U
Hexachloroethane	mg/L	3	0.010	U
Nitrobenzene	mg/L	2	0.0059	U
Pyridine	mg/L	100	0.016	U
TCLP Metals				
Arsenic	mg/L	5	0.020	U
Barium	mg/L	100	**0.12**	J
Cadmium	mg/L	1	0.010	U
Chromium	mg/L	5	0.010	U
Lead	mg/L	5	0.010	U
Mercury	mg/L	0.2	0.00050	U
Selenium	mg/L	1	0.020	U
Silver	mg/L	5	0.010	U

Table 4-2
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

°F = degrees Fahrenheit
> = greater than
< = less than
% = percent
CFR = Code of Federal Regulations
J = estimated value
Lab Qual = laboratory qualifier
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
TCLP = Toxicity Characteristic Leaching Procedure
U = not detected at the detection limit shown

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles				
Acetone	µg/L	NE	10	U
Benzene	µg/L	5	0.21	U
Bromodichloromethane	µg/L	80	0.20	U
Bromoform	µg/L	80	0.34	U
Chlorobenzene	µg/L	100	0.20	U
Chloroethane	µg/L	NE	0.50	U
Chloroform	µg/L	80	0.26	U
Carbon disulfide	µg/L	NE	0.49	U
Carbon tetrachloride	µg/L	5	0.31	U
Cyclohexane	µg/L	NE	0.48	U
1,1-Dichloroethane	µg/L	NE	0.21	U
1,1-Dichloroethylene	µg/L	7	0.20	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.71	U
1,2-Dibromoethane	µg/L	0.05	0.30	U
1,2-Dichloroethane	µg/L	5	0.22	U
1,2-Dichloropropane	µg/L	5	0.26	U
Dibromochloromethane	µg/L	80	0.20	U
Dichlorodifluoromethane	µg/L	NE	0.50	U
cis-1,2-Dichloroethylene	µg/L	70	**0.42**	J
cis-1,3-Dichloropropene	µg/L	NE	0.22	U
m-Dichlorobenzene	µg/L	NE	0.25	U
o-Dichlorobenzene	µg/L	600	0.22	U
p-Dichlorobenzene	µg/L	75	0.20	U
trans-1,2-Dichloroethylene	µg/L	100	0.23	U
trans-1,3-Dichloropropene	µg/L	NE	0.21	U
Ethylbenzene	µg/L	700	0.29	U
Freon 113	µg/L	NE	0.33	U
2-Hexanone	µg/L	NE	2.0	U
Isopropylbenzene	µg/L	NE	0.20	U
4-Methyl-2-pentanone	µg/L	NE	2.3	U
Methyl Acetate	µg/L	NE	5.0	U
Methyl bromide	µg/L	NE	0.79	U
Methyl chloride	µg/L	NE	0.50	U
Methylcyclohexane	µg/L	NE	0.20	U
Methylene chloride	µg/L	5	2.0	U
Methyl ethyl ketone	µg/L	NE	3.1	U
Methyl Tert Butyl Ether	µg/L	NE	0.21	U
Styrene	µg/L	100	0.20	U

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles (continued)				
1,1,1-Trichloroethane	µg/L	200	0.20	U
1,1,2,2-Tetrachloroethane	µg/L	NE	0.24	U
1,1,2-Trichloroethane	µg/L	5	0.20	U
1,2,4-Trichlorobenzene	µg/L	70	0.50	U
Tetrachloroethylene	µg/L	5	0.32	U
Toluene	µg/L	1000	0.20	U
Trichloroethylene	µg/L	5	0.31	U
Trichlorofluoromethane	µg/L	NE	0.50	U
Vinyl chloride	µg/L	2	0.44	U
Xylene (total)	µg/L	10000	0.50	U
Semivolatiles				
2-Chlorophenol	µg/L	NE	0.68	U
4-Chloro-3-methyl phenol	µg/L	NE	0.78	U
2,4-Dichlorophenol	µg/L	NE	0.67	U
2,4-Dimethylphenol	µg/L	NE	0.74	U
2,4-Dinitrophenol	µg/L	NE	5.0	U
4,6-Dinitro-o-cresol	µg/L	NE	1.4	U
2-Methylphenol	µg/L	NE	0.69	U
3&4-Methylphenol	µg/L	NE	1.3	U
2-Nitrophenol	µg/L	NE	0.65	U
4-Nitrophenol	µg/L	NE	4.8	U
Pentachlorophenol	µg/L	1	4.8	U
Phenol	µg/L	NE	0.53	U
2,4,5-Trichlorophenol	µg/L	NE	0.86	U
2,4,6-Trichlorophenol	µg/L	NE	0.75	U
Acenaphthene	µg/L	NE	0.67	U
Acenaphthylene	µg/L	NE	0.67	U
Acetophenone	µg/L	NE	0.72	U
Anthracene	µg/L	NE	0.72	U
Atrazine	µg/L	3	0.83	U
Benzaldehyde	µg/L	NE	4.8	U
Benzo(a)anthracene	µg/L	NE	0.52	U
Benzo(a)pyrene	µg/L	0.2	0.55	U
Benzo(b)fluoranthene	µg/L	NE	0.73	U
Benzo(g,h,i)perylene	µg/L	NE	0.64	U
Benzo(k)fluoranthene	µg/L	NE	0.64	U
4-Bromophenyl phenyl ether	µg/L	NE	0.76	U
Butyl benzyl phthalate	µg/L	NE	0.68	U
1,1'-Biphenyl	µg/L	NE	0.92	U
2-Chloronaphthalene	µg/L	NE	0.70	U

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Semivolatiles (continued)				
4-Chloroaniline	µg/L	NE	0.66	U
Caprolactam	µg/L	NE	2.4	U
Carbazole	µg/L	NE	0.50	U
Chrysene	µg/L	NE	0.56	U
bis(2-Chloroethoxy)methane	µg/L	NE	0.67	U
bis(2-Chloroethyl)ether	µg/L	NE	0.69	U
bis(2-Chloroisopropyl)ether	µg/L	NE	0.76	U
4-Chlorophenyl phenyl ether	µg/L	NE	0.84	U
2,4-Dinitrotoluene	µg/L	NE	0.66	U
2,6-Dinitrotoluene	µg/L	NE	0.77	U
3,3'-Dichlorobenzidine	µg/L	NE	0.71	U
Dibenzo(a,h)anthracene	µg/L	NE	0.56	U
Dibenzofuran	µg/L	NE	0.72	U
Di-n-butyl phthalate	µg/L	NE	0.96	U
Di-n-octyl phthalate	µg/L	NE	0.96	U
Diethyl phthalate	µg/L	NE	0.96	U
Dimethyl phthalate	µg/L	NE	0.77	U
bis(2-Ethylhexyl)phthalate	µg/L	6	1.1	U
Fluoranthene	µg/L	NE	0.56	U
Fluorene	µg/L	NE	0.73	U
Hexachlorobenzene	µg/L	1	0.66	U
Hexachlorobutadiene	µg/L	NE	0.92	U
Hexachlorocyclopentadiene	µg/L	50	0.76	U
Hexachloroethane	µg/L	NE	0.71	U
Indeno(1,2,3-cd)pyrene	µg/L	NE	0.55	U
Isophorone	µg/L	NE	0.61	U
2-Methylnaphthalene	µg/L	NE	0.66	U
2-Nitroaniline	µg/L	NE	0.72	U
3-Nitroaniline	µg/L	NE	0.62	U
4-Nitroaniline	µg/L	NE	0.93	U
Naphthalene	µg/L	NE	0.61	U
Nitrobenzene	µg/L	NE	0.69	U
N-Nitroso-di-n-propylamine	µg/L	NE	0.82	U
N-Nitrosodiphenylamine	µg/L	NE	0.96	U
Phenanthrene	µg/L	NE	0.68	U
Pyrene	µg/L	NE	0.65	U
Petroleum Hydrocarbons				
Gasoline Range Organics (C6-C10)	mg/L	NE	0.05	U
Diesel Range Organics (C10-C28)	mg/L	NE	**0.115**	J
Oil Range Organics (C28-C40)	mg/L	NE	0.10	U

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Metals				
Aluminum	µg/L	NE	**36.2**	J
Antimony	µg/L	6	**6.7**	J
Arsenic	µg/L	10	2.5	U
Barium	µg/L	2000	**29.1**	J
Beryllium	µg/L	4	0.50	U
Cadmium	µg/L	5	1.0	U
Calcium	µg/L	NE	**654,000**	
Chromium	µg/L	100	4	U
Cobalt	µg/L	NE	**6.2**	J
Copper	µg/L	1300	**2.9**	J
Iron	µg/L	NE	**97.5**	J
Lead	µg/L	15	2.2	U
Magnesium	µg/L	NE	**310,000**	
Manganese	µg/L	NE	**179**	
Mercury	µg/L	2	0.03	U
Nickel	µg/L	NE	**3.7**	J
Potassium	µg/L	NE	**16,500**	
Selenium	µg/L	50	4.0	U
Silver	µg/L	NE	0.50	U
Sodium	µg/L	NE	**762,000**	
Thallium	µg/L	2	0.078	U
Vanadium	µg/L	NE	**4.5**	J
Zinc	µg/L	NE	**12.8**	J

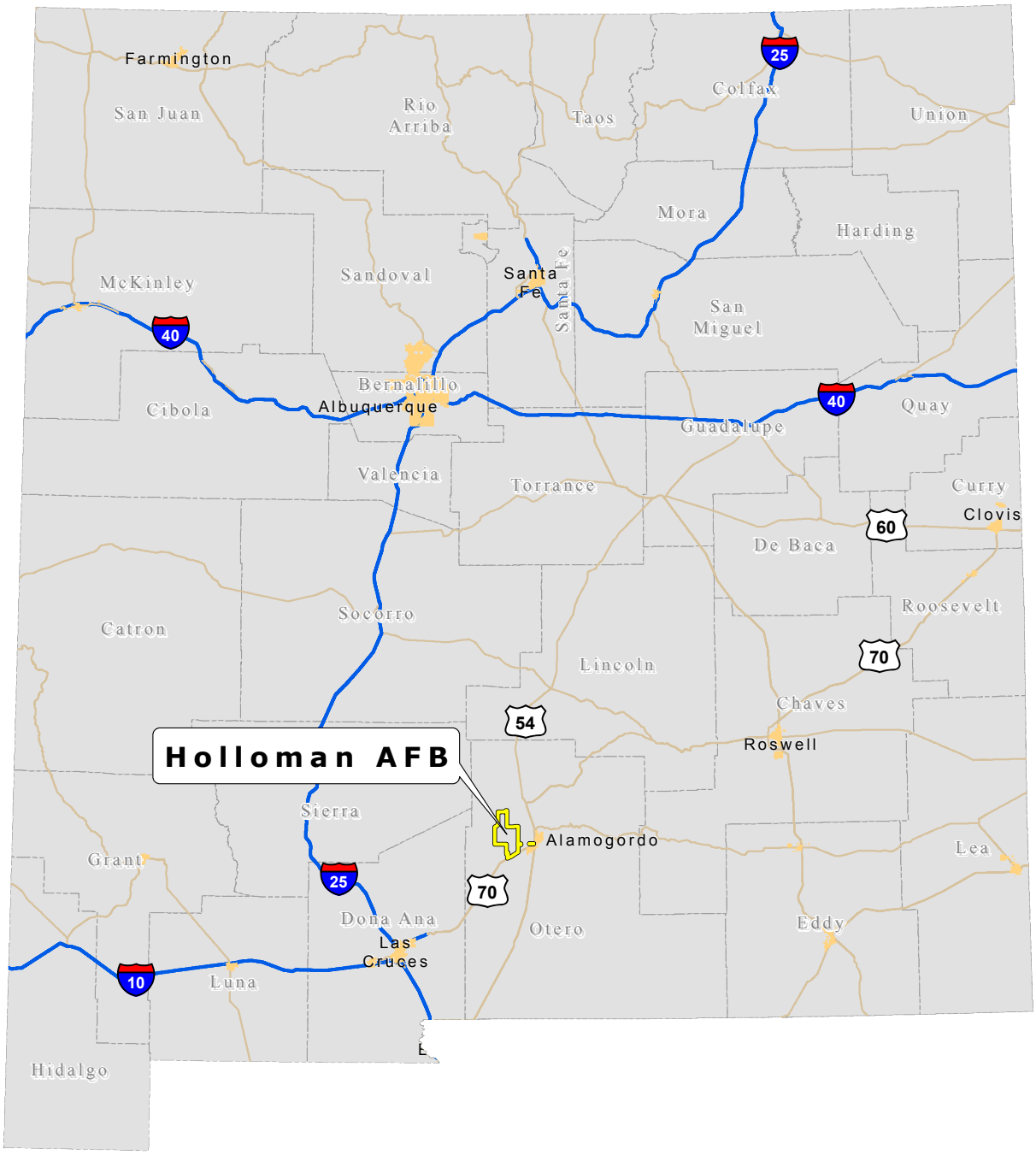
Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

[a] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

EPA = U.S. Environmental Protection Agency.
J = estimated value.
MCL = maximum contaminant level.
µg/L = micrograms per liter.
mg/L = milligrams per liter.
NE = not established
RSL = regional screening level.
U = not detected at the detection limit shown.
VQ = validation qualifier.

Figures



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Date: 8/28/2013

Approved By: BFoss

Checked By: CLong

Drawn By: BGrod

Office: Hou

Legend

Holloman AFB

N

WGS 84 UTM Zone 13N Meters

0 20 40 80
Kilometers

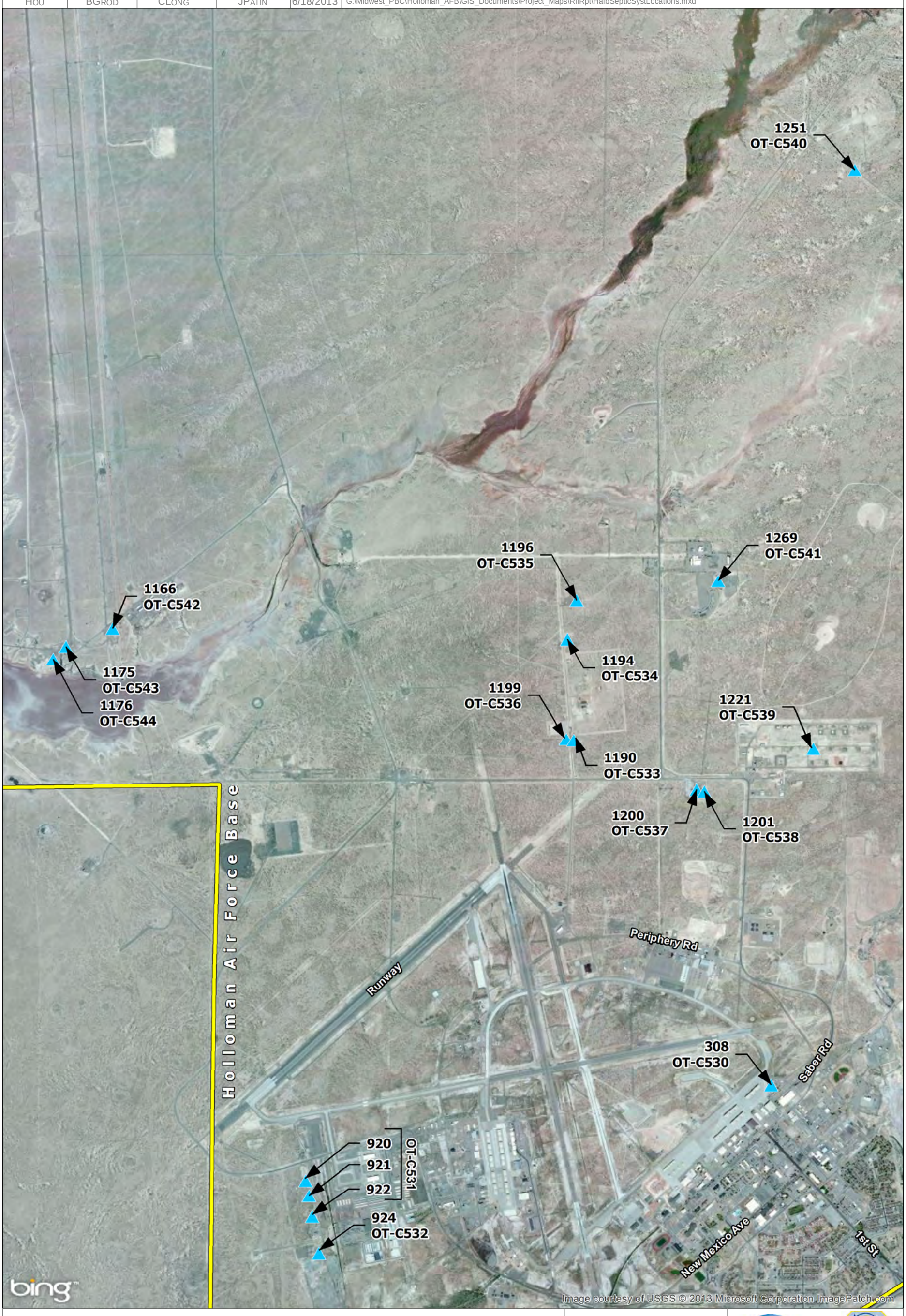
0 10 20 40
Miles

Figure 1-1

Holloman Air Force Base Location

Holloman AFB, New Mexico

Office	Drawn By	Checked By	Approved By	Date	File Path
Hou	BGrod	CLong	JPatin	6/18/2013	G:\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbSepticSystLocations.mxd



LEGEND

- Holloman AFB
- Septic Tank System

N

WGS 84 UTM Zone 13N
Meters

1 inch = 2,800 feet

0 700 1,400 2,800
Feet

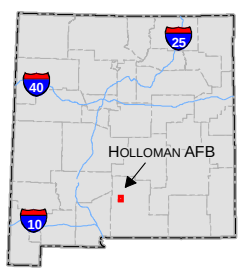
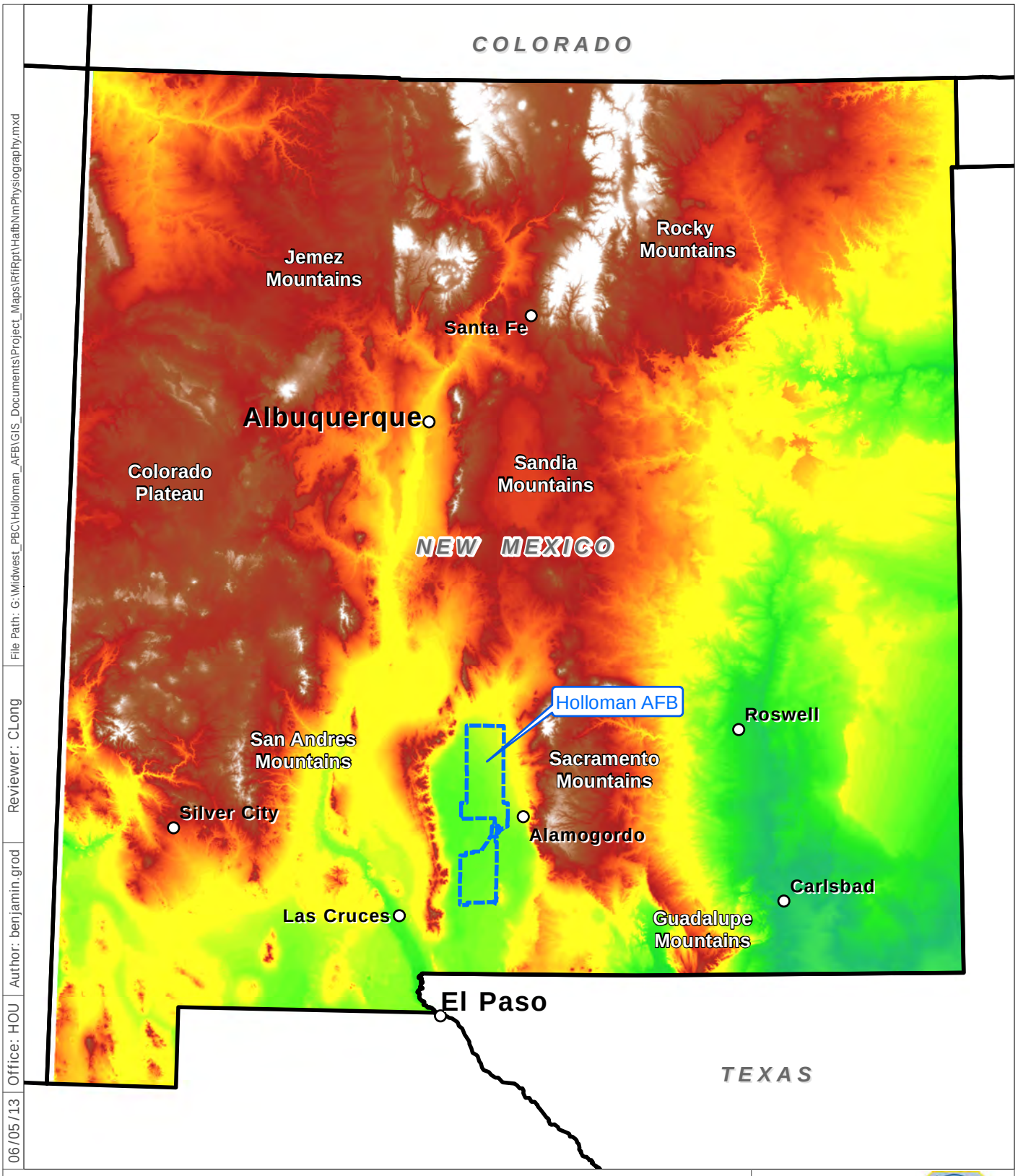


Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
Holloman AFB, NM



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Reviewer: CLong
Author: benjamin.grod
Office: HOU
06/05/13

Legend

Holloman Air Force Base (AFB) Installation Area

Elevation
- High : 3,936 meters
- Low : 0 meters

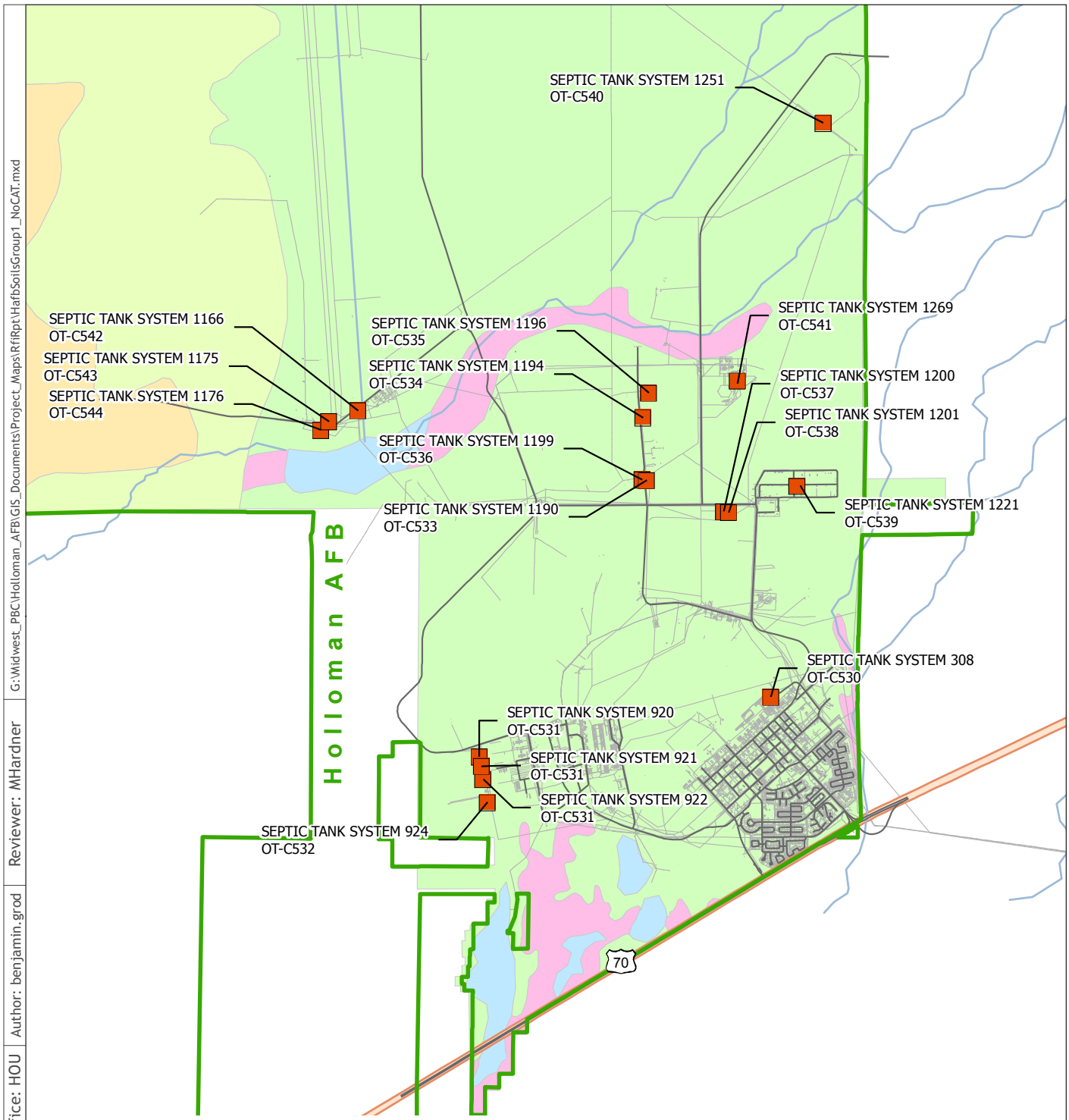
NAD 83 SPCS
New Mexico Central
Feet

0 50
Miles

Figure 2-1

Physiographic Map

Holloman AFB, New Mexico



Note:
1) Soils types at Holloman Air Force Base, New Mexico are based on United States Department of Agriculture (USDA) Soil Conservation Service Classifications. Source USDA, 1981

06/18/13 | Office: HOU | Author: benjamin.grod | Reviewer: MHardner | G:\Widwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbSoilsGroup1_NoCAT.mxd

Legend

- Installation Area
- Group 1 Septic Tank Sites
- Surface Water
- Active Dune Land Gypsum
- Duneland Yesum Association
- Holloman-Gypsum Land-Yesum complex
- Intermittent Water
- Mead Silty Clay Loam
- Rock Land Warm

NAD 83 SPCS
New Mexico Central
Feet

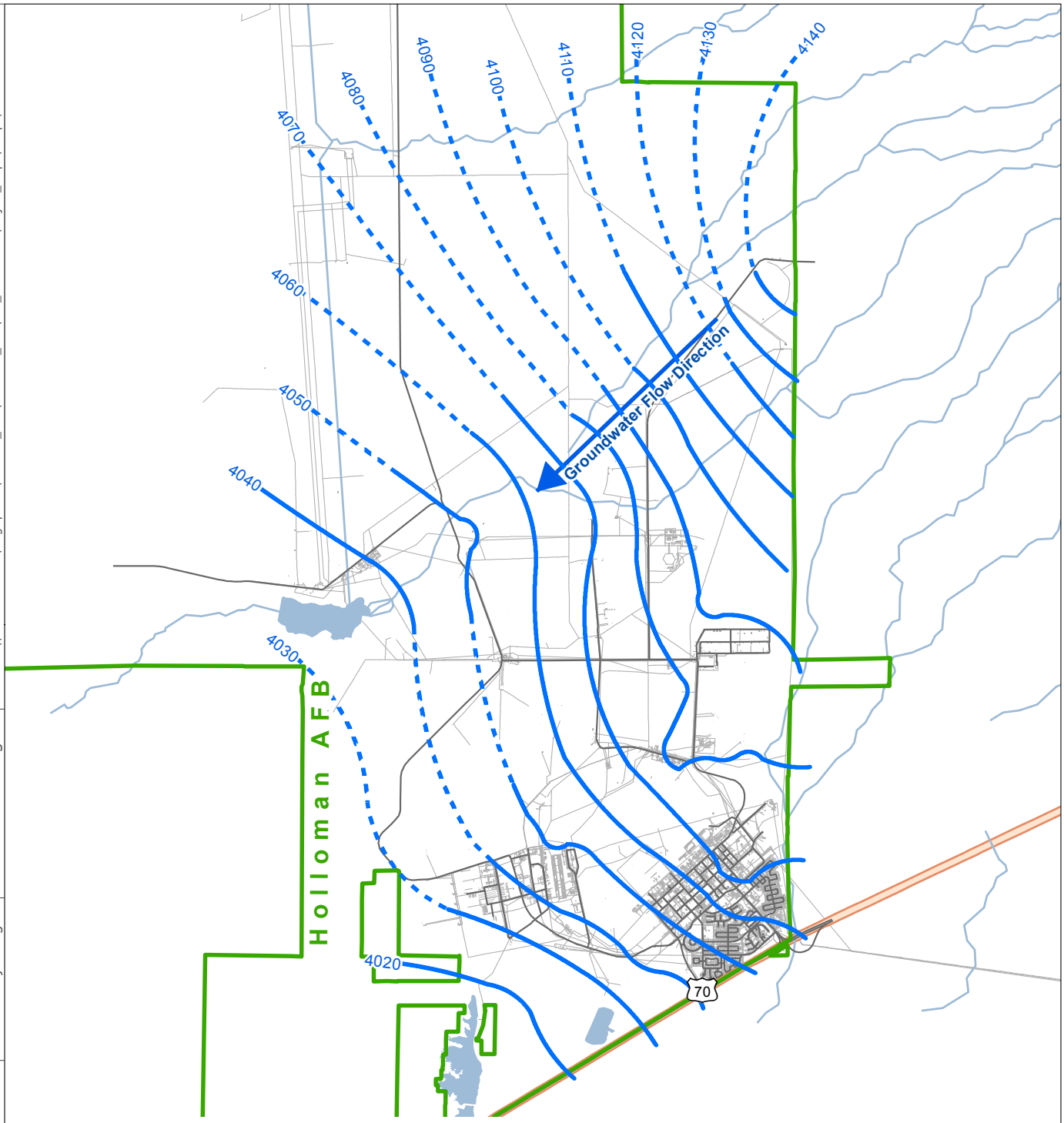
0 7,000
Feet

CBI

Figure 2-2

Septic Systems Soils Map

Holloman AFB, New Mexico



Note:
1) Groundwater contour map showing groundwater elevation contours across Holloman Air Force Base, New Mexico, are based on 2002 measurements taken from the shallow aquifer.
2) Source: Holloman AFB GIS, 2002 LTM.

08/28/13 | Office: HOU | Author: benjamin.grod | Reviewer: CLong | File Path: \\cfsfs01.cfs.com\arcgisprod2\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbGw2002.mxd

Legend

- Installation Area
- Groundwater Flow Direction
- Groundwater Elevation Contour (ft) (Dashed where inferred)
- Surface Water

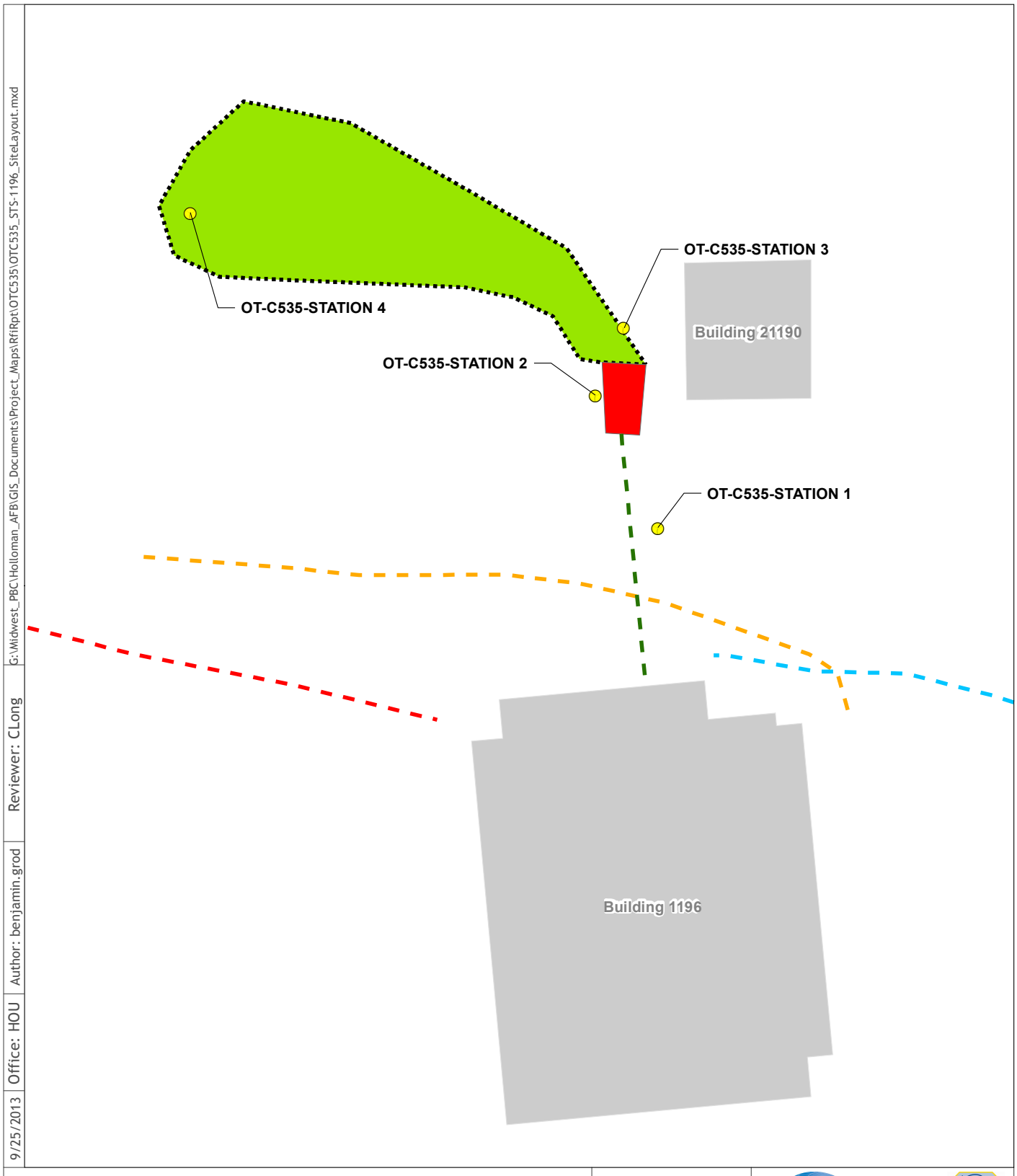
NAD 83 SPCS
New Mexico Central
Feet

0 8,000
Feet

Figure 2-3

Regional Groundwater Contour Map

Holloman AFB, New Mexico



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Reviewer: CLong

Author: benjamin.grod

Office: HOU

9/25/2013

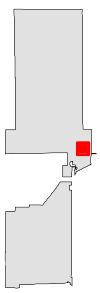
Legend

- Soil Boring Station
- Influent Line
- Electric Utility
- Water Utility
- Communication Utility
- Leach Field
- Septic Tank
- Building

N

NAD 83 SPCS
New Mexico Central
Feet

0 10 20
Feet



CBI

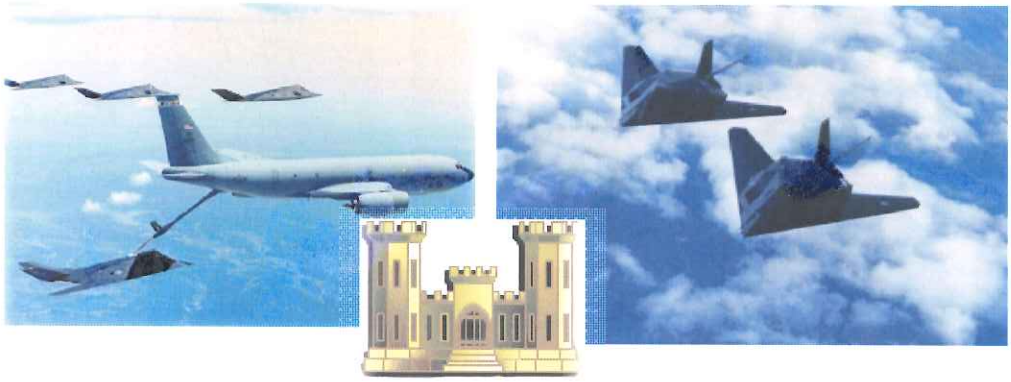
Figure 3-1

Site Layout and
Sampling Locations
Building 1196
Septic Tank System OT-C535

Holloman AFB, New Mexico

Appendix A
Historical Records

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS



Holloman Air Force Base
New Mexico

APRIL 2007

Headquarters, Air Combat Command
Langley Air Force Base, Virginia

49 CES/CEV
Holloman Air Force Base, New Mexico

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH FIGHTER WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

APR 27 2007

MEMORANDUM FOR NEW MEXICO ENVIRONMENT DEPARTMENT
Attn: Mr. James P. Bearzi
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe NM 87505-6303

FROM: 49 CES/CEV
550 Tabosa Ave.
Holloman AFB NM 88330-8458

SUBJECT: Submittal of Information Required by NMED Letter of August 30, 2006
Septic Tanks and Associated Drain Fields, Holloman AFB
EPA ID# NM6572124422

1. Pursuant to Part 4, Condition IV.B.3 of Permit No. NM6572124422, Holloman AFB is submitting the final portion of the required information.

2. This final portion of the required information covers the history of the facilities served by each septic tank and, based on the historic activities that occurred in each facility, the possible wastes that were discharged into the septic systems.

3. If you have any questions or comments, please contact Mr. Dave Griffin or Mr. George Fish at (505) 572-3931.

DEBORAH J. HARTELL
Chief, Environmental Flight

cc: w/Attachments
Mr. Cornelius Amindyas
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

Mr. David Strasser
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS
HISTORY

Holloman's records show a list of fifty seven (57) septic tank systems broken into three categories- Active Septic Systems, Inactive Septic Systems, and Removed Septic Systems. The systems are identified by the Building number they are/were attached to. There are twenty five (25) Active Septic Systems which are listed in this report. There are twenty one (21) Inactive Septic Systems that are listed and the history of activities in the building associated with the system is identified to the extent of available knowledge. There are eleven (11) Removed Septic Systems listed with histories based on available record knowledge.

The Active systems are identified, but no histories of the buildings are provided as this will likely change over time particularly with change in mission (aircraft on base) or tie-in to the base waste water treatment system. A history will be added to this list if and when the septic system is no longer needed and moved to the Inactive or Removed list.

The Inactive systems are scheduled for proper closure per guidance given in the NMED Liquid Waste Regulation 20.7.3.307 NMAC. This regulation calls for capping of the line(s) from the building to the septic tank, pumping out the tanks contents, penetration of the bottom of the tank, along with collapse of the tank roof and filling of the tank with sand or soil.

The septic systems on the Removed list have had the actual septic tank excavated and removed.

A search of Real Property records and the Historic Properties Inventory yielded the information available on the buildings. There was not information available on every building, but if new information becomes available, it will be added to the list.

Attachment 54a-e shows the current plan of where the sewer system lies to show what buildings are currently connected to Holloman's Sewer System. Any building that does not have an active septic tank is either abandoned or connect to Holloman's Sewer System.

ACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	149	1998		1000
2	312	1994		1000
3	375	1968		500
4	882			
5	864 (863)	1994	5'x8'x6'4"	750
6	885	1970	7'10"x4'8"x6'10"	1000
7	886			
8	887	1991		1000
9	923	1959	4'2"x7"x7'9.5"	1600
10	1022	1992		1200
11	1066	1994		1000
12	1160	1957	5'x12'4"x7'6"	1500
13	1161	1957		750
14	1162	1957		350
15	1163	1957		350
16	1169	1962		1680
17	1195	1962		1260
18	1256	1970	12'8"x4'8"x5'	
19	1270			
20	1271			
21	1278	2004		1250
22	1284			
23	1625			
24	75600	1989		1200
25	La Luz Gate (1290)(**1292**)	2004		1250

INACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	308	1965		
2	920	1959	4'2"x7"x7'9.5"	1600
3	921	1959	4'2"x7"x7'9.5"	1600
4	922	1959	4'2"x7"x7'9.5"	1600
5	924	1959	4'2"x7"x7'9.5"	1600
6	1091	1969	6'8"x3'x8'5"	
7	1097	1987	5'10"x5'x7'8"	1672
8	1190	1952	9'x4'x8'10"	3000
9	1194	1987	4'x4'x8'10"	1350
10	1196	1993	4'6"x11'x6'	1300
11	1199	1957		500
12	1200	1954	4'x8'x4'	1000
13	1201	1951	2'6"x6'6"x5'5"	650
14	1219	1985	5'4"x10'6"x8'4"	
15	1221	1983	4'8"x9'4"x6'2"	1100
16	1226	1985	5'6'2"x6'	
17	1235	1986		1189
18	1239	1977	4'6"x8'6"x6'	750
19	1250	1957		350
20	1251			
21	1269	1966	4'6"x9'	500

INACTIVE SEPTIC SYSTEMS

BUILDING 308

This is a 3200 SF building originally constructed in 1965. The original operation in the building was calibration of guided weapons for aircraft. In the 1970s and early 1980s the building was used as a nosedock for F-4 - Test Aircraft Radar electronic work area. It has never had a floor drain.
This facility is currently being used to store air craft support equipment for Building 309. The shop has been used in the past for servicing, inspecting, and repairing AGE equipment, but due to the reduction in personnel, this work is currently only performed in Building 309. The need to expand the work area for AGE equipment maintenance into Building 308 in the near future is not anticipated. A current view of the building is shown below in Figure 1.

Figure 1: Picture of Bldg. 308

Facilities associated with the septic system consist of:

- Toilet
- Lavatory
- Janitorial Sink

The building is located at 340 Delaware Ave. The point of contact for this building is Ms. Vicky Cruz and Mr. Adam Ferrara, they can be reached at 575-~~475~~-5272. The hours

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of operation for this building when it is in use is one 8.5 hr shift (0630-1500) and one 9 hr shift (1500-2400), five days per week.

Industrial Wastewater Drainage: There are no floor or trench drains in this facility. A janitor's sink is located in the restroom. The sanitary sewer pipe from the restroom connects with the pipe from the restrooms in Building in 309. The effluent pipe then proceeds south to Manhole 334E the layout of this facility can be seen below in **Figure 2**. At the time of the inspection surveyors were unable to open Manhole 334E. No cross-connections to the storm sewer were identified.

Industrial Wastewater Sources/Existing Pretreatment/ Existing Management Practices: There is only once source of industrial wastewater from this facility: floor washing

Floor Washing: The floor in this facility is washed every three months using a Tennant floor scrubber, 10 gallons of water and Simple Green. Average and maximum daily wastewater flows from this activity are estimated to be less than one gallon and ten gallons, respectively. The wastewater from this activity is discharged into the French drain at Building 309; therefore, the quantity of wastewater generated by this activity is included in the flow summary for Building 309.

Existing management practices consist of sweeping the floor prior to washing it.

Site Description: Aircraft Corrosion Control
Site Specific Contingency Action Plan: See Attachment 1
Secondary Containment Routes: None
Probable Spill Route: Leaks dissipate in local area on ground
Material Compatibility: No material incompatibilities

Connected to Sewer?

Stored Substances:

Chemical	Container Type
MEK	1 gallon can
Polyurethane Paint	1 gallon can
Naptha	1 gallon can
Toluene	1 gallon can
Epoxy Primer	1 gallon can
PD-680 Type II	55 gallon drum
Waste Paint/Thinners	55 gallon drum

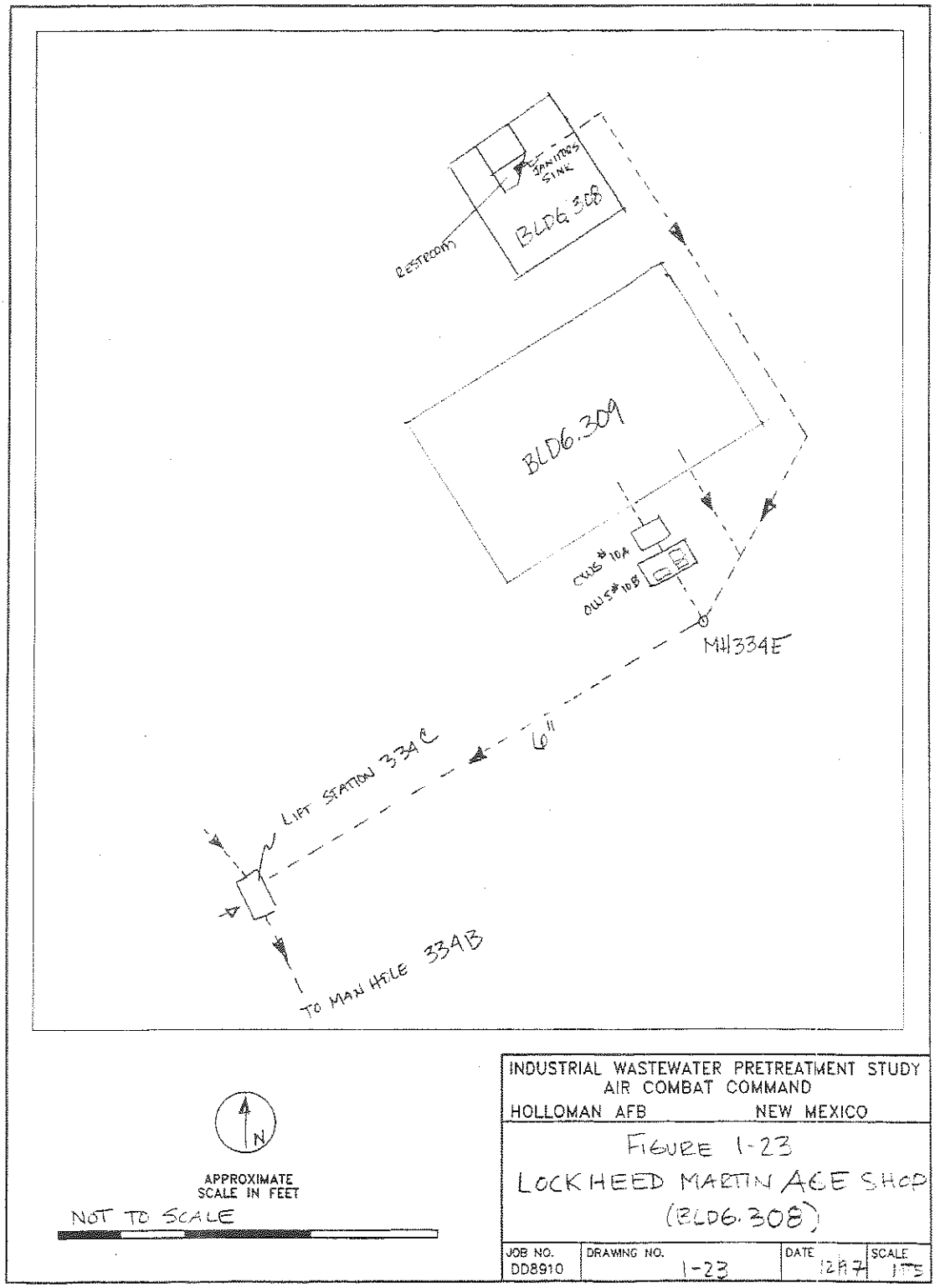

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Figure 2: Layout of Bldg. 308 and 309

INACTIVE SEPTIC SYSTEMS

BUILDINGS 920, 921, 922

These are three identical buildings constructed in 1959. Each building has 1900 SF. They were originally built for ammunition assembly which primarily consisted of bolting rocket components together prior to use. All three buildings are presently vacant and empty.
Each of the three buildings has a simple bathroom consisting of a:

- Toilet
- Lavatory

Multiple inspections were set up for this site, but no one showed up. Therefore, no follow-up information was found. Pictures of the current buildings are shown below in Figures 3-5.

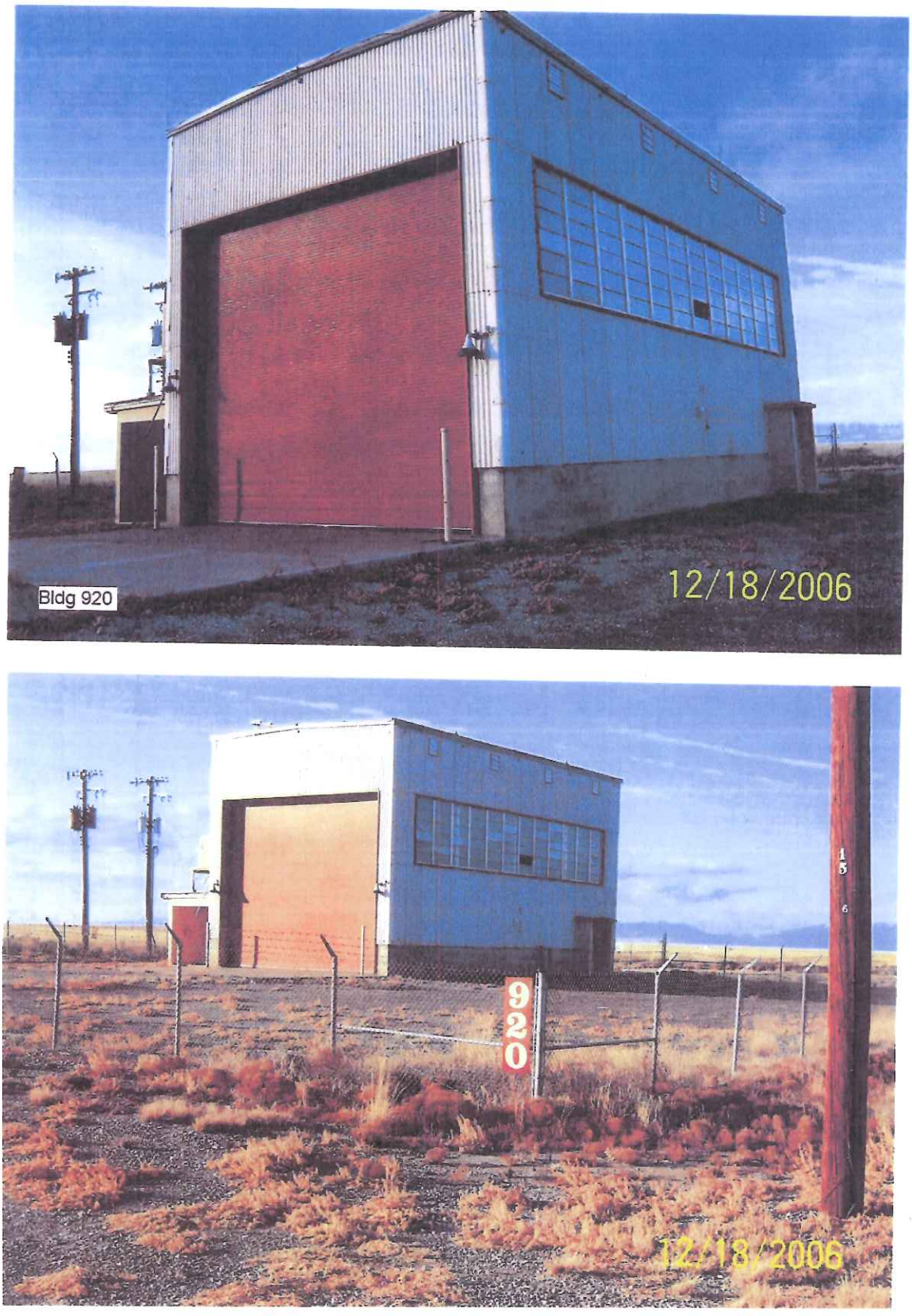


Figure 3: Pictures of Bldg. 920

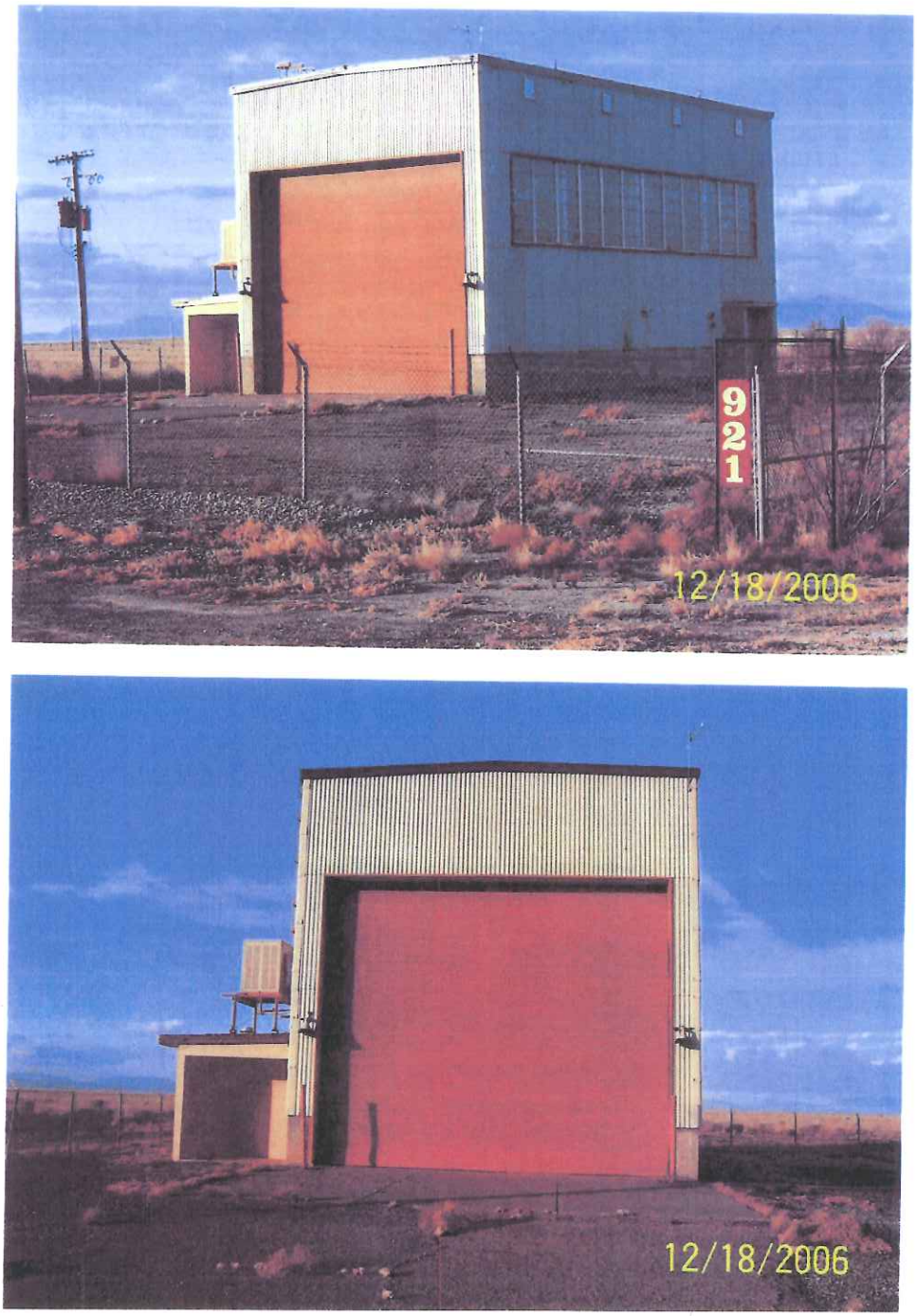


Figure 4: Pictures of Bldg. 921

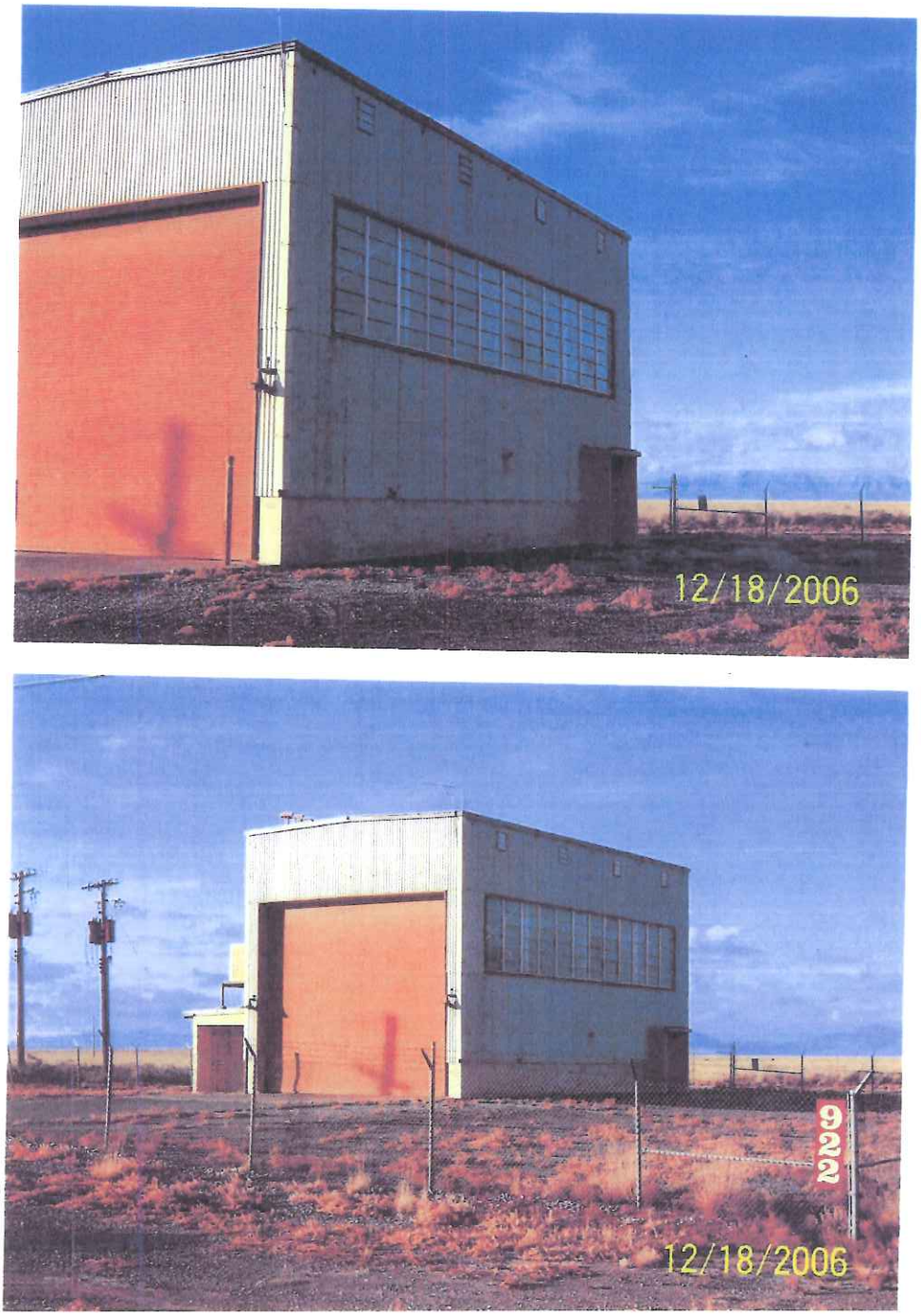


Figure 5: Pictures of Bldg. 922

INACTIVE SEPTIC SYSTEMS

BUILDING 924

This building was constructed in 1959 and has 4800 SF.
The building's original service was ammunition assembly similar to buildings 920-922.
It was later used for maintenance of radar tracking equipment.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

An on site inspection was done for this building on 20 Dec 2007 with the current facility manager, Mr. Michael Tackett. He did not have any information about the history of the septic tank system. Currently the building is being used for munitions storage. For the past two year it has stored rocket motors for the test track. From the on site inspection and drawings (Attachment 4-6) it can be seen that the bathroom drain is separate and there are no floor drains.

There are no pictures on file of this building.

INACTIVE SEPTIC SYSTEMS

BUILDING 1091

Site Description: There are no current files on this building because the building has been demolished. The building served as the Airfield Control Tower until replaced by the present Control Tower
On Attachment 55b a drawing of where the leach field was located in 1984 can be seen.
Grid Coordinates: J.9, 10.2
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: No secondary containment associated with underground storage tank
Probable Spill Route: Leakage from underground tank will contaminate water table in local vicinity

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 / UST

There were also three drawings that were discovered during the research stage of the project. The drawing (Attachment 7) shows the Septic Tank Details, Septic Tank Drain Field and the Drain Field Details.

INACTIVE SEPTIC SYSTEMS

BUILDING 1097

Specifications and history of this building are given in the following "Cold War Survey: Holloman Air Force Base". Along with this survey an on site inspection was done on 28 November 2007 with the current facility managers, A1C Clinton Bennett and TSgt Robert Edyburn. During the on site inspection it was discovered that the bathroom is separated from work area drains. In the past the building was used as a communications work center (office space) until 2005. There are no floor drains in the work area. It is currently being used as a houses base for a radio system network. There were also three drawings (Attachment 8-10) that were discovered in the investigation phase of the project. The drawings show the Materials Septic System, the Septic Tank Placement and Piping, the Latrine Plan, and the Mechanical Plumbing Plan.

Facilities in this building consist of:

- Toilet
- Urinal
- Lavatory

Description: Communications facility
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: None
Probable Spill Route: Leaks dissipate in local area on ground

Tank Location: South of facility
Fuel Flow – South/West

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 /AST
	500 gal each/ 1 /UST (Abandoned)

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Communications, Receiver.
Historic: Transmitter/Receiver.
Street Address: 1432 Sabre Road, HAFB, 88330-7842.

Building Number: 1097

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [ ] Minor [ ] Moderate [x] Major

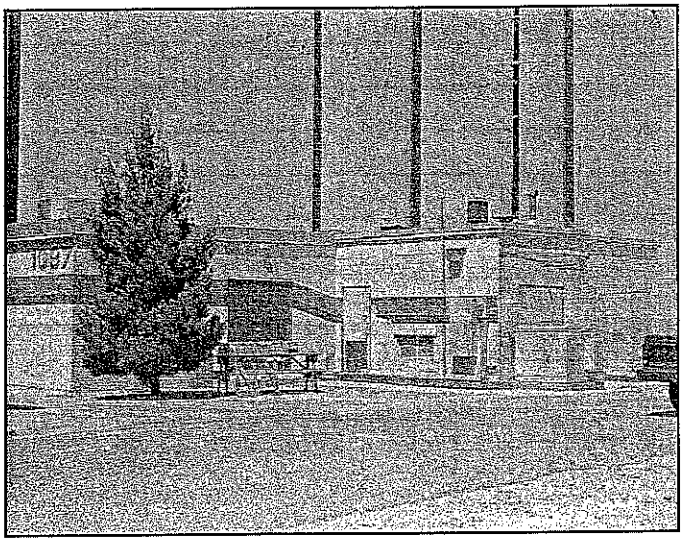
Comments:

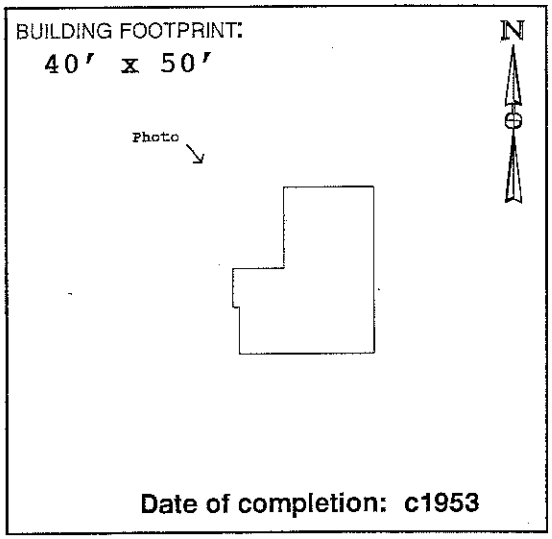
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1097 has not retained historic integrity.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1953

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1097 is a small transmitter building designed with few embellishments for utilitarian use only. Building 1097 originally had a rectangular footprint identical to Building 1098 and Building 1095. The original floor plan was sectioned into 4 rooms. An addition was constructed at the west elevation in 1986 using compatible structural and architectural components (CE File #1097-1). Both the builder and the architect are unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1097.

Current Function: Receiver/Air Traffic Control/Radio Control.

Original Function: Transmitter/Receiving/Communications.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1098-1 (c1952).

Foundation: Concrete wall footing. Concrete slab on granular fill.

Exterior walls: Painted concrete masonary units (CMU).

Roof: BUR on 2" rigid insul.; 2" poured gypsum on gyp board sup. by steel joists.

Notable interior features, including machinery:
Construction drawings document *"UHF Radio Air/Ground Facilities AN/GRC-27"*.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:
Continues to function as a communications facility/receiver site.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1097 has served as a Base communications facility since its completion c1953. Several renovations have resulted in a loss of historic integrity for this building. Building 1097 is no longer eligible for the National Register of Historic Places.

VII. ASSOCIATED BUILDINGS:

Location plan CE File #1098-2 identifies at least three north area transmitter sites. Building 1097 was associated with transmitter Building 1098. This facility is also associated with the flightline, and with communications Building 221.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building #1097 retains its original function as a radio receiver facility, however it has been modified to accommodate electrical, mechanical, and equipment additions and change-outs. Original equipment has been replaced.

Office space was added to the south elevation (1986: CE File #1097-1). All six windows at the north, east and west elevations have been blocked in. Original doors have been replaced. Vinyl floor tile covers original tile throughout. Dropped ceilings have been added.

This building, although retaining historic significance as a receiving site, has lost integrity of design, materials, workmanship, and association with its period of significance. Note: A Sgt. Boots (extension 3132) was identified by Building 1097 personnel as being a possible source for oral history research concerning specific activities associated with this facility.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Office space added to the west elevation (c1986: CE File #1097-1).

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Construction of adjacent buildings has altered viewshed.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Windows have been blocked in.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: An addition obscures the original west elevation. The original window treatments removed. Dropped ceilings added. Original asphalt floor tile covered.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: The presence of interior communications equipment and exterior poles contribute to the integrity of feeling as a radio site.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

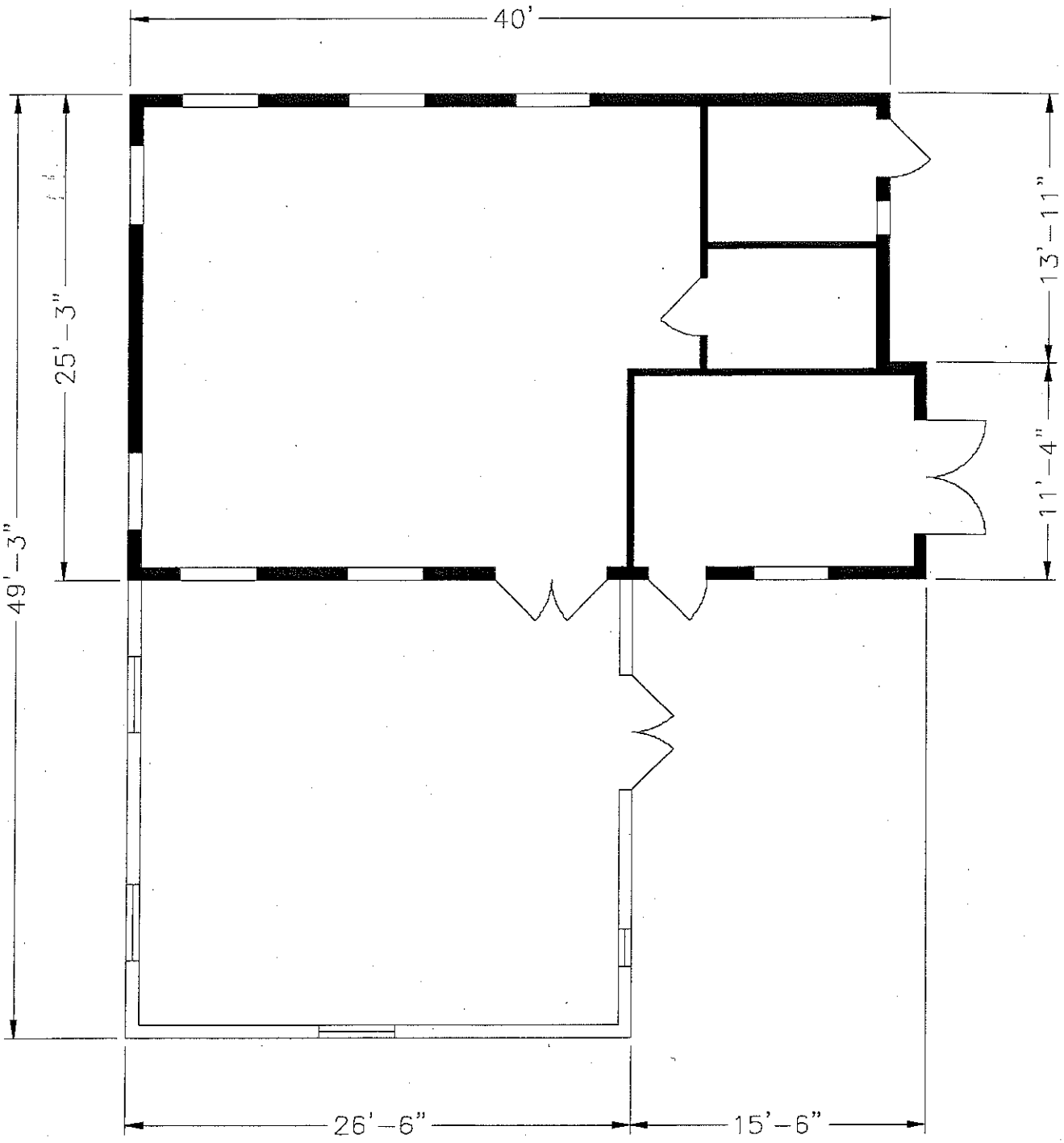
Comments: Original equipment has all been replaced.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #81**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



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Source: CE File #1098-2 (c1971)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1097** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1190

This building was constructed in 1952 and demolished in 2002. Specifications and history are provided in the "Cold War Survey".

The only drawing discovered was the plumbing floor plan and it can be seen in Attachment 11. Attachment 55d shows the current location of the leach field in 1984.

2002 Demolished Due To Unrelated Condition

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Security Police Building.
Historic: Change House/Unconventional Fuel Storage.
Street Address: 1514 Lethal Road, HAFB, 88330-7840.

Building Number: 1190

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1190 is in need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

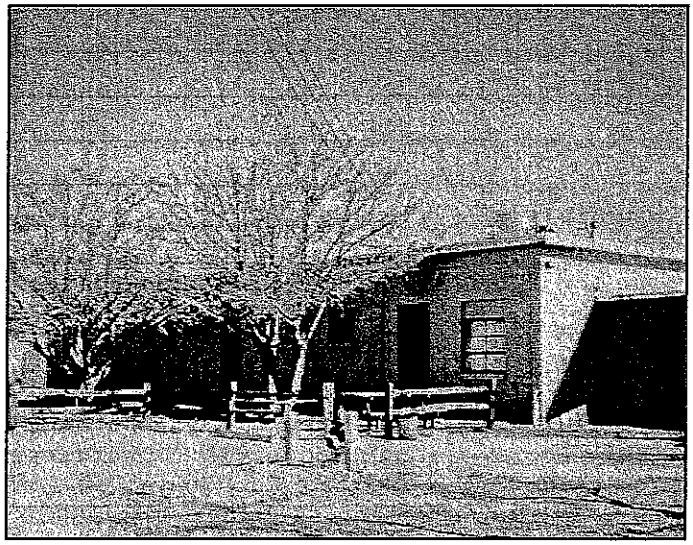
Comments: Interior partitions have been removed (date unknown).

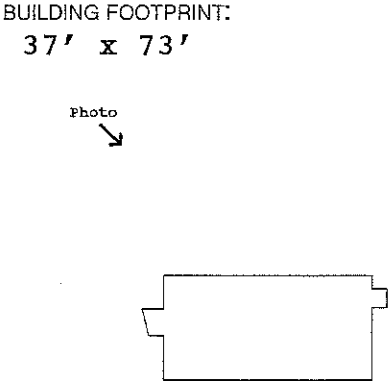
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1190 is a single-story, flat-roofed, concrete masonry unit (CMU) building exhibiting large roll-up equipment doors, numerous personnel access doors, and asymmetrical window fenestration. Construction drawings prepared in 1951 were stamped "As-built" but were not stamped in the revision block. Real Property Accountable Record/1190 indicates that Building 1190 was completed c1952 as a Change House for unconventional fuels personnel. W. C. Kruger Company (Santa Fe, NM) provided the construction drawings stored in CE File #1190. The builder is not known. A comparison of the current building and original blueprints reveals that no structural modifications to the building have occurred.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1190; CE File 1195-1 (c1951).

Current Function: Security Police operations.

Original Function: Change House, Unconventional Fuels.

Interim Functions: "RC Con House" (n.d.); "Prpln R-L Fuel/Lub" (n.d.); Prop Res Lab Rocket" (n.d.); "Prpln R-L Rkt" (n.d.); Sp Operations (n.d.).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1190-1 (c1951).

Foundation: Poured concrete footings and grade beams; concrete slab.

Exterior walls: Concrete masonry units (CMU).

Roof: (Built-up) gravel on rigid insul.; 2" slab sup. by metal lath and steel joists.

Notable interior features, including machinery: Shower stalls, locker room, dressing room, and laboratories.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

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VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Recommend reassessment of Building 1190 once the fifty-year construction date is met in the year 2002. This building retains historic integrity.

VII. ASSOCIATED BUILDINGS:

According to CE File #1190-1 *Title Sheet*, Unconventional Fuels Storage Building 1190 was associated with Building 1194 (Booster Inspection), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

This building retains all aspects of historic integrity. Although not meeting the "exceptional importance" standard imposed on buildings constructed within the last fifty years, Building 1190 remains potentially eligible as an individual property once the fifty-year date of construction is met in the year 2002. Recommend inclusion in a Multiple Property nomination along with the other unconventional fuels storage buildings. Building 1190 is currently being used as a storage and administrative facility by the 49th Squadron Security Police personnel. The original shower stalls, dressing room, locker room, shop, tools and supply rooms are all used for storage. Free-standing shelves have been installed to accommodate storage. As a result, some original doors and windows are blocked from view. Minor alterations have occurred at the interior. Two partitions have been removed. Glazed tile walls appear to have been added to at least one office. Vinyl tile has been installed over one section of the concrete slab in what once served as a machine shop. Some of the window panes have been painted. Because this facility remains potentially eligible, recommend that the original design features be considered in future modifications, and that photographs document any changes to the essential features. Suggested routine maintenance: Prune trees away from principal facade. Noticeable water damage warrants inspection of the roof. Replace broken window panes. Repair hole at exterior south elevation wall.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: Interior room layout as a Change House remains a key design element. This layout includes large open interior spaces, smaller labs/offices, and showers, dressing, and locker rooms used by unconventional fuels personnel.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Although no longer used as such, Building 1190 continues to be situated in the vicinity of other buildings historically associated with unconventional fuels testing and storage. This building appears to been recently landscaped.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two interior partitions removed. Glazed tile walls in office rather than CMU shown on original drawings.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Nearly all original workmanship remains visible, particularly at exterior.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Aside from the change in operations occurring here, Building 1190 remains essentially as it was originally constructed.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

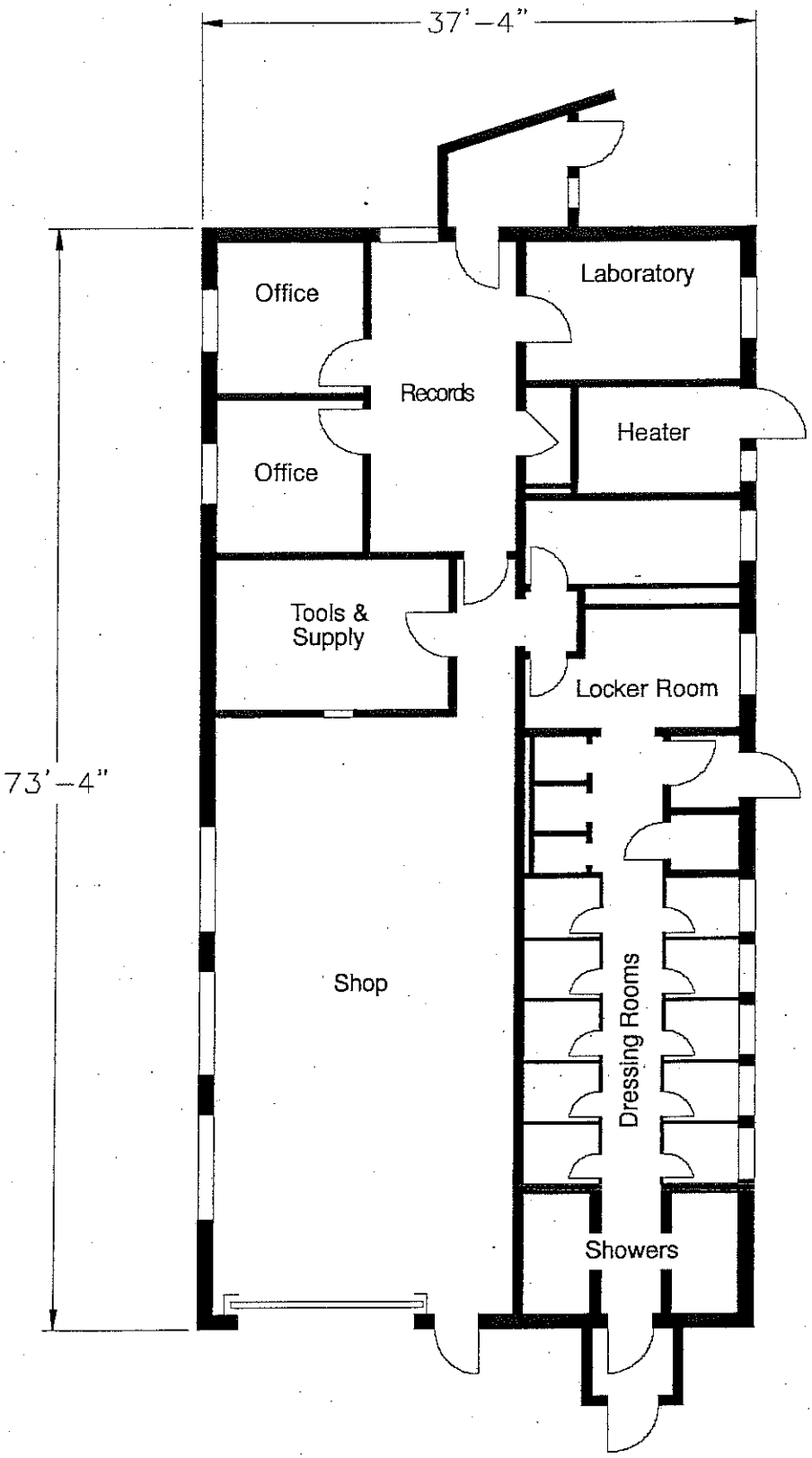
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #-Photo #**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1190-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1190** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Mike Gardner* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1194

Specifications and history are given in the "Cold War Survey".
Facilities in this building consist of:

- Toilet
- Lavatory

An on site inspection was done on 7 Jan 08 with the current facility manager, SSgt Joshua Roberts. In the inspection it was noted that the bathroom is separated from the work area drain. There was no history known. The building is currently being used for storage and it has been used for storage and has been used for storage for the past ten years.
Attachment 55d shows where the leach field for Bldg.1194 was located in 1984.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME: **Building Number:**

Current: Research Equipment Storage.

Historic: Booster Inspection/Unconventional Fuel.

Street Address: 1584 Lethal Rd., HAFB, 88330-7840. **1194**

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1194 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

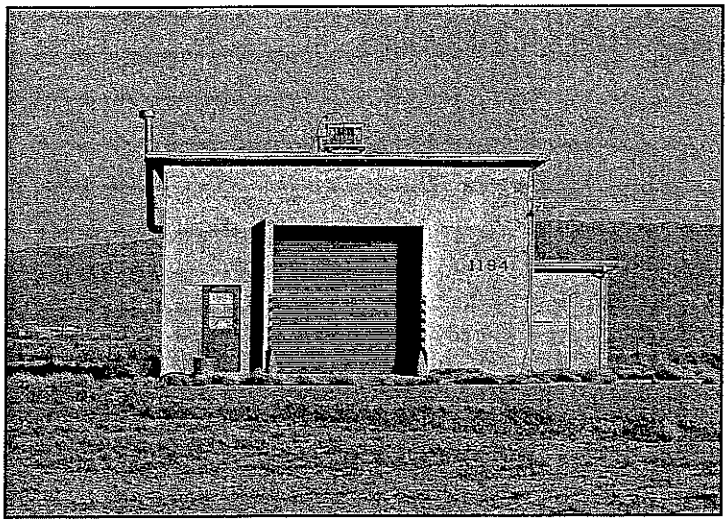
Comments: Interior partitioning is reversible.

Preliminary Determination of National or State Register Eligibility:

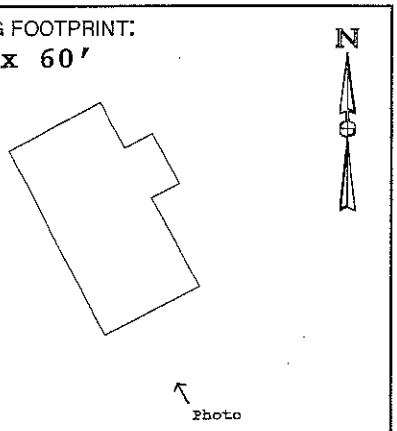
[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.



BUILDING FOOTPRINT:
30' x 60'



Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1194 is a rectangular, single-story, high bay structure made of concrete masonry units (CMU) and exhibiting a flat roof. The principal elevation faces west, showing one large roll-up door, and one personnel door. One row of windows is located below the eave line at the north and south elevations. The ceiling at the interior is exposed. "As-built" construction drawings show that Building 1194 was completed in 1952. W. C. Kruger Co. (Santa Fe, NM) provided the architectural work (1952: CE File 1194). The builder is unknown. No structural modifications to the original structure were noted.

III. HISTORIC AND CURRENT USE:

Current Function: Research equipment storage.

Original Function: Missile Assembly Test Building/Booster Inspection.

Interim Functions: "Mls/Space Rsch Tst" (n.d.); "M/Assembly Test Bldg" (n.d.); "Shp Wpn and Rlse Sys" (c1976); "BE Stor Cv Fclty" (n.d.); "Rsch Equip Stor" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1195-1 (c1952).

Foundation: Poured concrete footings and stem wall. Slab on compacted fill.

Exterior walls: CMU between concrete columns and bond beams.

Roof: BUR gravel. Rigid insulation. 2" concrete deck supported by steel joists.

Notable interior features, including machinery:

4-ton Wright Company chain-operated crane and hoist system, hoist no. 5197, serial no. 4925. The hoist is attached to a runway "I"-beam (crane) supported by steel support beams. Large metal roll-up doors at east and west elevations.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

210

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1194, although not meeting the "exceptional importance" standard, may be eligible for the National Register for its role in early Cold War materiel development once the fifty-year construction date is met in 2002.

VII. ASSOCIATED BUILDINGS:

According to CE File #1195-1 (c1951) *Title Sheet*, Building 1194 was associated with Building 1190 (Change House), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1194 remains essentially as it was constructed c1952. The original floor plan layout included one main room and an equipment room. A small area in the northwest corner of the main room has been partitioned. No documentation was found pertaining to this modification. This minor partitioning of the main room is reversible. This building is no longer associated with either missile assembly and test activities or unconventional fuels storage, and currently serves as an equipment storage room for the 6585th Test Group. Construction drawings (1956: CE File # 1194-1) show that an addition to this building was planned. There is no indication that this addition was ever built. Because this building retains historic integrity, and may be eligible for the National Register under Criteria A and/or C once the 50-year construction date is reached in the year 2002, recommend that future modifications take essential design features into account. Note: One isolated occurrence of prehistoric artifacts was noted on the grounds north of the building, including one white chert core, and one secondary chert flake.

Suggested routine maintenance: Scrape, prime, and paint the exterior. Replace downspouts. Prune landscape plantings away from foundation.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Construction drawings show plans for an addition to the north elevation (1956: CE File #1194-1). There is no evidence that this addition was ever built.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The high open-bay floor plan allowing the crane and hoist system, and the large metal equipment roll-up doors remain as key design elements.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Buildings 1193 and 1194 remain in an unmodified and isolated setting.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Nearly all of the historic materials used to construct this building remain visible.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two doors have been replaced. All windows appear to be original. Interior partitions at the northwest corner divide the original floor plan.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Although retaining its original open floor plan, this building is currently used for storage of modern equipment.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

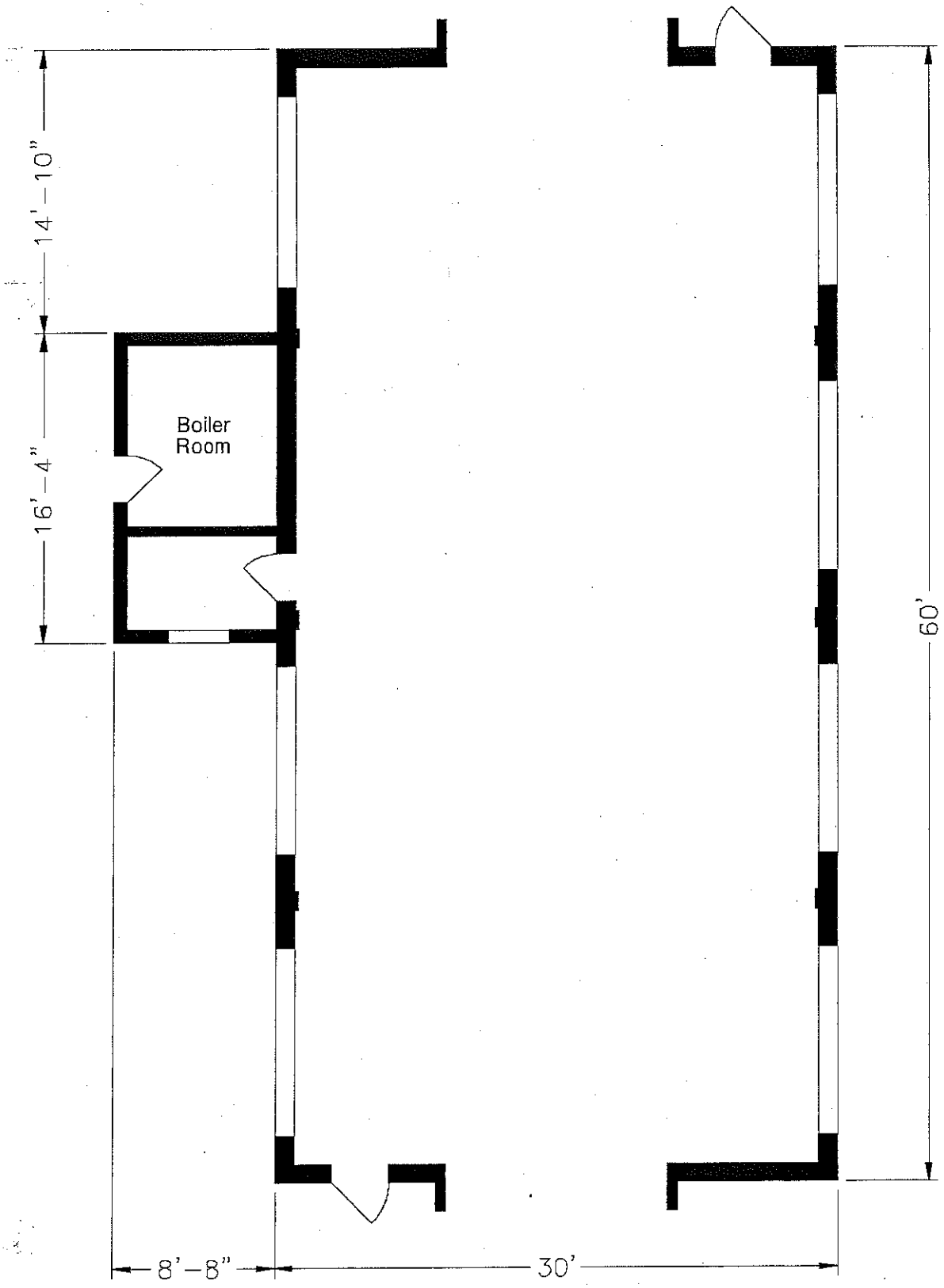
Comments: The open floor plan, isolated setting, hoist system, and nearby continuity check stand (Building 1193) contribute to this building's integrity of association.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #3-Photo #31**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1195-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1194** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1196

This building was constructed in 1956. It originally built for missile assembly, but is now in communications equipment storage.
The original facilities consisted of:

- Toilet
- Lavatory

These facilities were replaced in 1975 with:

- Toilet
- Urinal
- Lavatory

An on site inspection for this building was done on 4 Dec 07 with the current facility manager Sgt Lander. The information gathered from this inspection was that there were not any floor drains located within the building. In the past it was used for TAC can and for the past ten years it has been used for storage.
Attachment 55d shows where the leach field for Bldg. 1196 was located in 1984.

Figure 6: Picture of Bldg. 1196

INACTIVE SEPTIC SYSTEMS

BUILDING 1199

This building was constructed in 1957. It was originally built as a rocket fuel laboratory. In 1987 it was converted to the Security Forces Kennel.
As the fuels laboratory, it contained:

- Toilet
- Urinal
- Lavatory
- Shower

After conversion to the kennel, the facilities were changed to:

- Toilet
- Urinal
- Stainless Steel Sink

During the investigation stage of the project there were drawings found for building 1199. Attachment 12 and 13 are of the Site Plan, the Sewer Isometric, the Plumbing Plan and the Floor Plan.

Along with the drawings that were found an on site inspection was completed on 29 Nov 07 with the current facility manager, SSgt Gilmore. A new Security Forces Kennel area has been built and now the building is currently being used to house animals until they can be transferred to Alamogordo Animal Control.

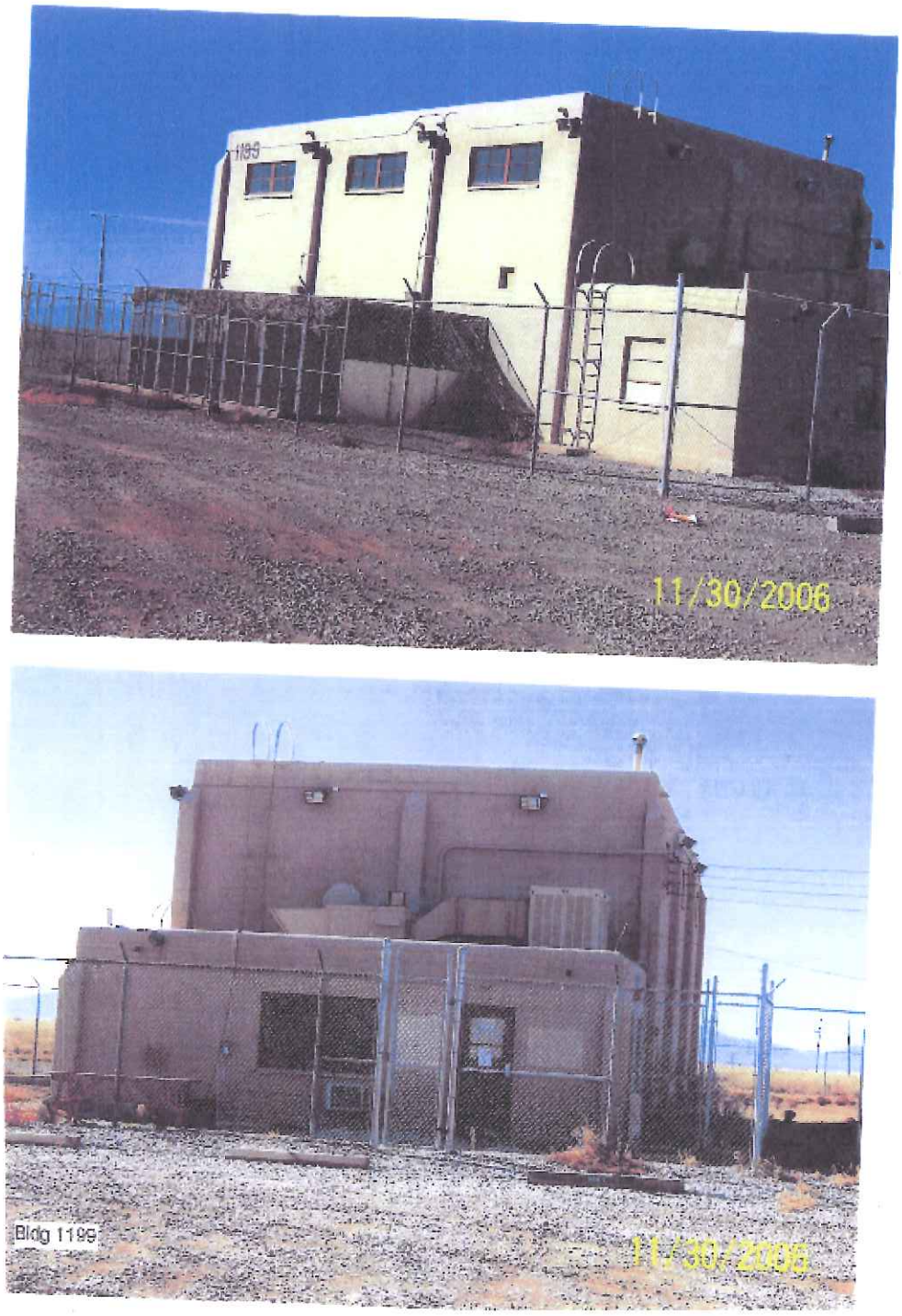


Figure 7: Pictures of Bldg 1199

INACTIVE SEPTIC SYSTEMS

BUILDING 1200

Specifications and History: See "Cold War Survey".

Three drawings were found for this building. These drawings show the Plumbing Floor Plan (Attachment 14), a Floor Plan (Attachment 15) and the Septic Tank and Drain Field (Attachment 16).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab, Medical (VACANT).
Historic: Space Biology Laboratory.
Street Address: 841 Douglas Road, HAFB, 88330-7823.

Building Number: 1200

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [ ] Needs maintenance [x] Deteriorated [ ] Archaeological

Comments: Building 1200 is abandoned, and showing signs of deterioration.

Degree of Alteration: [ ] None [ ] Minor [x] Moderate [ ] Major

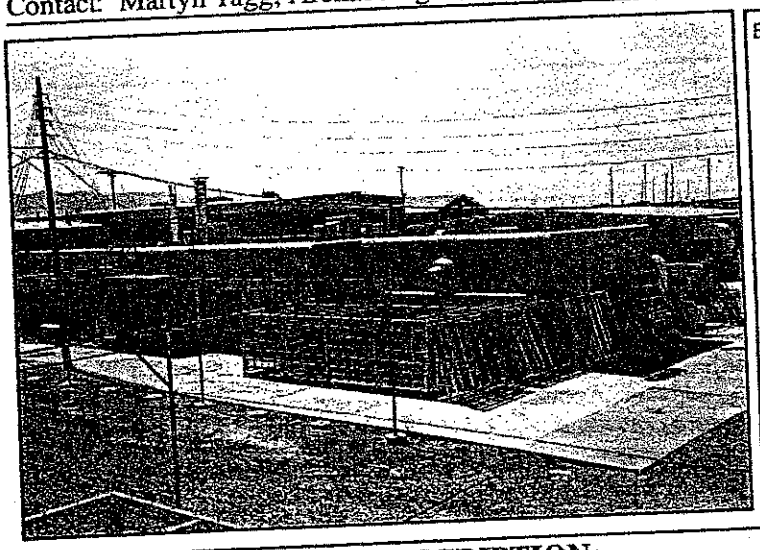
Comments: Alterations are architectural rather than structural.

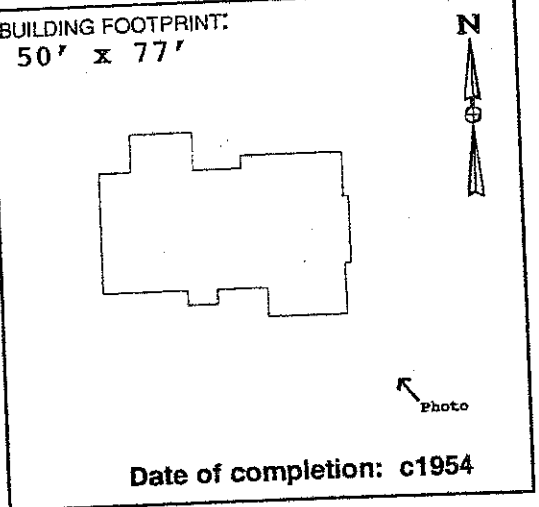
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1200 no longer retains historic integrity. See Section VI.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1954

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II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1200 is a rectangular, single-story, flat-roofed concrete masonry unit (CMU) building constructed as one of several laboratories dedicated to important aeromedical research using both animals and humans. None of the construction drawings were correctly stamped "As-built." According to Real Property Accountable Record/1200, the estimated date of construction is 1954. Subsequent improvements documented in CE File drawer #1200 include an addition to the medical lab (c1958), a covered passageway added to the boiler room (c1957), and a frame wall addition to the surgery room (c1957). Neither the builder nor the architect is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1200; Field visit Summer 1995.

Current Function: Vacant.

Original Function: Space Biology laboratory/Animal experimentation.

Interim Functions: Animal experimentation/Storage.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1200-1 (c1953).

Foundation: Concrete wall footings. Concrete slab on fill.

Exterior walls: Painted concrete masonry units (CMU).

Roof: BUR on concrete deck, supported by metal lathe and steel bar joists.

Notable interior features, including machinery:

Originally used as a medical laboratory, with work tables, work benches, built-in lockers, cabinets, operating tables, x-ray tables, etc.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:

274

One room is currently being used for storage. All medical and laboratory equipment has been removed.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Due to extensive alterations to the exterior, Building 1200 no longer retains historic integrity. Recommend, however, that this building be considered as a contributing feature in a basewide early Cold War National Register of Historic Places Multiple Property nomination.

VII. ASSOCIATED BUILDINGS:

Building 1200 was an integral part of Holloman's aeromedical facilities, including Buildings 1201, 1202, 1203, 1204, 1205, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Since its original construction c1954, Building 1200 has been used as a laboratory and medical facility for a wide variety of research animals, including trout, black bear, dogs, mice, and chimpanzees. Although currently abandoned, this building featured a lead-lined x-ray room, an autopsy room, an observation room, a surgery room, a dark room, and animal pens (c1954: CE File #1200-1). Built-in steel lockers, metal cages, x-ray tables, work benches, food bins, operating tables, scrub sinks, surgical lamps, sterilizers, etc. have been removed. Two exterior doors have been blocked in, and thirteen exterior windows have been blocked in. One exterior door and one exterior window have been added. Interior walls have been added, removed, or relocated. A storage room has been added to the south elevation. Animal cages remain at the west elevation. The presence of dead rodents, foul odors, torn pipe and duct insulation (possible containing asbestos) and peeling paint (possible lead-based) represent hazards to health and safety. Because of the unique and important nature of the research conducted here, recommend that this building be nominated as a contributing feature as part of an HAFB early Cold War National Register Multiple Property nomination.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?
[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.
Comments: The building has been located at its present location since c1954.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?
[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact
Comments: Most of the original doors and windows have been removed. All of the equipment has been removed. Most of the original finishes have been obscured.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting
To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting
Comments: Continues to be situated in an isolated setting with the other Aeromedical facilities.

Materials: To what extent have the original materials used to construct this structure been retained?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Elevations have changed due to modified openings, an addition, and a covered passageway. Interior wainscot and cornice removed, wall tile added.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Exterior walls and cages remain intact. Some architectural features remain. Most of the original interior workmanship has been lost.

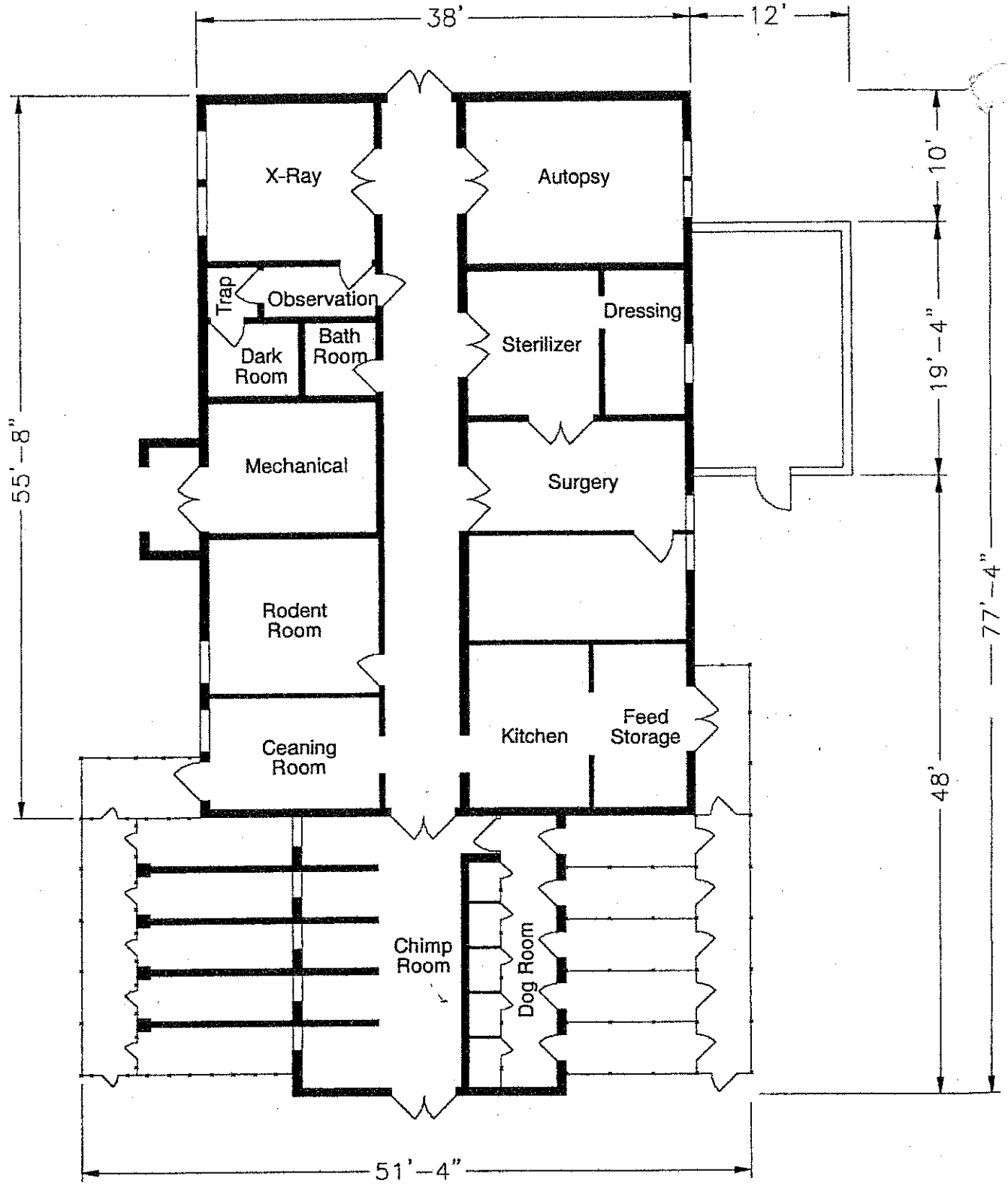
Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?
[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity
Comments: Building 1200 continues to be situated within the compound set aside for animal research. Chimpanzee research continues today in nearby buildings.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?
[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity
Comments: Although all of the equipment has been removed, this building still demonstrates a link with its past by virtue of its setting, the odors, and the animal cages.

X. FURTHER INFORMATION:

Surveyed By:
Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #94**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1200-1 (c1954)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1200** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

BUILDING 1201

Specifications and History: See "Cold War Survey"

Seven drawings were found for this building. These drawings show the Septic Tank and Absorbent Area Layout, Isometric Sewer Layout, Septic Tank Plan and Septic Tank Elevation (Attachment 17), Floor Plan (Attachment 18), Layout Plan (Attachment 19) and Systematic-Waste System (Attachment 20).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab Medical.
Historic: Aero. Medical Field Lab.
Street Address: 821 Douglas Road, HAFB, 88330-7823.

Building Number: 1201

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Structurally intact. In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

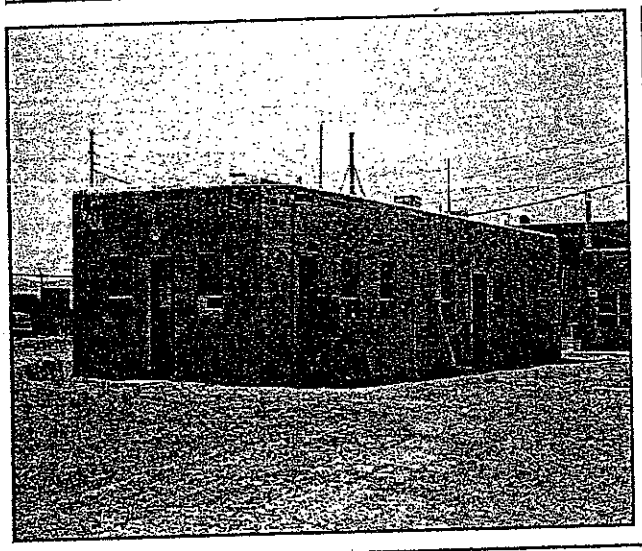
Comments: Mortuary/autopsy room added as subsequent improvement c1958.

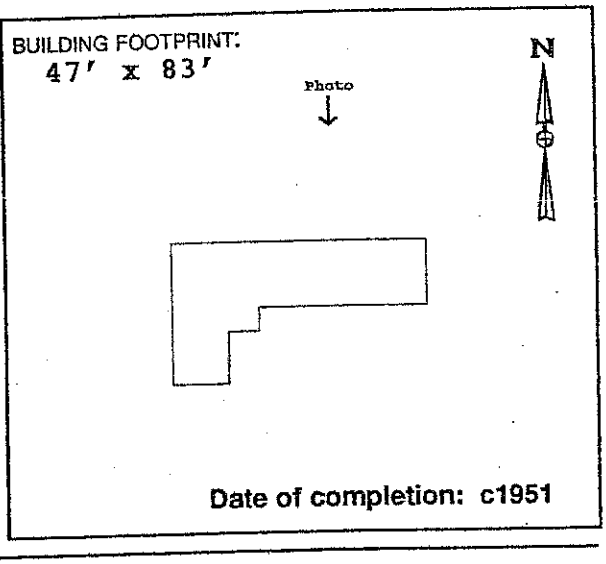
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible under Criteria A and/or C at a national level.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1951

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1201 is an "L-shaped", single-story, flat-roofed, building constructed primarily using painted 8" structural clay tile and exhibiting asymmetrical door and window placement. Animal cages occupy the west elevation. Real Property Accountable Record/1201 indicates that this science laboratory was constructed c1951. The construction drawings consulted were stamped "As-Built," although no date was given. Both the architect and builder are unknown.

At least two structural modifications may be viewed as subsequent improvements to the original building, including the addition of a Mortuary/ Autopsy Room (c1958: CE File #1201-4), and the addition of a rooftop observation deck (c1952: CE File #1201-5).

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1201.

Current Function: Carpentry shop; Employee break room; Office space.

Original Function: Aerospace Medical Lab; Animal experimentation.

Interim Functions: "SC Lab Human Eng" (n.d.); "SC Lab Med (c1968).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1201-1 (c1951).

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted structural clay tile.

Roof: Built-up roof w/ gravel on sheeting, supported by 2x12 wood joists.

Notable interior features, including machinery:

Fixed chain link cages, lab tables, equipment tables, work tables, wood storage bins, sterilizer, incubator.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL: (Based on field visit Summer 1995

[c1958 SUBSEQUENT IMPROVEMENT--MORTUARY/AUTOPSY]:

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted cement masonry unit (CMU).

Roof: 5-Ply built up roof on concrete slab. Steel joists.

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Notable interior features, including machinery:

Washer and dryer, kitchenette, tool room, table saw, furniture, lockers.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1201 is eligible to the National Register under Criteria A and/or C at a national level of significance for its vital role in early aeromedical research in support of the early Cold War space exploration mission.

VII. ASSOCIATED BUILDINGS:

Building 1201 was associated with the other Aeromedical facilities, including Buildings 1200, 1202, 1203, 1204, 1205, 1206, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1201 retains historic integrity as far as the structure itself goes. Very little physical evidence remains of this structure's original use as an animal laboratory. The cages have been removed. Two interior walls with doors have been added. One interior wall has been removed. Service sinks, work tables, wooden bins, an incubator, and other lab support items shown on c1951 construction drawings have been removed. An area of the original roof approx. 10' x 13' was reinforced with three inches of concrete for observation deck c1952 (CE File #1201-5). A mortuary/autopsy room was added c1958. These additions may be viewed as early improvements, and do not diminish Building 1201's historic integrity. Drawings itemize a "2-body" mortuary room, an autopsy table, a band saw, cabinets, a sterilizer, a photography area, and other laboratory equipment. This equipment has been removed. This room currently serves as a lounge area for employees. Due to the important research conducted here in support of this nation's space program, further research is warranted. Recommend that Building 1201 be included in a Cold War-era Multiple Property nomination. Suggested routine maintenance: This building is showing the signs of long-term neglect. Fill the stress cracks at the exterior corners. Scrape and paint exterior walls. Replace window glass and door hardware as needed.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Continues to be situated in an isolated compound.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Original structure essentially intact. Interior lab equipment and cages removed.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Enclosed by chain link fence topped with barbed wire, along with other research facilities. Chimpanzee research continues in nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Clay tile walls still intact. Some glass block windows remain. Some glass block windows blocked in when addition constructed. Floor tiles removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Roof, walls, and exterior openings remain essentially the same. The east elevation changed due to an early addition. Interior partitions, openings, and finishes have changed.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Historic photographs show that the natural, historic, and aesthetic character of Building 1201 has been retained.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

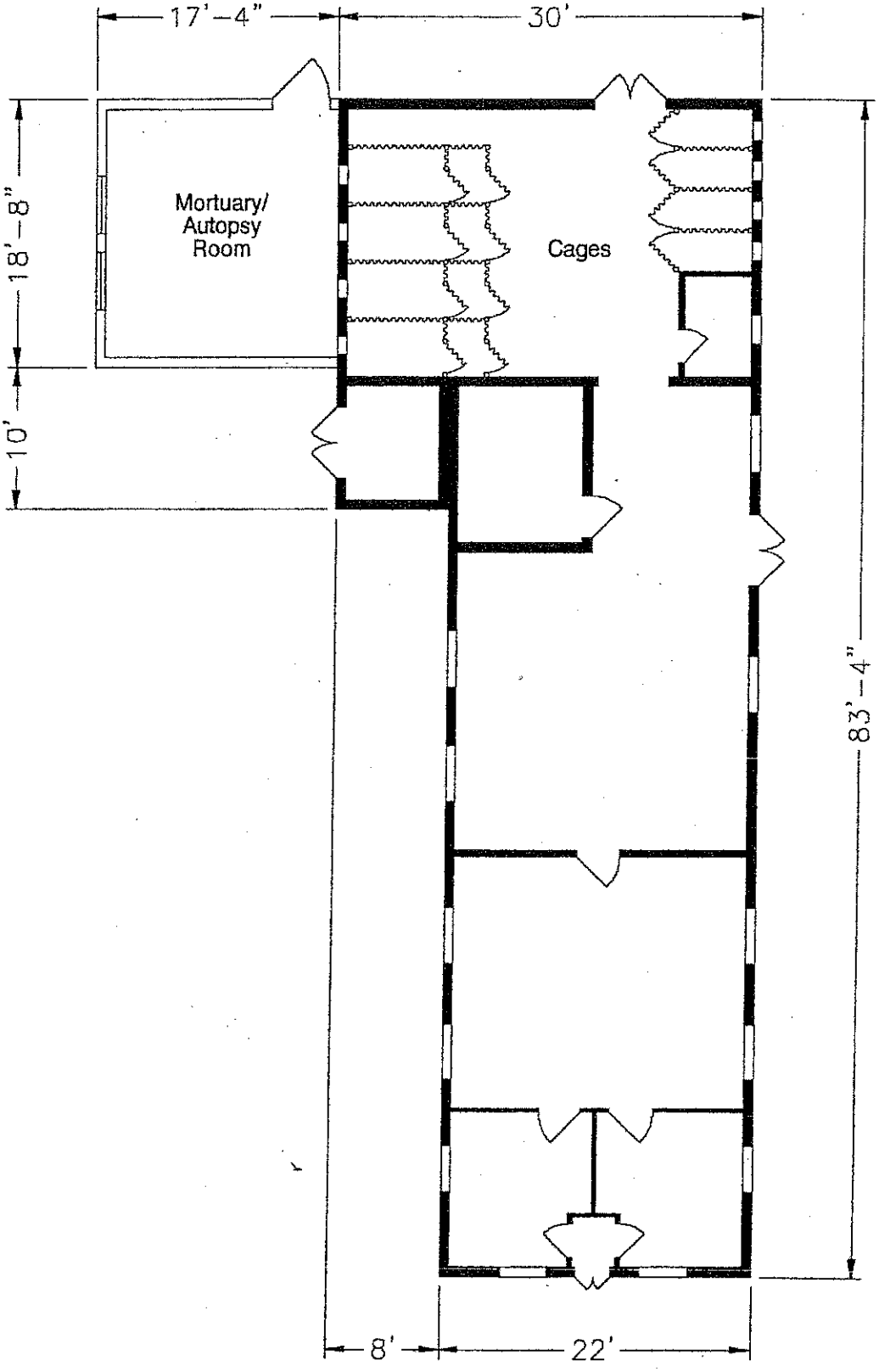
Comments: Building 1201 retains a visible link with its period of significance.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #91**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1995**



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Source: CE File #1201-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1201** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

Buildings 1219, 1221, 1235 and 1239
An on site inspection was completed on 20 Dec 07 with the current facilities manager, TSgt Pote, he has been the facilities manager for the past nine years. During the inspection it was discovered that there are sink holes on all leach fields in the compound. All buildings in this compound have separate drains for the bathrooms. All buildings are also currently connect to the base sewer system.
Attachment 55d shows the leach field location for Buildings 1219, 1221, 1235 and 1239.

BUILDING 1219

This building is the Administrative Offices for the Munitions Maintenance Squadron. It was constructed in 1985 and covers 4476 SF.
There are Men's and Women's Bathrooms that discharged into two (2) septic tanks prior to the installation of a sewer main that discharges to the Base Waste Water Treatment Plant.

INACTIVE SEPTIC SYSTEMS

Building 1221

This building is in the Ammo Depot and was originally constructed for ammunition storage. It was later switched to store inert munitions.
The building was constructed in 1983 and covers 2857 SF.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan (Attachment 21), Floor Plan (Attachment 22), Partial Plan (Attachment 23), Septic Tank Details and Sewage Disposal System (Attachment 24) and a Profile of Sewer Line Septic Tank and Disposal Field (Attachment 25).

INACTIVE SEPTIC SYSTEMS

BUILDING 1226

This is a munitions maintenance shop building constructed in 1985. It has 2945 SF of floor space.
Facilities installed include:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Utilities Plan (Attachment 26), Plumbing Demolition Plan (Attachment 27), Plumbing and HVAC Plan (Attachment 28) and Waster/Water Piping Detail (Attachment 29).

In Figure 8 on the following page it can clearly be seen where the leach field is in relation to where building 1226. This is the leach field for building 1219, 1221, 1235 and 1239 as well. In Attachment 46 (a map showing many of the building on Holloman AFB) it can be seen where building 1226 is in relation to these building.

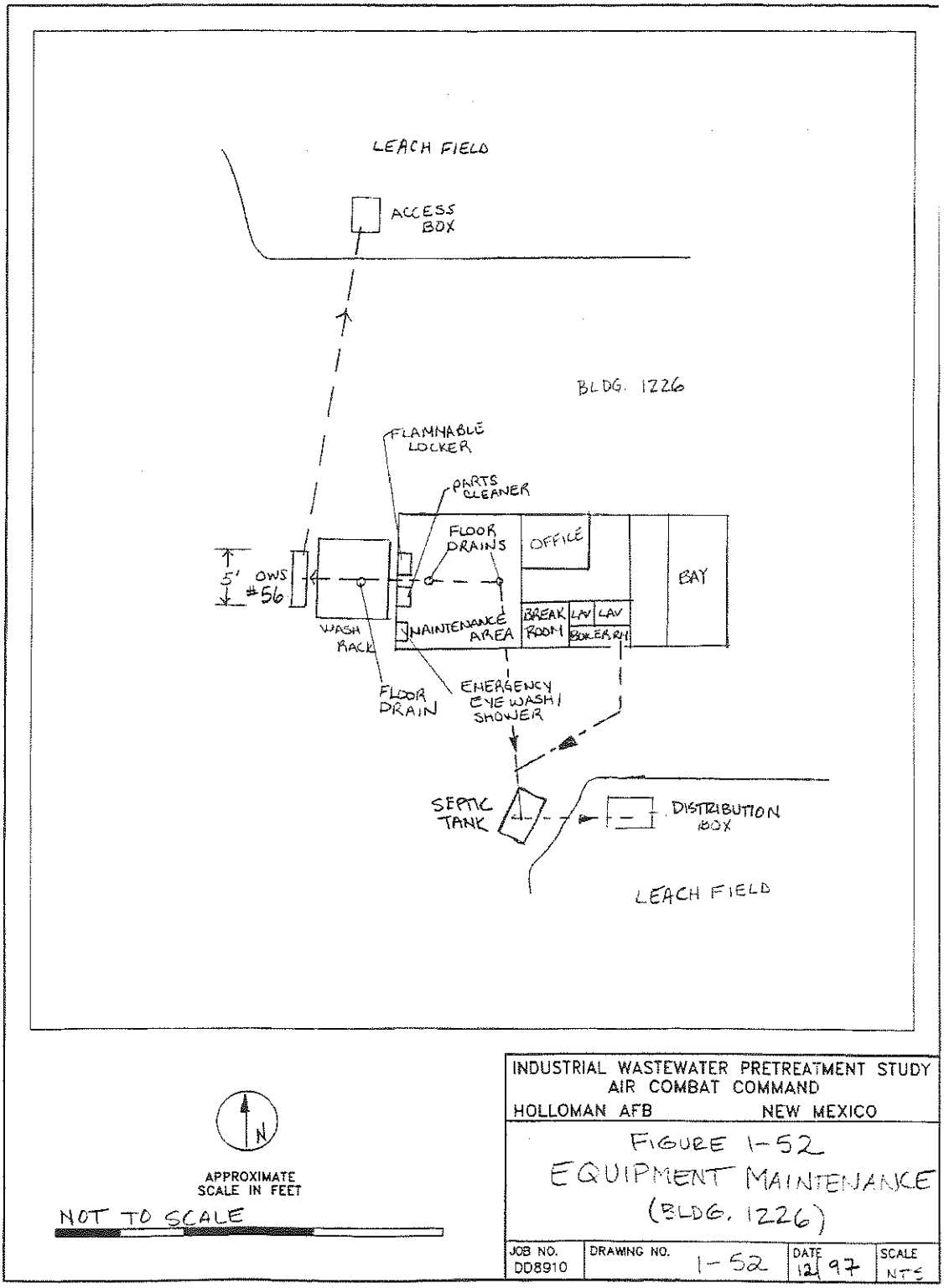

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Figure 8: Drawing of Leach field

INACTIVE SEPTIC SYSTEMS

BUILDING 1235

This building was constructed in 1964 and contains 3000 SF of floor space.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, a drawing for this building was also located. This drawing (Attachment 30) shows the Site Plan, Septic Tank Details and Sewer Clean Out.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST

INACTIVE SEPTIC SYSTEMS

BUILDING 1239

This is another building in the Ammo Depot. It was constructed in 1971 and contains 1920 SF.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Urinal
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan, Septic Tank Details, Utility Plan (Attachment 31), Floor Plan (Attachment 32), Grading Plan (Attachment 33) and Lavatory Detail (Attachment 34).

INACTIVE SEPTIC SYSTEMS

BUILDING 1250

This building was constructed in 1957 and contains 2890 SF.
It was originally a water pumping station. In 1985 it was changed into a storage facility. As part of the change in service the bathroom facilities were removed. Currently it has a large infestation of vectors and it is unsafe to go inside. The POC for this building is Mr. Chuck Price.
The original facilities consisted of:

- Toilet
- Lavatory
- Floor drains for the water pumps

INACTIVE SEPTIC SYSTEMS

BUILDING 1251

This building was constructed in 1965 and contains 1300 SF.
In the records it is listed as a Research and Testing Shop. It currently has a large infestation of vectors, therefore it is not safe to go inside. The building has been vacant since the mid 90's. The point of contact for this building is Mrs. Eisele.
It contains the following facilities:

- Toilet
- Lavatory

INACTIVE SEPTIC SYSTEMS

BUILDING 1269

This building was constructed in 1966 and contains 3262 SF.
The original service was a Medical Science Laboratory. It has been relegated to a storage facility.
The facilities consisted of:

- Toilet
- Lavatory
- Kitchen Sink with Garbage Disposal

Site Specific Contingency Plan: See Attachment 1

Max. Spill Quantity (gal): 55

Chemical	Container Type
Benzene	NA
Acetonitrile	

REMOVED SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	1102	1952	6'x4'x8'10"	2500
2	1103	1948	7'x9'x3'2"	1412
3	1108	1958	6'x9'6"x6'3"	750
4	1119			
5	1150	1953	4'x9'x6'3"	2500
6	1154			
7	1166	1960		450
8	1175	1949	5'1"x10'4"x6'10"	2970
9	1176	1959		640
10	1265	1992		1200
11	1173			

REMOVED SEPTIC SYSTEMS

BUILDING 1102

Specifications and History: See "Cold War Survey." More information can be seen in the drawings. The drawings that have been found for this building are as follows the Grading Plan (Attachment 35), Septic Tank Details and Boring Log Results (Attachment 36), Leaching Well and Cover Details and Sewer Clean Out (Attachment 37).

Attachment 55c shows where the leach field was located for this building in 1984.

This building has the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Missile Radar Station.
Historic: Radar Triangulation: King I.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1102

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

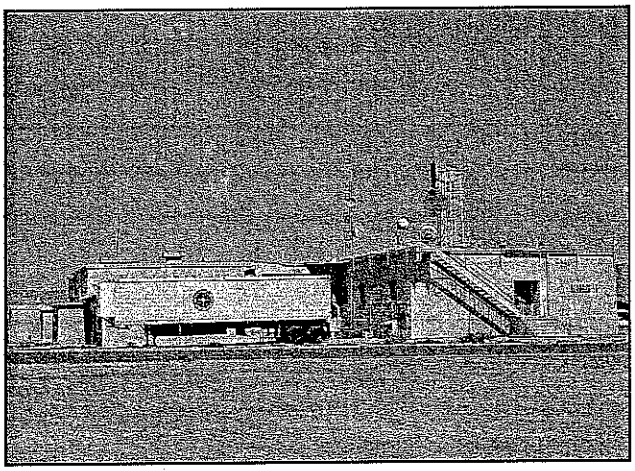
Comments: Essential structural and architectural features remain intact.

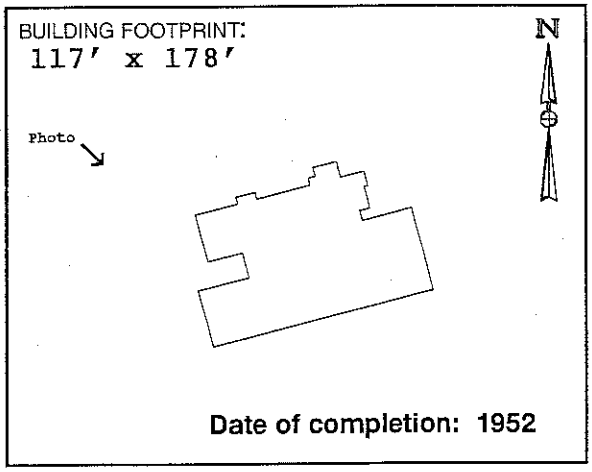
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Recommend listing as part of a Cold War Multiple Property.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1102 is a one-story concrete masonry unit, multi-shaped building with a central corridor running east-west the entire length and single rooms flanking both sides of the corridor. Original footprint shows primarily rectangular shape with a central projecting core. This core is a large open room with an upper balcony around its perimeter. Construction of the original building was completed in 1952, according to "As-built" drawings in CE File #1102-1. Surveillance display room added in 1969 (CE File #1102-1). It is unclear when north elevation additions constructed, although information in Real Property Accountable Record/1102 date the additions as being post-1970. The architect for this project was W. C. Kruger (Santa Fe, NM). The builder is unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1102.

Current Function: Telemetry and Optics. Altitude measurements.

Original Function: Missile Instrumentation Station; Mission Control.

Interim Functions: Missile Radar Station.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1102-1 (c1952).

Foundation: Concrete footing and foundation wall. Column spread footing.

Exterior walls: Concrete masonry units (CMU).

Roof: Bituminous concrete over built-up roof, ltweight concrete, supported by one-way concrete slab using concrete beams and steel beams encased in concrete.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

380

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Eligible under Criteria A and/or C at a national level of significance for important role in early Cold War-era missile and High Speed Test Track mission control and tracking. Further research recommended.

VII. ASSOCIATED BUILDINGS:

Building 1102 supported all missions at White Sands Missile Range and at Holloman Air Force Base until Building 300 and possibly 1527 at White Sands were constructed.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1102 continues to operate as a mission control building, with mostly optics and telemetry functions. The Flight and Instrument Control Room, and the Surveillance Radar rooms are vacant. Originally, missiles were fired using an analog boards (mechanical) system. When operations changed to a digital system in c1978, support moved from the central instrument control room to the north addition off of this room. Nearly all of the original interior finishes remain unchanged.

Suggested routine maintenance: Scrape, prime, and paint all block and concrete surfaces. Remove vegetation and rusted pipes by gas meter. Fill depressions at foundation, and regrade using gravel to promote positive drainage. Fill holes at concrete stoops. Replace wood bumper at dock using similar-sized lumber. Secure panel covers on abandoned electrical panels. Enclose live connections in junction boxes. Scrape, prime, and paint metal stairs. Reattach stair nose treads. Remove miscellaneous debris from building perimeter.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Still situated at the northeast corner of the intersection of Tula Peak Road, and Douglas Road.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The original floor plan remains intact.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Continues to be situated at the intersection of two roads in an isolated setting with few nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Most all original materials have been retained at both the exterior and the interior.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: All original exterior and interior room finishes remain visible. At the south elevation, one window is blocked, one window has been replaced with a door, and the door at the loading dock has been replaced. Most of the north elevation is obscured by the addition of an operations room.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1102 continues to support limited mission control operations.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

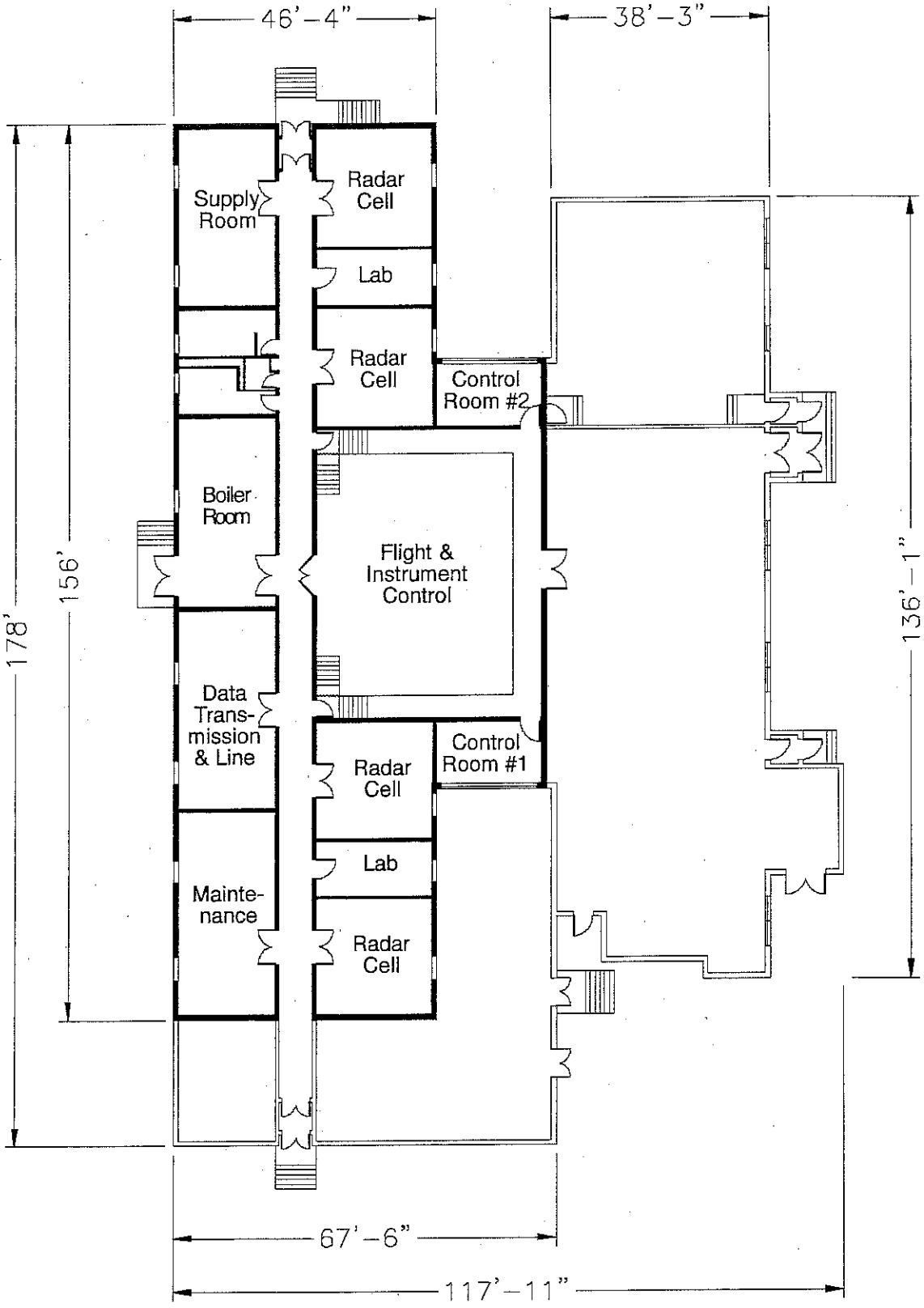
Comments: Building 1102 retains an evident link with its aesthetic and functional historic character.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #49**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1102-1 (c1952)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1102** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-6401* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1103

Specifications and History: See "Cold War Survey" the Layout Plan (Attachment 38) has also been provided.

Attachment 55c shows where the leach field was located for this building in 1984.

Facilities: This building contains the following facilities.

- Tiolets-2
- Urinals-2
- Lavatories-3
- Service Sinks-3

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Timing.
Historic: Telemetering Building.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1103

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance only.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

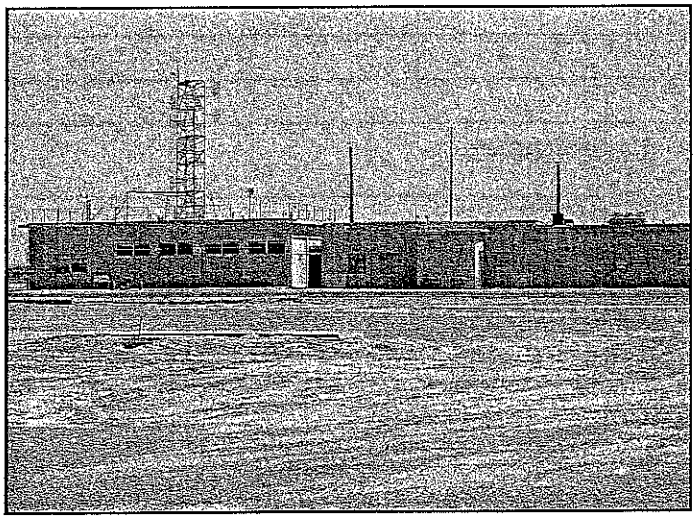
Comments: Few alterations since early improvements.

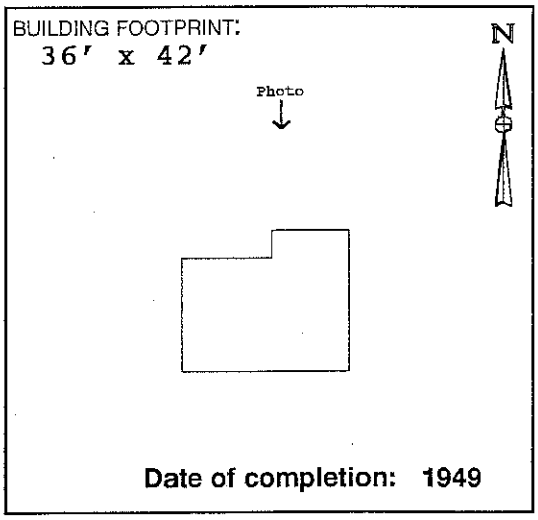
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Research recommended to determine historic use. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1103 is a one-story rectangular building with concrete masonry unit walls, and a flat roof. The original building was completed in 1949, according to "As-built" drawings located in CE File #1103-1. This original construction is centrally located, flanked to the east and west by subsequent additions. Real Property Accountable Record/1103 documents the addition of 2,930 square feet to the original building with the notation "Subsequent Improvements thru May 57." One or both additions to the original building may therefore be considered to be subsequent improvements, rather than additions that compromise historic integrity. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE: (Personal communication with Building 1103 personnel)

Current Function: (East end) Leased by WSMR to transmit mission timings.

Current Function: (West end) Unknown.

Original Function: Telemetering station for data collection of Range missions.

Interim Functions: Real Property Accountable Record/1103: "Communications CTR" (c1962); "Telecom Cen" (c1971); "Comm Fclty" (c1980); "Elec Rsch Rdr" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1103-2 (1967); CE File #1103-1 (1949).

Foundation: Concrete wall footing.

Exterior walls: Painted concrete masonry units (CMU).

Roof: Built-up roof on wood sheathing and 2 x 8 wood joists.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Although perhaps not meeting the "exceptional importance" stipulation imposed on buildings constructed within the last fifty years, Building 1103 may be eligbile for the National Register under Criterion A at a regional or national level in the year 1999. If further research determines that Building 1103 is not eligible as an individual property, consideration should be given to its eligibility as a contributing feature in a Cold War Multiple Property submission for its support of early Cold War-era test launches.

VII. ASSOCIATED BUILDINGS:

Building 1103 was associated during its historic period of significance with Building 1102, mobile data collection vans, and Building 300 at White Sands Missile Range.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1103 appears very different today from depictions on "As-built" drawings dated 1949. It is unclear whether additions to the east and west ends of the original building represent early improvements to the original building, or whether these additions represent later construction that has compromised the historic integrity of the original building. Information obtained from Real Property Record/1103 and field visits seems to indicate that the additions represent early improvements to the original building. If so, Building 1103 retains historic integrity. Further research is needed to verify the construction sequence, and to verify what early Cold War-era research activities were supported by Building 1103. Currently, Building 1103 is leased by the White Sands Missile Range. Aside from minor partitioning at the telemetering room, the original floor plan of the original building shows no alterations. Wood posts (6 x 6) that appear on original drawings to support the roof girders have been removed.

Suggested routine maintenance: Repair, or replace in kind, the exterior wood architectural features, including the soffit, fascia, wood doors, and louvers. Patch spalling concrete at foundation. Remove vegetation at roof.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Original telemetering room is now used as spare equipment storage.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Earlier location plans indicate three utility buildings situated in a row next to Building 1103 to the east. These buildings have been removed. Continues to be set in a somewhat isolated setting, in the vicinity of King-I.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Unable to access some rooms. Those rooms that were accessed, however, appear to have most of the original materials intact. A brick chimney and a metal stack have been removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original windows at north elevation have been covered up at the interior. The telemetering room has been partitioned (reversible).

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity

Comments: Building 1103 personnel are actively engaged in serving as a timing link for White Sands Missile Range tests.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

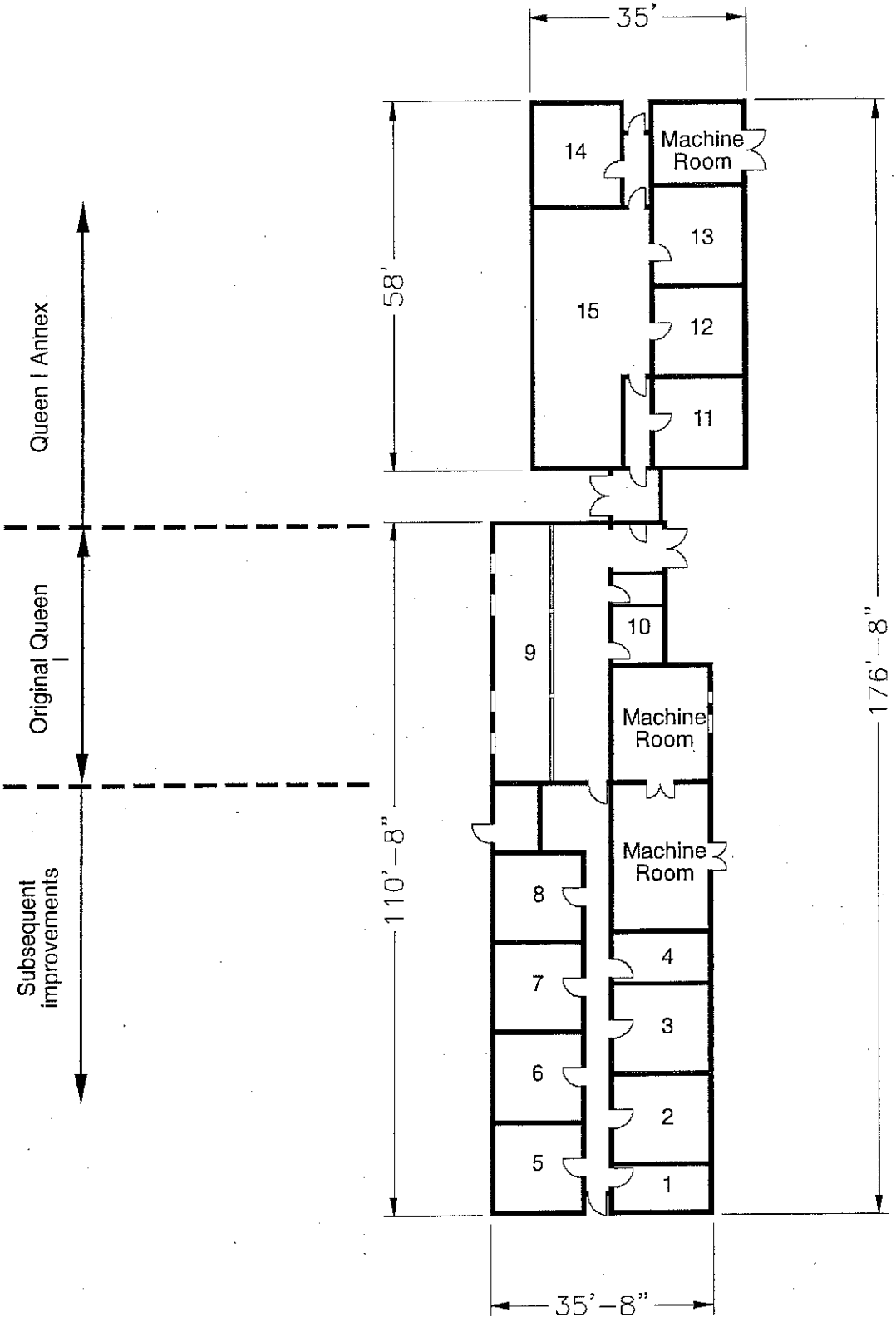
Comments: Building 1103 continues to provide support to the White Sands Missile Range.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #47**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: Dynalectron *Facilities Handbook*, c1964.

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1103** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1108

This building was constructed in 1958 and contains 2626 SF of floor space.
The building was originally built to serve as the telephone exchange. In 1980 it was retitled as a communications facility.
The building contains the following facilities:

- Toilet
- Lavatory
- Janitorial Sink

The drawings provided (Attachment 39-40) show a Utility Plot Plan, Septic Tank Details, Sewer Clean Out, Toilet Room Details and Plan Details.

Attachment 55e shows where the leach field was located for this building in 1984.

Site Specific Contingency Plan: See Attachment 1 and 2

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate into local area on ground

Tank location: North of facility

Fuel Flow - North

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST
MOGAS	250 gal each/ 2 /AST

REMOVED SEPTIC SYSTEMS

BUILDING 1119

This is an Army owned building that contains 2224 SF of floor space. Use and maintenance of the building was transferred to the Air Force in 2005. Prior to the Air Force taking possession the Army had delegated the building to the GSA for use as a vehicle maintenance shop. Once the Air Force took over, the building changed service to an electrical shop and storage facility.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
Diesel	250 gal ea/ 3 /AST
MOGAS	250 gal ea/ 2 /AST
Diesel	750 gal ea/ 3 /AST

Figure 9: Picture of Bldg 1119

REMOVED SEPTIC SYSTEMS

BUILDING 1150

This is also an Army owned building and therefore details are lacking from Holloman's records. The building has 2844 SF.
The original service is unknown, but since the Air Force started using the building it has been used as storage space.
It contains the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 9: Drawing of Bldg 1150

REMOVED SEPTIC SYSTEMS

BUILDING 1154

This is an Army owned building and there is no information in Holloman's files pertaining to this building.

Attachment 55c shows where the leach field was located for this building in 1984.

REMOVED SEPTIC SYSTEMS

BUILDING 1166

This building was constructed in 1960 and contains 4955 SF. The structure is a Test Track Shop/Storage Building known as the "Break Setter Building".
The facilities include:

- Toilets-2
- Urinal
- Lavatory
- Shower

Attachment 41 is a drawing showing the sewer layout and the septic tank details.

Attachment 55c shows where the leach field was located for this building in 1984.

Site Specific Contingency Action: See Attachment 3

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate in local area on ground; if full tank or drum spilled' the substance may reach open ditch.

Material Compatibility: No material incompatibilities

Chemical	Container Type
Oil/Water Separator Waste	500 gal/ 1 / UST

Figure 10: Picture of Bldg. 1166

REMOVED SEPTIC SYSTEMS

BUILDING 1175

Specifications and History: See "Cold War Survey"
Facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

In Attachments 42-44 a trench pit, the toilet room details, the trench junction to UPS, the sanitary sewer manhole and water and sewer piping can be found for Bldg 1175.

Attachment 55c shows where the leach field was located for this building in 1984.

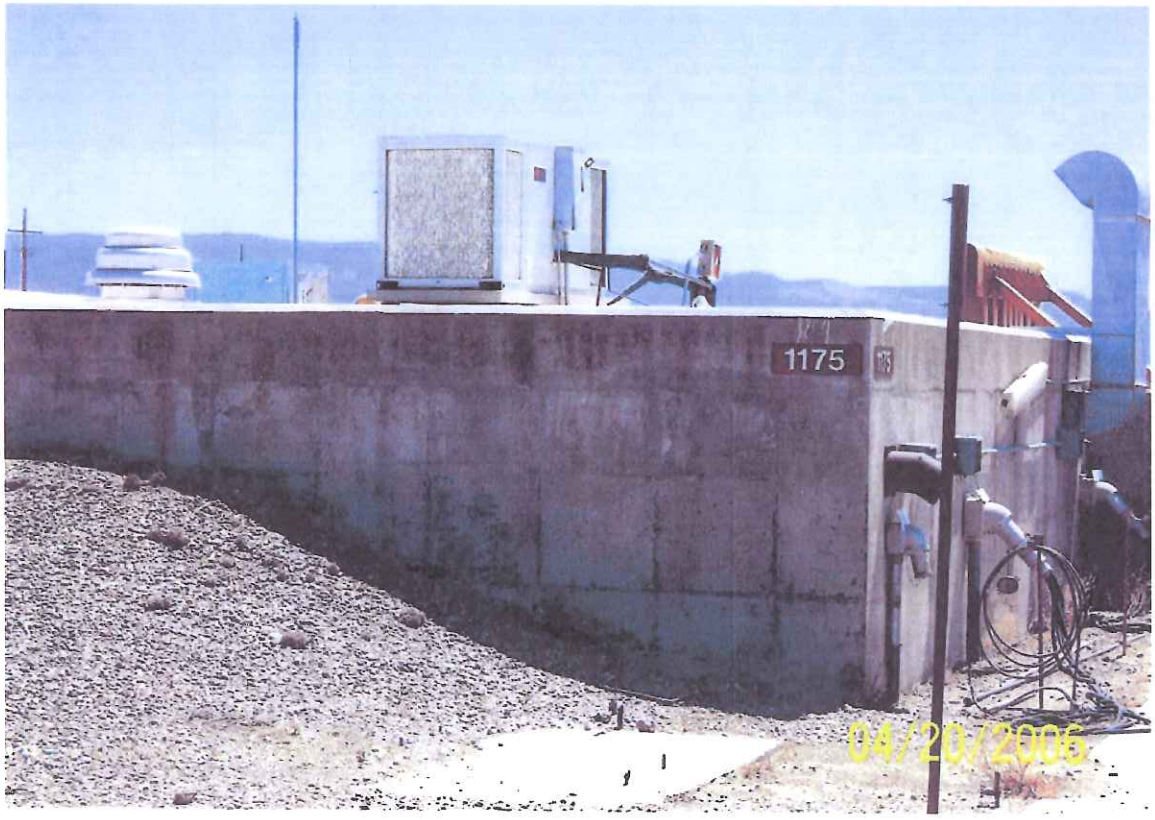


Figure 11: Picture of Bldg 1175

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Blockhouse--"Alpha".
Historic: Blockhouse--"Alpha".
Street Address: 1656 Test Track Rd., HAFB, 88330-7848.

Building Number: 1175

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1175 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

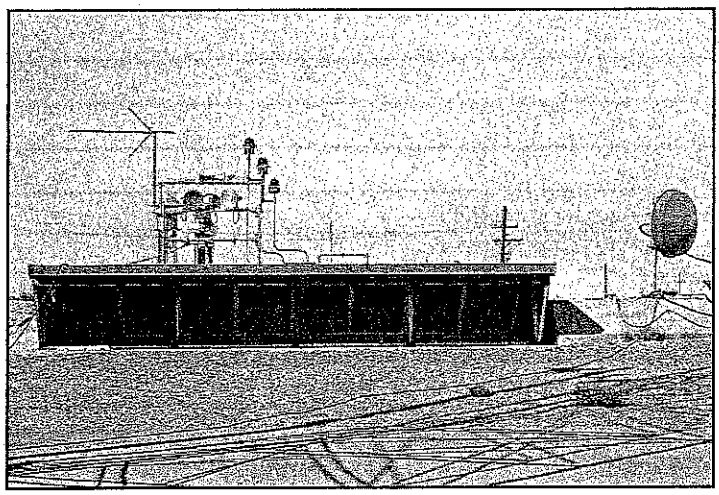
Comments: Modernization at interior to enable continued Test Track use.

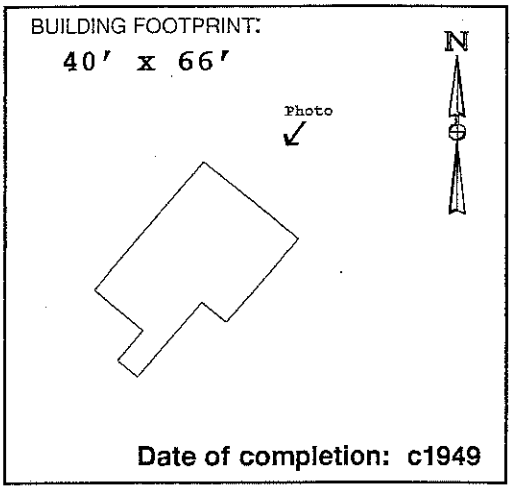
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible for the National Register under Criteria A and/or C.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1175 is an irregularly shaped, one-story concrete structure, built mostly below grade. The building is accessed by a ramp leading down to double doors at the southwest elevation. These doors access the original launch control room constructed in c1949. This entrance, three entrances off of the ramp, and windows facing the track (northeast) are the only visible openings. A 15′ x 32′-6″ addition was constructed at the northwest elevation in 1960 (CE File #1175-2). Another addition, adjacent to northwest side of ramp was completed in 1981 (CE File #1175-3). The ramp extension was also constructed at this time. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1175; CE File #1175-1 (c1949).

Current Function: Launch control facility, High Speed Test Track.

Original Function: Launch control facility, High Speed Test Track.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1175-1 (c1949); CE File #1175 (c1980).

Foundation: Concrete footings.

Exterior walls: Reinforced concrete.

Roof: 3-foot thick reinforced concrete.

Notable interior features, including machinery:
A long row of thick blast-proof windows faces the track to the northeast.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

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VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

"Alpha" Block house Building 1175 is one of the original High Speed Test Track support facilities, constructed c1949 to provide launch control. Recommend that Building 1175 be nominated under Criteria A and C as part of a basewide early Cold War Multiple Property listing.

VII. ASSOCIATED BUILDINGS:

Building 1175 operated, and continues to operate, in support of the high speed test track launching activities, along with Buildings 1162, 1163, 1161, 1645, and the Horizontal Test Stand facility (Buildings 1159 and 1160).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1175 retains historic integrity. Due to its national level of significance under Criteria A and C, recommend that Building 1175 be listed along with the other test track support buildings as part of a Multiple Property nomination to the National Register of Historic Places.

Subsequent improvements to the original Building 1175 augmented the original design and function as a launch control facility for important research conducted at the high speed test track. The interior was renovated in 1984 (CE File #1175-4). Although this renovation obscures original interior finishes, Building 1175 as a whole retains historic integrity of location, design, setting, workmanship, materials, feeling, and association. Of interest to future researchers may be the dramatic changes in computer technology which have occurred since the construction of Alpha Blockhouse: Computers which at that time required several rooms to house, now occupy considerably less space. Launch control operations continue at Alpha Blockhouse, although rooms designed to hold early equipment are virtually empty.

Suggested routine maintenance: Repair bond beam where steel is exposed. Remove vegetation at exterior embankments. Remove debris at front walkway.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Subsequent improvements to the original floor plan added to Building 1175's design and function as a launch control facility.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Except for the construction of smaller buildings in the vicinity, the original setting of Building 1175 near the test track launch pad has been retained.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: The raised wood floor in the console room has been removed. The original light fixtures have been removed. One wood and glass partition has been removed. Sheetrock® walls, carpeting, wainscot, and linoleum have been added to the control room.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original workmanship at the northeast elevation, and at the entrances at the ramp is still visible. Interior renovations hide the original architectural craftsmanship.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1175 continues to function as a launch control facility for the High Speed Test Track.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

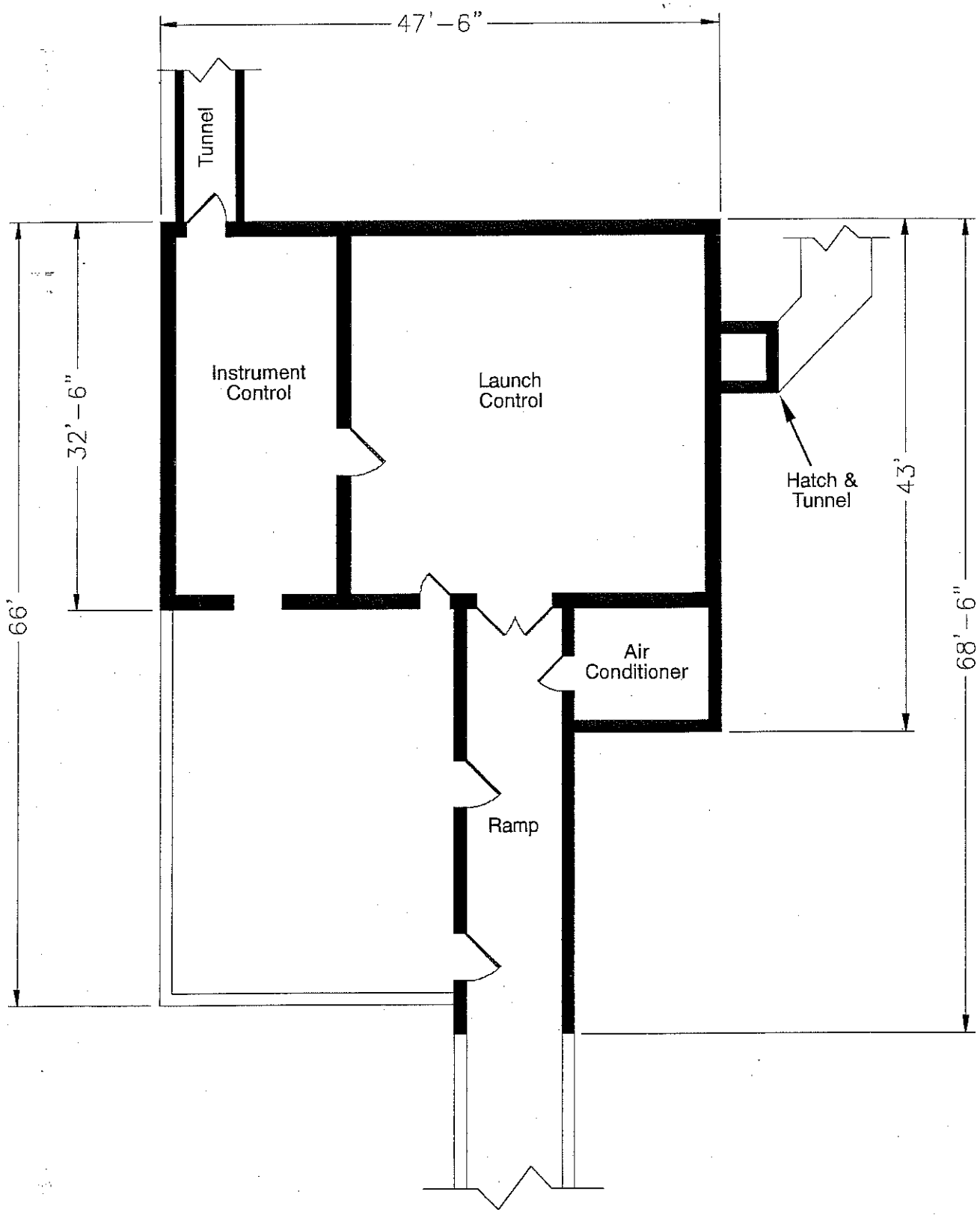
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #35**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1175 (c1980)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1175** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1176

This building was constructed in 1959 and contains 3850 SF.
The building is located at the Test Track and is known as the Sled Launch Shop.
Facilities include:

- Toilet
- Lavatory
- Shower

In Attachments 45-48 a plumbing plan, new drain pit, utility plan, sewer clean out, utilities contour plan and septic tank details can be found for Bldg 1176.

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 12: Picture of Bldg 1176

REMOVED SEPTIC SYSTEMS

BUILDING 1173

This building was constructed in 1957 and contains 17,428 SF.
The building is the main office building at the Test Track.
It contains the following facilities:

- Toilets-8
- Urinals-4
- Lavatories-9
- Janitorial Sinks-2

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 13: Picture of Bldg 1173

REMOVED SEPTIC SYSTEMS

BUILDING 1265

This building was constructed in 1957 and covers 43,388 SF.
This is the Inertial Guidance Facility, previously known as the Guided Weapons Lab.
The building contains the following facilities:

- Toilets-12
- Urinals-6
- Lavatories-12
- Janitorial Sinks-5

This building has been attached to the sewer system at Holloman AFB since before 1984.

In Attachments 49-53 a Water Piping Diagram, Partial Plumbing Plan, Floor Plan, Building, Pavement and Utilities Layout, Sewer Clean Out, and Enlarged Plan can be found for Bldg 1265.

North Wind

Letter No. NW-2008-155

Mr. Dave Griffin
Project Manager
49 CES/CEV
550 Tabosa Ave.
Holloman AFB, NM 88330-8458

11 March 2008

SUBJECT: Technical Memorandum summarizing the decommissioning of inactive septic tanks at HAFB in January of 2008

Dear Mr. Griffin:

Reference Contract Number: W9128F-04-D-0017 DO-0017

Attached please find a copy of the above referenced Technical Memorandum and attached State of New Mexico On-Site Liquid Waste System Abandonment forms. Also attached are copies of the daily reports for the field work.

Please contact me (phone 785-838-3141 or email at tmatzen@northwind-inc.com) or the Program Manager, Rusty Gilbert (phone 210-722-4074 or email at rgilbert@northwind-inc.com) if you have any questions.

Sincerely,

Thomas A. Matzen, P.G.
Project Manager
North Wind, Inc.

Attachments: Technical Memorandum summarizing decommissioning work conducted on inactive septic tanks at HAFB

cc: R. Gilbert (North Wind)
Mr. Tom Zink (USACE Omaha District)
Letter File

North Wind

Technical Memorandum

11 March 2008

To: Mr. David Griffin, Holloman AFB
CC: Mr. Tom Zink, USACE Omaha

From: Tom Matzen, North Wind, Inc

SUBJECT: Decommissioning of Abandoned Septic Tanks Conducted 8 - 24 January 2008 at Holloman AFB

Purpose

This memorandum summarizes the septic tank decommissioning activities conducted on abandoned STLFs from 8 through 24 January 2008 at Holloman AFB.

Description of Work

North Wind, Inc. (NWI) contracted a local septic system installer (Jontel Septic) to decommission 21 abandoned Septic Tanks at Holloman AFB. During the course of the decommission work NWI was requested also to abandon a septic tank at Building 1284 for a total of 22 tanks. North Wind provided a field supervisor to obtain excavation permits, coordinate field activities, and to ensure that quality and safety requirements were met.

Base dig permits were obtained for each of the systems prior to conducting any excavation work necessary to locate the systems. After dig permits were obtained, each system was excavated (if required) to the extent necessary to remove the top of each tank, crush or otherwise perforate the bottom of each tank such that water will not pool in the abandoned tank, and backfill each tank with clean fill per State of New Mexico requirements. Each system was pumped out (if it contained any liquid or sludge), and visually inspected prior to decommissioning.

The required system abandonment forms for each septic tank with accompanying photographs are in Attachment 1. Attachment 2 contains the Daily Progress Report/Quality Control Report Forms. Please note that these forms start at number 29. Forms 1 through 28 were used for daily reporting on the Septic Tank and Leach Field Inspection work.

Interpretation of Findings:

Several tanks were still active and so were not decommissioned. These include the tanks at Buildings 308 (actually an oil/water separator), 1097, 1219, 1226, 1235, and 1239. No septic tanks could be located at Buildings 1200, 1201, and 1269 though we did backfill an earthen pit at Building 1200 and an abandoned sewage treatment plant at Building 1201. Mr. Shawn Quarles, the Base safety person, marked Building 1190 off of the 332 form. Mr. Quarles stated that Building 1190 had been demolished and that there was nothing left at that location. The location of the septic tank at Building 1284 was such that it could not be accessed for demolition. The septic tank at Building 1091 was not abandoned at this time as NWI was unable to obtain a security escort. The tank at Building 1091 will be abandoned while NWI is working on the active septic tank upgrades.

As the abandonment forms indicate, the majority of the septic systems on the original list provided by HAFB were decommissioned per state requirements.

Table 1 summarizes the decommissioning activities and status of the listed septic systems.

Summary of Results

Table 1. Summary of septic system decommissioning activities for abandoned STLFs at HAFB.

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
1	308	01/24/08	Found an oil/water separator still in use.	Notified Base POC that this is an oil/water separator.
2	920	01/16/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
3	921	01/16/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
4	922	01/17/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
5	924	01/17/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
6	1091	01/24/08	Building is in security area. Could not obtain escort.	No action taken at this time. Will decommission tank when we are in the area doing tank replacement work.
7	1097	01/23/08	Found that the septic tank for this building is also hooked into Bldg 1099 and is still in use. Inspected system. This septic tank has no manholes, bottom is damaged and is leaking, no baffle present, leach field is dry and full of dirt.	Turned system back over to active list and inspected system. Inspection form is attached.
8	1190	01/14/08	During the course of obtaining a dig permit for this Bldg the safety person, Mr. Shawn Quarles, marked this one off of the 332 form. Mr. Quarles stated that this Bldg had been demolished and that nothing was left at that location.	Notified Base POC of situation regarding Bldg 1190

North Wind

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
9	1194	01/09/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
10	1196	01/08/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
11	1199	01/09/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
12	1200	01/11/08	No septic tank located. Did locate abandoned earthen pit with a concrete cover. Notified Base POC of situation and received instructions to backfill and abandon.	Removed concrete cover over pit and backfilled pit with clean fill.
13	1201	01/11/08	No septic tank located. Did locate an old abandoned treatment plant. Notified Base POC of situation and received instructions to decommission and backfill the old treatment plant.	Demolished old treatment plant by crushing bottom and caving in sides, then backfilled with clean soil.
14	1219	01/18/08	Septic tank still in use	Notified Base POC that system is still in use
15	1221	01/18/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
16	1226	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.
17	1235	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.
18	1239	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.

North Wind

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
19	1250	01/23/08	Located abandoned septic tank. Also found an old diesel tank still containing fuel.	Opened septic tank, pumped out, crushed bottom, and backfilled tank. Notified Mr. Gomolak at CE Environmental regarding diesel UST.
20	1251	01/23/08	Located abandoned septic tank	Opened tank, pumped out, crushed bottom, and backfilled tank.
21	1269	01/16/08	Could not locate any septic tank. Mr. Vernon (a 30+ year employee) stated that the building had been on the base sewer system for the last 30 years and that the septic tank may have been removed when the moat around the building was removed.	Notified Base POC that there does not seem to be a septic tank at this building.
22	1284 (not on original list, added at request of HAFB POC)	01/16/08	Septic tank hangs over back side of area and is not accessible for removal. This tank is a holding tank with a manual valve that drains to a ditch below. There is no water in the associated Bldg.	Notified Base POC. No action taken.

Future Work

As discussed above in Table 1 the septic tank at building 1091 still must be decommissioned. There are septic systems in that area that require repair and 1091 will be decommissioned when the other septic tanks are being repaired.

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
ON-SITE LIQUID WASTE SYSTEM ABANDONMENT

NMED Permit No.: N/A

System Owner's Name: USCAF

Address: HAFB BUILDING # 1196

BUILDING SEWER:
____ Connected to Sewer Lines or Plugged/Capped based on UPC Requirements

ON-SITE LIQUID WASTE SYSTEM TYPE:
- [x] Septic Tank
- [ ] Seepage Pit
- [ ] Sec./Tert. Treatment Unit
- [ ] Other:
- [ ] Holding Tank
- [ ] Cesspool

ABANDONMENT PROCEDURE:
- V System Pumped
- V Bottom of System Opened or Ruptured or Unit Collapsed
- V System filled with Earth, Sand, Gravel, Concrete, or Other Approved Material
- V Top Cover Removed or Collapsed
- V System Filled to the Top of Sidewalls or above the Level of any Outlet Pipe
- V System Filled Level with Top of Ground Surface

COMMENTS/VIOLATIONS: GPS: N 32 88 74.0
N 106 10 02.7

ABANDONMENT PERFORMED BY:
Company Name: Foutel Septic Co
Address: PO Box 937 Bayard NM 88023

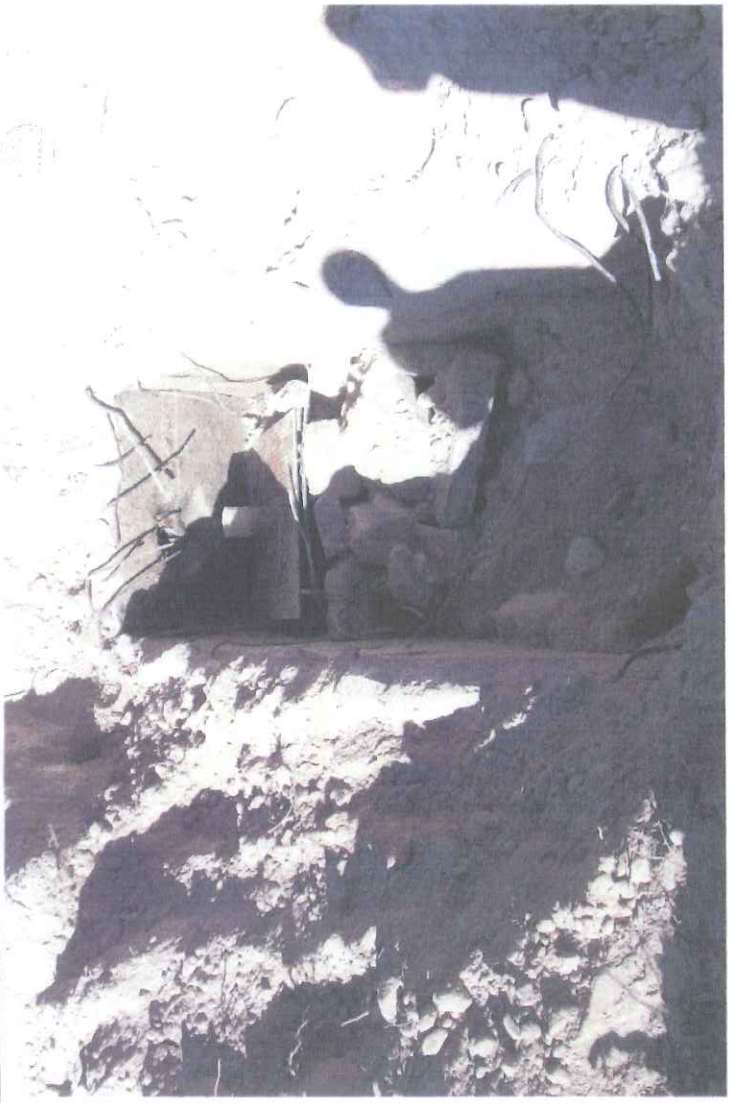
NMED ACTION TAKEN:
- [ ] Abandonment Approved
- [ ] Abandonment Approved w/conditions (See Comments/Violations)
- [ ] Abandonment Not Approved (See Comments/Violations)

FINAL APPROVAL:
- [ ] Granted
- [ ] Not Granted

NMED Inspector Date

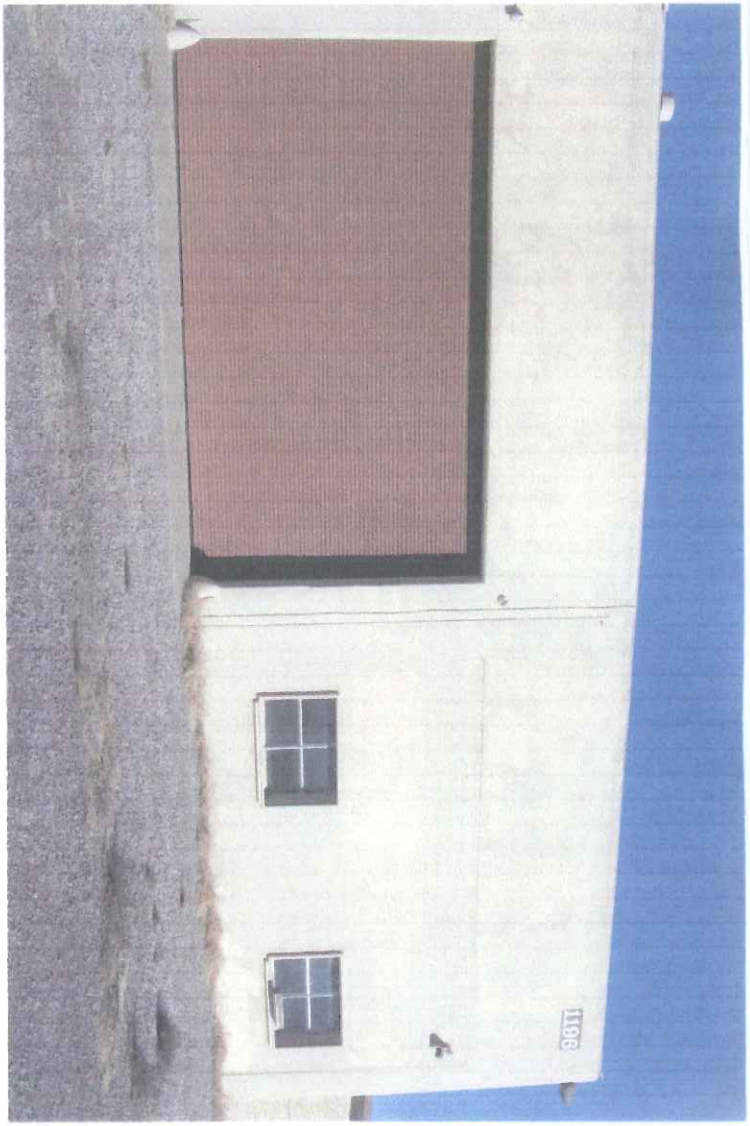
OK - If Abandoned and meets Requirements
N/I - Not Inspected
N/A - Not Applicable
N/C - Not Compliant
N/V - Not Verified

BLDG 119



BLDG - 1196

BLOCK 1196



Appendix B
Photographic Log

Appendix B
Photographic Log
Building 1196 (OT-C535)

Photo No.	Task and Description
1	Building 1196 Location
2	Line from Building 1196 to Septic Tank
3	Inlet, Septic Tank, Effluent Line – Building 1196
4	Septic Tank Effluent Field – Building 1196
5	Effluent Line and Leach Field – Building 1196
6	Leach Field – Building 1196

PHOTO 1: Building 1196 Location

PHOTO 2: Line from Building 1196 to Septic Tank

PHOTO 3: Inlet, Septic Tank, Effluent Line – Building 1196

PHOTO 4: Septic Tank Effluent Line – Building 1196

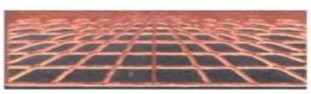
PHOTO 5: Effluent Line and Leach Field – Building 1196

PHOTO 6: Leach Field – Building 1196

Appendix C
Geophysical Report

ULS SERVICES CORPORATION

GEOMARKOUT LOCATING Co a tradename



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---------- *A Veteran Owned Small Business* ----------

5 July 2012

Christopher Long, P.G.
Scientist
Federal Services
Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, TX 77077

Subject: Field Documentation Report for Geophysical Services -
Location of Utilities and Underground Features Associated
With Former UST and Septic System Sites,
Holloman AFB, NEW MEXICO (SHAW PO 783916-000 OP)

Gentlemen:

This report documents the recent Geophysical Survey field work ULS Services Corp completed at the subject site On and between the dates of 11 June 2012 thru 23 June 2012.

SHAW / ULS SERVICES CORP
GEOPHYSCIAL SERVICES
FORMER UST AND SEPTIC SYSTEM SITES
5 JULY 2012

SCOPE OF WORK

Scope of this work is includes geophysical services at approximately 29 Former UST or Septic Systems sites located across Holloman AFB that have reportedly undergone past abandonment in place or excavation activities. Geophysical services are employed in an attempt to locate potential USTs, former UST excavation areas, abandoned septic tanks or excavations and associated leach field areas. Location of underground utilities near these observed features is included. Observations are marked out in field and electronically mapped with GPS data collection and GIS presentation. Survey of each site is approximately 25 by 25 to 100 by 100 feet in size.

METHODS

Methods utilized in performance of this work include: Visual Inspection, Analog Real - Time Electromagnetic Induction Conductivity Detection (EMICD), Magnetic Locating (MGL), Ground Penetrating Radar (GPR), and EM Pipe and Cable Location (EMPCL). A sub-meter WAAS GPS receiver with automatic real -time differential correction and ESRI Arcpad software is utilized to collect observation data. ESRI Arc View 10 GIS software is utilized for mapping presentation.

EMIMD ground induction methods are employed to detect both 1) broad metal mass anomalies (Rectangular Surface Projections) or conductive zones that may be indicative of potential USTs – Septic tanks, conductive metal debris, steel reinforced concrete, UST's, building hosts, piping, building demo materials, drums, sumps or other unknown burial materials; and 2) to detect relative lateral changes in conductive zones of soil or backfill materials relative to native soils. Former UST excavations and septic -leachate material may potentially have a higher conductive response or well drained leachate fill materials associated with septic systems may in some cases exhibit a relatively lower or quiet conductive response relative to surrounding higher conductive soil response. A two-way Cartesian grid pattern of five by five feet is walked within the search area (site). Observations are real time and marked on ground surface with paint and pin flagging. Observations are collected with a sub- meter GPS with automatic differential correction and plotted approximately onto web based imagery.

GPR is utilized to detect and potentially observe former UST excavation sidewalls as well as septic – leach field pit sidewall and fill areas. GPR is also utilized to compliment the EM Pipe and Cable utility survey work by potentially locating conductive as well as non-conductive utilities.

A EM Pipe and Cable Survey is conducted at each site by performing ambient passive live power and communication line sweeps, active ground induction sweeps, and active direct- connect or induction- clamp sweeps using existing conducts or pipes visibly nearby. Multiple active frequencies are utilized for best Detection. Utilities are identified where possible and marked unknown if not identified.

All observations are marked with hi-visibility orange-red marking paint. Some Ares are hi-lighted with black paint due to light soil conditions. GPR boundaries indicating potential septic tank and leach field areas are outlined with black paint. Pin flags are also utilized to mark these boundaries in soft soil and weed areas.

OBSERVATIONS

Site Description

The Project Site (Holloman AFB - Former UST and Septic Systems) is comprised of approximately 29 different environmental site locations (heir in referred to as Sites) . Each sites includes and varies in description from existing active building locations to in-active remote abandoned to former building areas where USTs or Septic systems were utilized in the past. Each Site is fairly flat with sandy to gravelly surface conditions. Some sites include native brush and weeds. Sites near active building areas include asphalt or concrete surfaces, sidewalks and planter areas. ULS field staff helped review historical documentation available of each site in the field. Where available, drawings and photographs were reviewed. When available, reported GPS coordinates from reports, of septic tank locations, were utilized by SHAW field staff to navigate to septic tank location to aid focus search area.

Generally there are no surface indications of USTS or Septic tanks, however some limited features exist at some sites and include potential vent riser pipes and asphalt patching, settling areas, and conidial – rectangular cracks in concrete. Surface indications of septic systems at some sites include potential inactive clean- outs pipes near building and nearby existing upgraded sewer man-hole systems that have been connected to the existing Base sewer collection system. Some septic system sites have open holes , surface erosion, and associated potential underground voids observed near the inactive cleanouts and suspected septic search area.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

General ambient or background EM conditions at this site are categorized as being high or noisy most likely resulting from caliche or saline soil conditions throughout the area. These conditions all result in a high ambient background EMICD response that are difficult to filter out, however, subtle to distinct lateral changes are observed potentially marking position of former UST excavations. Magnetic locator is not affected by saline conditions. GPR response in these conditions is poor to somewhat fair, however, subtle, trends in GPR observations exhibit dipping or high angle (from horizontal) refraction bands indicating potential soil side-wall trends allowing for location of approximate former excavations. The use of EMICD and GPR data in conjunction with historical information and physical observations are all utilized to mark the approximate location of potential former USTs in the field as shown on the GIS imagery maps.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

Similar response is observed near former septic systems. Most all septic tanks are reported to have been abandoned in place or partly crushed in place. Magnetic locator surveys revealed concentrated areas of metal response (metal anomalies) likely from metal plates and rebar in septic tanks in areas near former sewer clean-outs and next to reported septic tank locations where latitude and longitude data is available. EM Induction and GPR transects over these metal anomalies further corroborated these findings. EM Induction survey results near the effluent (down gradient) side of metal anomalies (potential septic tanks) resulted in observation of relatively moderately higher lateral response to zones of low to quiet lateral response zones near the septic tanks relative to the ambient response in surrounding area. GPR data across these zones exhibited very subtle side-wall trends that appear to corroborate with EMICD findings. The use of EMICD and GPR data in conjunction with historical information and physical observations of cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs in the field and as shown on the GIS imagery maps.

CONCLUSIONS and LIMITATIONS

The use of EMICD and GPR data in conjunction with historical information and physical observations of reported building location, vent riser location, boiler room location, existing and abandoned sewer cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs , Septic tanks and leach fields. Ambient soil conductivity at this site is very high and EM and GPR data observed is very subtle. Field trends are used to mark the approximate location of potential targets.

As in any type of survey or investigation to determine characteristics below grade, careful exploratory excavation or drilling may be needed to further help determine a more accurate determination of the subsurface. Use of hand tools and air knifing is also useful to help as a safety measure. Base one- call utilities, as well as, private 811 one –call should be consulted and recalled as necessary.

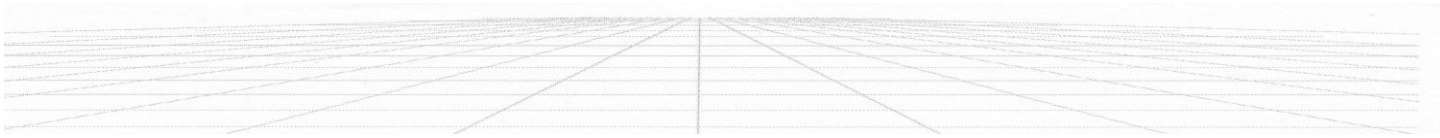
If you have any questions regarding this report please contact me at (206) 384- 2857.

Sincerely,

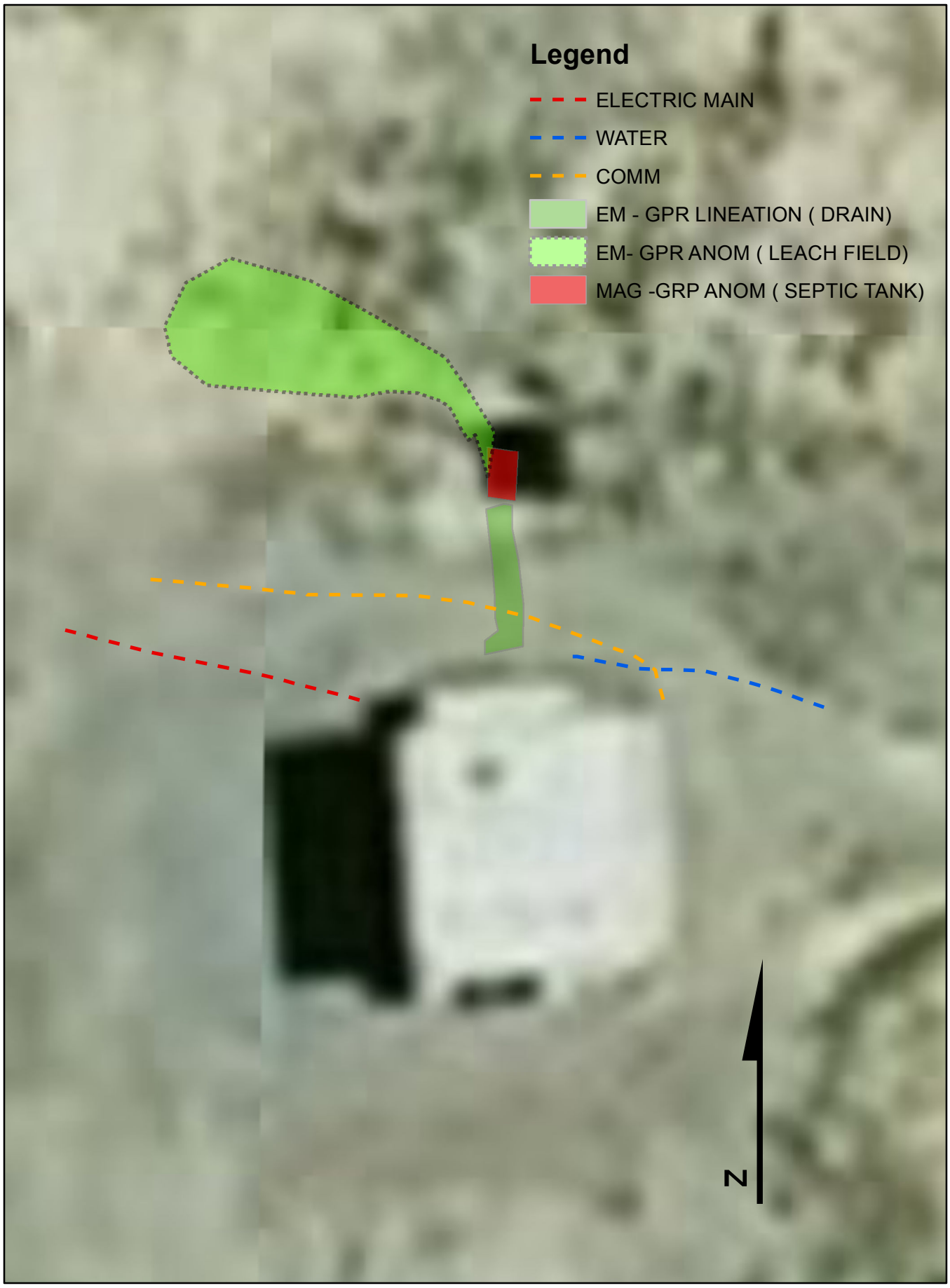
ULS SERVICES CORPORATION
Geomarkout tradename

Michael W. Benedict
Site Representative

Admin Office/Billing: PO Box 724 Pocatello, Idaho 83204
(208) 234-1441 Fax (208) 234-1507 1 800 301-4420
Seattle / Portland / SAC / Alaska / HWI – AS - GUAM Operations
1 - (866) 804- 5734 / San Diego – LA / Operations 1 - (800) 528-8206



BLDG 1196 SEPTIC SYSTEM
HOLLOMAN AFB



WGS_1984_UTM_Zone_13N
ULS SERVICES CORP
mwb 15 June 2012

0 10 20 40 60 80
Feet

Appendix D
Sample Collection Logs

Sample Collection Log

- Holloman AFB

Shaw Environmental Solutions

Manager Christopher Long

Location Code OTC535

RFA / COC Number 194106-H007

Sample Number OTC535-IS-0001-~~MMDDYY~~ 062812

Task

Sample Name OTC535-z-OTC535-IS-0001-MMDDYY-z

Collection Date 6/28/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1115

Sample Purpose ~~Unknown~~ Invest

Start Depth 3'

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) *(EB)* *(FB)*

SampleTeam RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

6/28/12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat*

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code OTC535 *RFA / COC Number* 144106-H007

Sample Number OTC535-IS-0002-~~MMDDYY~~ 062812 *Task*

Sample Name OTC535-z-OTC535-IS-0002-MMDDYY-z *Collection Date* 06/28/12

Sampling Method ~~Unknown~~ DPT *Sample Type* ~~Unknown~~ Grab *Collection Time* 1125

Sample Purpose ~~Unknown~~ Invest. *Start Depth* 10'

QC Code NORMAL ENVIRONMENTAL SAMPL *End Depth* 12

Sampling Equip Geoprobe *Sample Matrix* SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Trilium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

6/28/12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code OTC535

RFA / COC Number 144106-H007

Sample Number OTC535-IS-0003-~~MMDDYY~~ 062812

Task

Sample Name OTC535-z-OTC535-IS-0003-MMDDYY-z

Collection Date 06/28/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1740

Sample Purpose ~~Unknown~~ Invest.

Start Depth 7'

End Depth 9'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Rachel Daly 06/28/12

Reviewed By / Dat _____

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code OTC535

RFA / COC Number 144106-H007

Sample Number OTC535-IS-0004-~~MMDDYY~~ 062812

Task

Sample Name OTC535-z-OTC535-IS-0004-MMDDYY-z

Collection Date 06/28/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1150

Sample Purpose ~~Unknown~~ Invest.

Start Depth 14

End Depth 16

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06/28/12

Rachel Daly

Shaw *Logged By / Dat* *Reviewed By / Dat*

Sample Collection Log

- Holloman AFB

Shaw Environmental Solutions

Manager Christopher Long

Location Code OTC535

RFA / COC Number 144106H007

Sample Number OTC535-IS-0005-~~MMDDYY~~ 062812

Task

Sample Name OTC535-z-OTC535-IS-0005-MMDDYY-z

Collection Date 6/28/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1205

Sample Purpose ~~Unknown~~ Invest

Start Depth 3'

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Rachel Daly 06/28/12 *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code OTC535

RFA / COC Number 144106-H007

Sample Number OTC535-IS-0006-~~MMDDYY~~ 062812

Task

Sample Name OTC535-z-OTC535-IS-0006-MMDDYY-z

Collection Date 06/28/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Geoprobe

Collection Time 1215

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10'

End Depth 12'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD, LH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06/28/12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw Environmental & Infrastructure Solutions

Manager Christopher Long

Location Code OTC535 *RFA / COC Number* 144106-H007

Sample Number OTC535-IS-0007-~~MMDDYY~~ 062812 *Task*

Sample Name OTC535-z-OTC535-IS-0007-MMDDYY-z *Collection Date* 6/28/12

Sampling Method ~~Unknown~~ DPT *Sample Type* ~~Unknown~~ Grab. *Collection Time* 1355

Sample Purpose ~~Unknown~~ Invest. *Start Depth* 3

QC Code NORMAL ENVIRONMENTAL SAMPL *End Depth* 5

Sampling Equip Geoprobe *Sample Matrix* SOIL

QC Partners:

(TB) *(EB)* *(FB)* *SampleTeam* RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: p

Sketch Location:

6/28/12

Rachel Daly

Shaw *Logged By / Dat* *Reviewed By / Dat*

Sample Collection Log

- Holloman AFB

Shaw Environmental & Infrastructure Solutions

Manager Christopher Long

Location Code FIELDQC

RFA / COC Number 144106 - H007

Sample Number OTC535-IS-0008-~~MMDDYY~~062812-FD

Task

Sample Name FIELDQC-z-OTC535-IS-0008-MMDDYY-FD-z

Collection Date 06/28/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1400

Sample Purpose ~~Unknown~~ Invest.

Start Depth 3'

End Depth 5'

QC Code FIELD DUPLICATE

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06/28/12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code OTC535

RFA / COC Number 144106-H007

Sample Number OTC535-IS-0009-~~MMDDYY~~ 062812

Task

Sample Name OTC535-z-OTC535-IS-0009-MMDDYY-z

Collection Date 06/28/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1405

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 12

Sampling Equip Geoprobe.

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RO

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	)(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Rachel Daly 06/28/12 *Reviewed By / Dat* _____

Sample Collection Log

IDW Soil

Shaw Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code ~~FIELDQC~~ IDW

RFA / COC Number HO 38

Sample Number ~~OTC644-GW-0111-MMDDYY-FD~~ LDY-IDWD1-090412

Sample Name ~~FIELDQC-2-OTC644-GW-0111-MMDDYY-FD-z~~

Task

Collection Date 09/04/2012

Sampling Method ~~Unknown~~ Composite

Sample Type ~~Unknown~~ Soil

Collection Time 1330

Sample Purpose ~~Unknown~~ IDW characterization

Start Depth NA

QC Code ~~FIELD DUPLICATE~~ NA

End Depth NA

Sampling Equip Stainless steel trowel/bowl/Aluminum

Sample Matrix ~~GROUND WATER~~ IDW Soil

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam LaThom, Hodu

Containers:

	Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
1)	VOCs by SW8260C TCLP VOCs	A	Unknown	~~3~~ 1	~~40~~ 8oz	~~ML~~	~~40 ml VOA Vials~~ Glass	~~HCL~~ Cool to 4°C
	~~SW8015B : GRO~~	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
2)	SVOCs by SW8270D TCLP SVOCs / other organics	EB	Unknown	~~2~~ 1	8	x oz	1 Liter Amber Glass Glass	Cool to 4°
	~~SW8015B : GRO~~	D	Unknown	0	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~SW8015B : DRO~~	D	Unknown	2	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~PCBs by SW8082A~~ ~~TCLP~~	E	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
	~~Explosives by SW8330A~~	F	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
3)	~~Tritium by 906.0 Mod~~ RCI	C	Unknown	~~2~~ 1	1	L	~~1 Liter Amber Glass~~ Glass	~~Cool to 4°~~ Cool to 4°C
4)	Mercury by SW7470A TCLP Mercury	~~F~~ D	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~ oz	500 ml Poly Container Glass	~~HNO3~~ Cool to 4°C
5)	Metals by SW6020A TCLP Metals	~~H~~ E	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~	500 ml Poly Container Glass	~~HNO3~~ Cool to 4°C
	~~Metals by SW6010C~~	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
	~~Total CN water by 335.4~~	I	Unknown	1	500	ML	500 ml Poly Container	NaOH
	~~TDS by 160.1~~	J	Unknown	1	500	ML	500 ml Poly Container	Cool to 4°

Comments: Composite soil sample for TCLP analyses of IDW cuttings rolloff at Laydown Yard, 09/04/12

Sketch Location: Rolloff box composite sample @ Laydown Yard.

Analyses: TCLP VOCs, TCLP SVOCs, TCLP metals, TCLP Mercury, RCI

LDY = Laydown Yard

~~Shaw~~ *Logged By / Dat* Mel Hall *Reviewed By / Dat* _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code BULK WATER TANK

RFA / COC Number 144106 H070

Sample Number HAFB-IDW-BULK WATER-0001-111612

Task 144106.JM20000

Sample Name HAFB-IDW-BULK WATER-0001-111612

Collection Date 11/16/12

Sampling Method BAILER

Sample Type GRAB

Collection Time 13:00

Sample Purpose CONFIRM IDW

Start Depth N/A

QC Code

End Depth N/A

Sampling Equip DISPOSABLE BAILER

Sample Matrix **WATER**

QC Partners:

(TB) (EB) (FB)

SampleTeam JH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	B	Unknown	4	8	8OZ	Amber Glass	Cool to 4°
SW8015 : ORO	C	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015 : DRO	C	Unknown	1	1	L	1 Liter Amber Glass	H2SO4
Metals by SW6020A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
METALS by SW6020A	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Mercury by SW7470A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Metals by SW6010C	D	Unknown	1	500	ML	500 ml Poly Container	HNO3
	E		1	500	ML	500 ml Poly Cont	Cool to 4°
SW8015 : GRO	F	Unknown	3	40	ML	40 ml VOA Vials	HCL

Comments: SAMPLE COLLECTED FROM BULK WATER STORAGE TANK AFTER ALL WATER DRUMS WERE CONSOLIDATED. SENT BOTH A PRESERVED AND UNPRESERVED 500ML POLY FOR METALS. SPOKE WITH LAB AND THEY SAID TO SEND UNPRESERVED, BUT I THINK MAYBE THEY MADE A MISTAKE.

Sketch Location:

Shaw Logged By / Dat

Reviewed By / Dat

Appendix E
Boring Logs

Boring ID: OT-C535-Station 1

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1196

Date Completed: 6/28/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4105.82
Y Coordinate: 687047.4644
X Coordinate: 1686384.1096

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); light brown to white; dry; soft; trace coarse gravel.		Hand auger from 0 - 5 ft. Began drilling on 6/28/12.
5		OTC535-IS-0001-062812	NR		Same as above (0 ft); white.	ML	
10					Same as above (0 ft); mottled red and white; clayey; trace medium to coarse sand; trace fine gravel. Same as above (0 ft); brown; damp.		
15		OTC535-IS-0002-062812	NR		Lean CLAY (CL); mottled red and white; dry; soft. Note: trace gypsum crystals.	CL	Total depth = 15 ft. Reached total depth on 6/28/12. **Water table not encountered at this location
20			NR				
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:47 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C535-Station 2

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1196

Date Completed: 6/28/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4105.63
Y Coordinate: 687071.3545
X Coordinate: 1686372.7809

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); light brown; dry; soft.		Hand auger from 0 - 5 ft. Began drilling on 6/28/12.
					SILT with Sand (ML); reddish brown; dry; soft; coarse sand; trace fine gravel.		
5			NR		Same as above (0 ft); light brown to white.	ML	
		OTC535-IS-0003-062812					
10			NR		Same as above (0 ft); white.		
					Lean CLAY (CL); mottled red and white; dry; soft to firm. Note: gypsum crystals.		
15		OTC535-IS-0004-062812	NR		Same as above (12.5 ft); medium firm.	CL	
20			NR				Total depth = 20 ft. Reached total depth on 6/28/12.
							**Water table not encountered at this location.
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:47 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C535-Station 3

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1196

Date Completed: 6/28/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4105.85
Y Coordinate: 687083.6449
X Coordinate: 1686377.8964

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); light brown; dry; soft.	ML	Hand auger from 0 - 5 ft. Began drilling on 6/28/12.
5		OTC535-IS-0005-062812	NR		Same as above (0 ft); light brown to white.		
10		OTC535-IS-0006-062812	NR		Same as above (0 ft); white.		
15			NR		Lean CLAY (CL); mottled red and white; dry; soft. Note: gypsum crystals.	CL	Total depth = 15 ft. Reached total depth on 6/28/12. **Water table not encountered at this location.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:47 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C535-Station 4

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1196

Date Completed: 6/28/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4105.12
Y Coordinate: 687104.3989
X Coordinate: 1686299.6821

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); light brown; dry; soft.	ML	Hand auger from 0 - 5 ft. Began drilling on 6/28/12.
5		OTC535-IS-0007-062812 and OTC535-IS-0008-062812	NR		Lean CLAY (CL); mottled red and white; dry; medium firm to firm. Note: gypsum crystals.	CL	
10		OTC535-IS-0009-062812	NR		Same as above (5 ft).		
15			NR		SILT (ML); white; dry; soft. Note: gypsum crystals.	ML	
20			NR		Lean CLAY (CL); red; dry; firm. Note: gypsum crystals.	CL	
25			NR		Same as above (0 ft); light brown to white. Same as above (0 ft); white.	ML	
30					Poorly graded SAND (SP); light brown; damp to moist; medium dense; very fine sand; trace silt.	SP / CL	

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:47 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C535-Station 4

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1196

Date Completed: 6/28/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4105.12
Y Coordinate: 687104.3989
X Coordinate: 1686299.6821

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
30			NR		Lean CLAY (CL); red; dry to damp; medium firm. Note: gypsum crystals. Same as above (30 ft); medium firm to firm.	CL	
35			NR		Poorly graded SAND (SP); red; moist; medium dense; very fine sand; trace clay. Lean CLAY (CL); red to mottled red and white; dry to damp; firm.	SP CL	
40			NR				Total depth = 40 ft. Reached total depth on 6/28/12. **Water table not encountered. No well constructed at this location.
45							
50							
55							
60							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:47 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Appendix F
Site Survey Data

Revised Rpt
09/11/2013
(re: TU/US-C513)
p. 7 of 10

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	682987.8550	1687022.9920	4098.16	BASE	682789.9107	1686534.0572
2	678390.1010	1678735.5020	4064.77	CP-52-P-19	678193.4892	1678248.9690
3	683252.1480	1680789.5360	4078.80	CP-55-JACK	683054.1271	1680302.4077
4	681667.1260	1694574.3780	4140.57	CP-56-AIR	681469.5645	1694083.2546
5	669733.4460	1682234.2110	4048.59	HAFB-07-07	669539.3431	1681746.6640
6	669695.2030	1718768.4150	4157.95	ALAMOAIR	669501.1112	1718270.2797
7	674362.7100	1713591.4300	4160.17	F248	674167.2655	1713094.7951
8	676850.6600	1718114.2590	4193.99	E-248	676654.4944	1717616.3133
50	691964.7620	1687201.2770	4140.90	MALONE	691764.2160	1686712.2905
51	662077.1700	1670356.4250	4077.10	BATE	661885.2861	1669872.3205
52	678390.1080	1678735.5040	4066.10	P 19	678193.4962	1678248.9710
53	644127.0780	1700529.8000	4039.00	MONT	643940.3964	1700036.9506
54	676850.6920	1718114.2670	4193.99	E 248	676654.5264	1717616.3213
55	683252.1970	1680789.5390	4080.20	JACK	683054.1761	1680302.4107
56	681667.0380	1694574.3640	4141.20	AIR	681469.4765	1694083.2406
82	678193.4999	1678248.9801	4064.92	P	677996.9451	1677762.5882
84	676654.5300	1717616.3305	4192.77	E	676458.4212	1717118.5291
85	683054.1798	1680302.4198	4079.02	JACK	682856.2163	1679815.4327
86	681469.4802	1694083.2497	4140.00	AIR	681271.9760	1693592.2686
100	685975.0760	1686614.9100	4101.87	OT-C534-PVC	685776.2660	1686126.0934
101	685975.4260	1686614.8310	4102.28	OT-C534-CASING	685776.6159	1686126.0145
102	685952.4860	1686626.9650	4101.89	OT-C534-W2-PVC	685753.6825	1686138.1449
103	685952.6870	1686626.9300	4102.33	OT-C534-W2-CASING	685753.8834	1686138.1099
104	685939.9110	1686581.7340	4101.89	OT-C534-W1-CASING	685741.1111	1686092.9270
105	685939.6450	1686581.7790	4101.57	OT-C534-W1-PVC	685740.8452	1686092.9720
106	685924.3640	1686619.9800	4101.81	OT-C534-W4-PVC	685725.5687	1686131.1620
107	685924.6590	1686619.8790	4102.23	OT-C534-W4-CASING	685725.8636	1686131.0610
108	685934.1180	1686578.3320	4101.72	OT-C534-LEACH-NG	685735.3198	1686089.5260
109	685935.7830	1686600.7340	4101.88	OT-C534-LEACH-NG	685736.9843	1686111.9215
110	685938.2680	1686607.0980	4101.88	OT-C534-LEACH-NG	685739.4686	1686118.2837
111	685951.4240	1686604.4600	4101.90	OT-C534-LEACH-NG	685752.6208	1686115.6465
112	685953.8200	1686601.1380	4101.88	OT-C534-LEACH-NG	685755.0161	1686112.3254
113	685953.2500	1686596.8650	4101.88	OT-C534-LEACH-NG	685754.4463	1686108.0537
114	685946.2830	1686578.3790	4101.81	OT-C534-LEACH-NG	685747.4813	1686089.5730
115	685945.3070	1686576.3400	4101.88	OT-C534-LEACH-NG	685746.5056	1686087.5346
116	685940.6850	1686575.6580	4101.79	OT-C534-LEACH-NG	685741.8849	1686086.8528
117	685952.3510	1686614.8200	4102.03	OT-C534-LEACH-NG	685753.5475	1686126.0035
118	685953.0040	1686623.0300	4102.13	OT-C534-LEACH-NG	685754.2004	1686134.2111
119	685945.6920	1686623.1960	4102.03	OT-C534-LEACH-NG	685746.8905	1686134.3770
120	685944.8810	1686615.5440	4101.97	OT-C534-LEACH-NG	685746.0797	1686126.7272
121	685948.0570	1686615.1700	4101.97	OT-C534-FLINE-NG	685749.2548	1686126.3534
122	685947.7680	1686606.3420	4101.81	OT-C534-FLINE-NG	685748.9659	1686117.5279
123	685953.2050	1686618.0690	4102.08	OT-C534-ENFLU-NG	685754.4013	1686129.2515
124	685968.5800	1686611.5870	4102.06	OT-C534-ENFLU-NG	685769.7718	1686122.7714
125	686021.5760	1686604.3860	4102.49	OT-C534-ENFLU-NG	685822.7525	1686115.5725
126	686051.0660	1686600.5520	4102.82	OT-C534-ENFLU-NG	685852.2339	1686111.7396
127	682943.9250	1686529.5770	4094.74	OT-C536-STATION1-NG	682745.9934	1686040.7852
128	682925.1900	1686534.9010	4094.63	OT-C536-STATION2-NG	682727.2639	1686046.1076
129	682914.0740	1686530.8350	4094.17	OT-C536-STATION3-NG	682716.1511	1686042.0428
130	682900.2750	1686534.1950	4094.40	MW-OT-C5361-CASING	682702.3561	1686045.4018
131	682900.0410	1686534.2560	4094.03	MW-OT-C5361-PVC	682702.1222	1686045.4628
132	682892.0960	1686514.3610	4094.08	OT-C536-LEACH-NG	682694.1795	1686025.5736
133	682905.9860	1686504.4840	4093.98	OT-C536-LEACH-NG	682708.0654	1686015.6994
134	682914.9460	1686505.2970	4094.10	OT-C536-LEACH-NG	682717.0228	1686016.5122
135	682919.4610	1686521.1490	4094.40	OT-C536-LEACH-NG	682721.5365	1686032.3596
136	682921.1340	1686534.7310	4094.42	OT-C536-LEACH-NG	682723.2091	1686045.9377
137	682919.5910	1686545.0230	4094.72	OT-C536-LEACH-NG	682721.6665	1686056.2267
138	682912.1700	1686551.2270	4094.60	OT-C536-LEACH-NG	682714.2477	1686062.4289
139	682897.7180	1686551.9240	4094.16	OT-C536-LEACH-NG	682699.7998	1686063.1257
140	682892.5110	1686549.8820	4094.18	OT-C536-LEACH-NG	682694.5943	1686061.0843
141	682922.3680	1686533.4440	4094.42	OT-C536-TANKPIT-NG	682724.4427	1686044.6510
142	682920.9800	1686525.5880	4094.39	OT-C536-TANKPIT-NG	682723.0551	1686036.7973
143	682928.0220	1686524.4280	4094.63	OT-C536-TANKPIT-NG	682730.0951	1686035.6377
144	682929.2370	1686532.7090	4094.62	OT-C536-TANKPIT-NG	682731.3097	1686043.9163
145	682949.7020	1686528.9800	4094.75	OT-C536-ENFLU-NG	682751.7688	1686040.1883
146	682921.2900	1686528.9090	4094.41	OT-C536-ENFLU-NG	682723.3650	1686040.1174
147	682916.2970	1686530.1310	4094.27	OT-C536-ENFLU-NG	682718.3735	1686041.3390
148	682877.6850	1686739.3620	4095.03	OT-C533-MW-CASING	682679.7726	1686250.5094
149	682877.4490	1686739.4350	4094.68	OT-C533-MW-PVC	682679.5367	1686250.5823
150	682884.2550	1686735.8390	4094.76	OT-C533-LEACH-NG	682686.3407	1686246.9874
151	682877.4700	1686734.1690	4094.84	OT-C533-LEACH-NG	682679.5577	1686245.3179

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
152	682871.6400	1686736.6530	4094.83	OT-C533-LEACH-NG	682673.7294	1686247.8011
153	682869.4200	1686738.9370	4094.89	OT-C533-LEACH-NG	682671.5100	1686250.0845
154	682868.8760	1686741.4810	4094.99	OT-C533-LEACH-NG	682670.9662	1686252.6277
155	682867.8710	1686756.1100	4095.03	OT-C533-LEACH-NG	682669.9615	1686267.2525
156	682857.6950	1686766.0680	4095.35	OT-C533-LEACH-NG	682659.7884	1686277.2076
157	682855.8760	1686772.9280	4095.39	OT-C533-LEACH-NG	682657.9700	1686284.0656
158	682855.6590	1686783.4130	4095.46	OT-C533-LEACH-NG	682657.7530	1686294.5476
159	682855.5230	1686790.0690	4095.47	OT-C533-LEACH-NG	682657.6171	1686301.2017
160	682857.2270	1686794.8730	4095.42	OT-C533-LEACH-NG	682659.3206	1686306.0043
161	682858.6900	1686813.7880	4095.55	OT-C533-LEACH-NG	682660.7832	1686324.9138
162	682867.9360	1686816.7350	4095.32	OT-C533-LEACH-NG	682670.0265	1686327.8599
163	682880.0660	1686814.6740	4095.00	OT-C533-LEACH-NG	682682.1530	1686325.7995
164	682891.9700	1686818.7840	4094.82	OT-C533-LEACH-NG	682694.0535	1686329.9083
165	682901.1340	1686806.7570	4094.86	OT-C533-LEACH-NG	682703.2148	1686317.8848
166	682889.7110	1686785.0140	4094.98	OT-C533-LEACH-NG	682691.7952	1686296.1481
167	682889.3190	1686757.8750	4094.96	OT-C533-LEACH-NG	682691.4033	1686269.0170
168	682886.6550	1686745.7080	4094.83	OT-C533-LEACH-NG	682688.7400	1686256.8535
169	682895.8900	1686814.7130	4095.19	OT-C533-FFLUEN-NG	682697.9724	1686325.8385
170	682901.8890	1686814.2530	4095.86	OT-C533-FFLUEN-TPAD	682703.9696	1686325.3787
171	682901.5970	1686811.8220	4095.84	OT-C533-SEPTIC-TCONC	682703.6777	1686322.9484
172	682911.5820	1686810.3750	4095.77	OT-C533-SEPTIC-TCONC	682713.6598	1686321.5018
173	682912.4280	1686815.4170	4095.77	OT-C533-SEPTIC-TCONC	682714.5056	1686326.5423
174	682902.3730	1686816.8390	4095.84	OT-C533-SEPTIC-TCONC	682704.4535	1686327.9639
175	682912.0910	1686812.7560	4095.77	OT-C533-EFLUEN-TCONC	682714.1687	1686323.8821
176	682923.3600	1686810.9450	4095.29	OT-C533-EFLUEN-NG	682725.4344	1686322.0716
177	682942.2940	1686810.3140	4095.49	OT-C533-EFLUEN-NG	682744.3629	1686321.4408
178	682937.5080	1686805.9000	4095.30	OT-C533-STATION1-NG	682739.5783	1686318.0278
179	682906.2780	1686808.8380	4094.86	OT-C533-STATION2-NG	682708.3574	1686319.9652
180	682895.2770	1686813.2080	4094.98	OT-C533-STATION3-NG	682697.3595	1686324.3340
181	700191.9570	1695605.3730	4181.72	OT-C540-STATION1-ASP	699989.0266	1695113.9508
182	700173.9260	1695611.2520	4181.82	OT-C540-STATION2-NG	699971.0008	1695119.8281
183	700168.8930	1695604.5390	4181.39	OT-C540-STATION3-NG	699965.9693	1695113.1170
184	700151.2700	1695598.6630	4180.49	OT-C540-STATION4-NG	699948.3514	1695107.2427
185	700158.9630	1695593.9090	4180.86	OT-C540-LEACH-NG	699956.0422	1695102.4901
186	700150.2560	1695603.0840	4180.78	OT-C540-LEACH-NG	699947.3377	1695111.6625
187	700152.8330	1695609.6400	4180.81	OT-C540-LEACH-NG	699949.9139	1695118.2166
188	700155.1660	1695611.7200	4180.89	OT-C540-LEACH-NG	699952.2463	1695120.2960
189	700161.1020	1695611.3470	4181.11	OT-C540-LEACH-NG	699958.1805	1695119.9231
190	700163.7200	1695601.1600	4181.06	OT-C540-LEACH-NG	699960.7978	1695109.7390
191	700161.5790	1695596.1920	4181.05	OT-C540-LEACH-NG	699958.6574	1695104.7725
192	700165.7400	1695603.7570	4181.48	OT-C540-FFLUEN-NG	699962.8172	1695112.3353
193	700170.8520	1695608.8530	4181.93	OT-C540-FFLUEN-NG	699967.9277	1695117.4298
194	700170.7290	1695606.7600	4182.01	OT-C540-SEPTIC-NG	699967.8048	1695115.3374
195	700176.8760	1695605.4490	4181.91	OT-C540-SEPTIC-NG	699973.9500	1695114.0268
196	700177.5910	1695612.4300	4181.92	OT-C540-SEPTIC-NG	699974.6648	1695121.0058
197	700172.1930	1695613.9030	4182.05	OT-C540-SEPTIC-NG	699969.2683	1695122.4783
198	700177.7030	1695608.9790	4181.69	OT-C540-EFLUEN-NG	699974.7767	1695117.5558
199	700205.8220	1695608.1850	4181.85	OT-C540-EFLUEN-ASPH	700002.8876	1695116.7620
200	700246.4300	1695613.4690	4182.95	OT-C540-EFLUEN-ASPH	700043.4838	1695122.0445
201	700238.4930	1695614.0360	4182.51	OT-C540-BLDGCOR	700035.5491	1695122.6113
202	700228.4390	1695608.1640	4182.55	OT-C540-BLDGCOR	700025.4980	1695116.7410
203	700227.0510	1695568.0300	4182.87	OT-C540-BLDGCOR	700024.1104	1695076.6186
204	700236.9380	1695557.6950	4183.02	OT-C540-BLDGCOR	700033.9946	1695066.2866
205	688305.7410	1690609.5510	4126.46	TU\US-C507-STATION1-	688106.2555	1690119.5767
206	688309.7220	1690614.0760	4126.51	TU\US-C507-STATION2-	688110.2353	1690124.1004
207	688306.7130	1690619.4150	4126.45	TU\US-C507-STATION3-	688107.2272	1690129.4378
208	688313.7000	1690621.8280	4126.37	TU\US-C507-STATION4-	688114.2122	1690131.8501
209	688313.7950	1690607.6410	4126.36	TU\US-C507-STATION5-	688114.3071	1690117.6673
210	688304.0140	1690620.9730	4126.47	TU\US-C507-USTPIT-AS	688104.5290	1690130.9954
211	688304.3040	1690607.3010	4126.54	TU\US-C507-USTPIT-AS	688104.8189	1690117.3274
212	688317.4320	1690607.1780	4126.54	TU\US-C507-USTPIT-AS	688117.9431	1690117.2044
213	688317.6000	1690622.2860	4126.57	TU\US-C507-USTPIT-AS	688118.1110	1690132.3080
214	688320.7590	1690623.9670	4127.18	TU\US-C507-BLDGCOR	688121.2691	1690133.9885
215	688330.7630	1690627.7570	4125.65	TU\US-C507-BLDGCOR	688131.2702	1690137.7774
216	688318.5520	1690598.7120	4126.71	TU\US-C507-BLDGCOR	688119.0628	1690108.7408
217	688306.5580	1690598.9520	4126.69	TU\US-C507-BLDGCOR	688107.0722	1690108.9808
218	688287.5740	1690592.3200	4126.83	TU\US-C507-EXMW1	688088.0937	1690102.3507
219	688287.4600	1690625.9270	4126.36	TU\US-C507-EXMW2	688087.9798	1690135.9480
220	689216.8690	1680453.8850	4087.76	TU\US-C501-STATION4-	689017.1194	1679966.8540
221	689203.4000	1680450.4300	4087.80	TU\US-C501-STATION1-	689003.6543	1679963.4000
222	689227.9170	1680449.2880	4087.78	TU\US-C501-STATION2-	689028.1642	1679962.2584

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
223	689201.2820	1680437.6020	4087.96	TU\US-C501-STATION3-	689001.5369	1679950.5757
224	689204.0090	1680426.7550	4087.80	TU\US-C501-STATION5-	689004.2631	1679939.7319
225	689200.5240	1680440.6650	4087.95	TU\US-C501-BLDGCOR-N	689000.7792	1679953.6379
226	689191.1430	1680432.8740	4088.07	TU\US-C501-BLDGCOR-N	688991.4009	1679945.8491
227	689202.0960	1680449.8730	4087.79	TU\US-C501-TANKPIT-N	689002.3507	1679962.8432
228	689201.5860	1680440.8210	4087.99	TU\US-C501-TANKPIT-N	689001.8408	1679953.7938
229	689191.7450	1680432.9310	4088.07	TU\US-C501-TANKPIT-N	688992.0027	1679945.9061
230	689195.4710	1680423.1750	4087.88	TU\US-C501-TANKPIT-N	688995.7276	1679936.1529
231	689207.1960	1680422.4490	4087.92	TU\US-C501-TANKPIT-N	689007.4492	1679935.4271
232	689229.2900	1680431.3210	4087.77	TU\US-C501-TANKPIT-N	689029.5368	1679944.2966
233	689231.6150	1680444.1310	4087.67	TU\US-C501-TANKPIT-N	689031.8611	1679957.1029
234	689227.5450	1680454.7320	4087.83	TU\US-C501-TANKPIT-N	689027.7923	1679967.7008
235	689218.0540	1680463.3780	4088.03	TU\US-C501-TANKPIT-N	689018.3041	1679976.3443
236	689209.0460	1680458.6260	4087.92	TU\US-C501-TANKPIT-N	689009.2987	1679971.5937
237	689237.1630	1680445.1670	4087.64	TU\US-C501-COMMLINE-	689037.4075	1679958.1386
238	689219.6050	1680436.9770	4088.00	TU\US-C501-COMMLINE-	689019.8546	1679949.9509
239	689199.7540	1680431.6770	4088.06	TU\US-C501-COMMLINE-	689000.0094	1679944.6525
240	689181.3550	1680425.0490	4088.20	TU\US-C501-COMMLINE-	688981.6157	1679938.0264
241	689162.6180	1680417.3900	4088.35	TU\US-C501-COMMLINE-	688962.8841	1679930.3696
242	689161.5970	1680417.5650	4088.56	TU\US-C501-COMMVAULT	688961.8634	1679930.5446
243	689157.8580	1680421.3400	4088.11	TU\US-C501-COMMVAULT	688958.1255	1679934.3185
244	689150.8680	1680414.5760	4088.10	TU\US-C501-COMMVAULT	688951.1375	1679927.5564
245	689154.6050	1680410.8830	4088.46	TU\US-C501-COMMVAULT	688954.8735	1679923.8645
246	687246.6430	1686873.0010	4105.82	OT-C535-STATION1-NG	687047.4644	1686384.1096
247	687270.5400	1686861.6690	4105.63	OT-C535-STATION2-NG	687071.3545	1686372.7809
248	687282.8340	1686866.7860	4105.85	OT-C535-STATION3-NG	687083.6449	1686377.8964
249	687303.5940	1686788.5490	4105.12	OT-C535-STATION4-NG	687104.3989	1686299.6821
250	687291.9640	1686793.7970	4105.27	OT-C535-LEACH-NG	687092.7723	1686304.9286
251	687304.7930	1686782.8770	4105.17	OT-C535-LEACH-NG	687105.5976	1686294.0117
252	687323.6740	1686798.1880	4105.34	OT-C535-LEACH-NG	687124.4731	1686309.3183
253	687319.7080	1686817.5380	4105.82	OT-C535-LEACH-NG	687120.5083	1686328.6627
254	687307.4400	1686838.9610	4105.76	OT-C535-LEACH-NG	687108.2438	1686350.0795
255	687297.0830	1686856.5380	4106.04	OT-C535-LEACH-NG	687097.8898	1686367.6514
256	687290.0540	1686837.9200	4105.59	OT-C535-LEACH-NG	687090.8628	1686349.0388
257	687291.3760	1686806.0200	4105.33	OT-C535-LEACH-NG	687092.1845	1686317.1480
258	687284.5890	1686864.5150	4106.11	OT-C535-FFLUEN-NG	687085.3994	1686375.6261
259	687276.8290	1686868.4490	4106.19	OT-C535-FFLUEN-NG	687077.6417	1686379.5589
260	687276.0820	1686870.8490	4106.28	OT-C535-SEPTIC-NG	687076.8949	1686381.9583
261	687263.3720	1686869.7190	4105.87	OT-C535-SEPTIC-NG	687064.1886	1686380.8286
262	687263.7200	1686863.5770	4105.95	OT-C535-SEPTIC-NG	687064.5365	1686374.6884
263	687276.4840	1686862.8870	4106.07	OT-C535-SEPTIC-NG	687077.2968	1686373.9986
264	687263.5270	1686868.1150	4105.92	OT-C535-EFLUEN-NG	687064.3435	1686379.2250
265	687228.9570	1686874.1570	4105.71	OT-C535-EFLUEN-NG	687029.7836	1686385.2653
266	687235.2230	1686881.4610	4106.05	OT-C535-BLDGCOR-NG	687036.0477	1686392.5672
267	687225.9150	1686892.3360	4105.90	OT-C535-BLDGCOR-NG	687026.7424	1686403.4390
268	687232.0250	1686844.5370	4105.92	OT-C535-BLDGCOR-NG	687032.8507	1686355.6539
269	687221.4890	1686835.3400	4105.63	OT-C535-BLDGCOR-NG	687022.3177	1686346.4595
270	677637.2460	1692755.6660	4110.24	TU/US-C505-MW1-CASIN	677440.8524	1692265.0697
271	677636.9990	1692755.6590	4109.84	TU/US-C505-MW1-PVC	677440.6055	1692265.0627
272	677634.4160	1692722.3930	4110.42	TU/US-C505-WELLATEMP	677438.0233	1692231.8064
273	677659.4620	1692742.2400	4110.34	TU/US-C505-WELLATEMP	677463.0620	1692251.6476
274	677701.9500	1692799.3200	4110.17	TU/US-C505-USTPIT-NG	677505.5377	1692308.7111
275	677701.3830	1692789.3010	4110.35	TU/US-C505-USTPIT-NG	677504.9708	1692298.6950
276	677711.5570	1692789.5280	4110.64	TU/US-C505-USTPIT-NG	677515.1419	1692298.9219
277	677710.8940	1692799.1130	4110.24	TU/US-C505-USTPIT-NG	677514.4791	1692308.5041
278	677707.4060	1692790.0820	4110.35	TU/US-C505-STATION1-	677510.9921	1692299.4757
279	677702.3100	1692795.0710	4110.20	TU/US-C505-STATION2-	677505.8976	1692304.4633
280	677705.6610	1692797.9500	4110.13	TU/US-C505-STATION3-	677509.2476	1692307.3415
281	677710.4770	1692793.8740	4110.09	TU/US-C505-STATION4-	677514.0622	1692303.2666
282	677706.4200	1692793.8350	4110.12	TU/US-C505-STATION5-	677510.0064	1692303.2276
283	677694.5060	1692779.7220	4110.88	TU/US-C505-BLDGCOR-N	677498.0958	1692289.1187
284	677704.1940	1692790.4680	4110.28	TU/US-C505-BLDGCOR-N	677507.7810	1692299.8616
285	677754.5670	1692783.0890	4110.79	TU/US-C505-BLDGCOR-N	677558.1394	1692292.4848
286	677743.8570	1692795.1680	4110.70	TU/US-C505-BLDGCOR-N	677547.4325	1692304.5603
287	686300.2320	1672933.0350	4060.98	OT-C542-MW-CASING-	686101.3277	1672448.1837
288	686300.2350	1672933.0550	4060.98	OT-C542-MW-PVC	686101.3307	1672448.2037
289	686274.4020	1672914.6520	4061.01	OT-C542-LEACH-NG	686075.5052	1672429.8061
290	686289.6710	1672938.5250	4060.76	OT-C542-LEACH-NG	686090.7698	1672453.6721
291	686294.6900	1672941.1720	4060.83	OT-C542-LEACH-NG	686095.7873	1672456.3184
292	686301.6970	1672938.9490	4060.85	OT-C542-LEACH-NG	686102.7923	1672454.0960
293	686305.7170	1672936.2850	4060.87	OT-C542-LEACH-NG	686106.8111	1672451.4328

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
294	686308.0670	1672931.0550	4060.89	OT-C542-LEACH-NG	686109.1604	1672446.2043
295	686304.8000	1672917.9090	4060.82	OT-C542-LEACH-NG	686105.8944	1672433.0621
296	686292.3740	1672901.2590	4060.90	OT-C542-LEACH-NG	686093.4720	1672416.4169
297	686283.4190	1672906.7050	4060.97	OT-C542-FFLUEN-NG	686084.5196	1672421.8614
298	686280.3770	1672902.6520	4060.94	OT-C542-FFLUEN-NG	686081.4785	1672417.8095
299	686276.9070	1672904.6420	4060.95	OT-C542-SEPTIC-NG	686078.0095	1672419.7990
300	686271.2980	1672896.9550	4060.80	OT-C542-SEPTIC-NG	686072.4021	1672412.1142
301	686281.9530	1672889.9350	4060.83	OT-C542-SEPTIC-NG	686083.0540	1672405.0962
302	686287.0950	1672896.6800	4060.88	OT-C542-SEPTIC-NG	686088.1945	1672411.8393
303	686285.7900	1672894.7150	4060.83	OT-C542-EFLUEN-NG	686086.8899	1672409.8748
304	686299.2270	1672887.1560	4060.87	OT-C542-EFLUEN-NG	686100.3230	1672402.3180
305	686310.9860	1672881.5880	4061.18	OT-C542-EFLUEN-NG	686112.0786	1672396.7516
306	686294.2970	1672858.0380	4060.90	OT-C542-BLDGCOR-NG	686095.3944	1672373.2085
307	686295.8820	1672844.1310	4061.28	OT-C542-BLDGCOR-NG	686096.9790	1672359.3055
308	686345.1390	1672922.4560	4060.89	OT-C542-BLDGCOR-NG	686146.2217	1672437.6078
309	686358.9780	1672924.0940	4061.42	OT-C542-BLDGCOR-NG	686160.0567	1672439.2453
310	686291.8860	1672885.1500	4060.65	OT-C542-STATION1-NG	686092.9841	1672400.3126
311	686275.2730	1672891.5340	4060.63	OT-C542-STATION2-NG	686076.3760	1672406.6948
312	686281.5390	1672904.6340	4060.73	OT-C542-STATION2-NG	686082.6401	1672419.7910
313	685750.1690	1671530.2910	4055.60	OT-C543-STATION2-NG	685551.4241	1671045.8463
314	685734.0730	1671548.8090	4055.84	OT-C543-STATION2	685535.3328	1671064.3589
315	685727.7350	1671514.3350	4055.33	OT-C543-STATION3	685528.9966	1671029.8949
316	685749.4390	1671546.6740	4055.91	OT-C543-EXSEPTIC	685550.6944	1671062.2245
317	685732.6430	1671545.5190	4055.74	OT-C543-EXSEPTIC	685533.9032	1671061.0699
318	685741.2600	1671557.0720	4056.32	OT-C543-EXSEPTIC	685542.5177	1671072.6195
319	685738.1510	1671537.7290	4055.62	OT-C543-EXSEPTIC	685539.4096	1671053.2821
320	685734.3520	1671541.2760	4055.65	OT-C543-FFLUEN	685535.6117	1671056.8281
321	685716.0920	1671515.5090	4055.04	OT-C543-FFLUEN	685517.3570	1671031.0686
322	685708.2650	1671520.5800	4055.23	OT-C543-LEACH	685509.5323	1671036.1381
323	685688.3040	1671512.0560	4055.52	OT-C543-LEACH	685489.5771	1671027.6166
324	685669.5610	1671502.3840	4055.36	OT-C543-LEACH	685470.8395	1671017.9474
325	685659.9210	1671495.2130	4055.04	OT-C543-LEACH	685461.2023	1671010.7784
326	685670.4020	1671495.5660	4055.43	OT-C543-MW-CASING	685471.6803	1671011.1313
327	685670.1370	1671495.6580	4055.13	OT-C543-MW-PVC	685471.4153	1671011.2233
328	685682.2550	1671485.7460	4055.16	OT-C543-LEACH	685483.5298	1671001.3142
329	685699.8070	1671491.2750	4054.76	OT-C543-LEACH	685501.0767	1671006.8416
330	685710.4840	1671499.0550	4055.06	OT-C543-LEACH	685511.7506	1671014.6193
331	685721.5030	1671508.4730	4055.40	OT-C543-LEACH	685522.7664	1671024.0346
332	685794.8190	1671498.3320	4056.84	OT-C543-EFLUEN	685596.0612	1671013.8965
333	685809.3600	1671495.0820	4059.27	OT-C543-BLDGCOR	685610.5980	1671010.6475
334	685776.9050	1671465.9090	4060.02	OT-C543-BLDGCOR	685578.1524	1670981.4829
335	685785.4230	1671455.8900	4060.26	OT-C543-BLDGCOR	685586.6679	1670971.4668
336	685744.8400	1671542.1950	4055.76	OT-C543-EFLUEN	685546.0967	1671057.7468
337	685303.6520	1671072.3550	4048.79	OT-C544-MW-CASING	685105.0365	1670588.0430
338	685303.3550	1671072.2840	4048.52	OT-C544-MW-PVC	685104.7396	1670587.9720
339	685349.4970	1671083.9730	4052.43	OT-C544-STATION1	685150.8683	1670599.6576
340	685342.4960	1671086.5980	4051.55	OT-C544-STATION1	685143.8693	1670602.2819
341	685336.0530	1671085.0120	4050.99	OT-C544-STATION1	685137.4282	1670600.6963
342	685336.7000	1671089.5480	4051.15	OT-C544-SEPTIC	685138.0750	1670605.2310
343	685338.4520	1671075.7050	4051.30	OT-C544-SEPTIC	685139.8265	1670591.3920
344	685347.8050	1671077.3720	4052.23	OT-C544-SEPTIC	685149.1768	1670593.0585
345	685345.6600	1671089.9410	4052.38	OT-C544-SEPTIC	685147.0324	1670605.6239
346	685356.1020	1671079.9660	4041.22	OT-C544-EFLUEN	685157.4713	1670595.6518
347	685347.2700	1671081.8770	4052.36	OT-C544-EFLUEN	685148.6419	1670597.5622
348	685337.4940	1671082.4320	4051.31	OT-C544-FFLUEN	685138.8687	1670598.1171
349	685335.1290	1671082.2690	4051.14	OT-C544-FFLUEN	685136.5044	1670597.9541
350	685336.2280	1671075.8560	4050.85	OT-C544-LEACH	685137.6031	1670591.5430
351	685323.3310	1671071.0830	4049.91	OT-C544-LEACH	685124.7098	1670586.7714
352	685297.8990	1671068.1360	4048.16	OT-C544-LEACH	685099.2852	1670583.8252
353	685296.9990	1671078.2660	4047.94	OT-C544-LEACH	685098.3855	1670593.9523
354	685317.0900	1671090.9580	4049.62	OT-C544-LEACH	685118.4707	1670606.6406
355	685334.6940	1671090.0750	4050.81	OT-C544-LEACH	685136.0696	1670605.7579
356	685360.4020	1671127.4140	4053.89	OT-C544-BLDGCOR	685161.7701	1670643.0860
357	685349.8450	1671114.5020	4052.32	OT-C544-BLDGCOR	685151.2162	1670630.1778
358	685360.3480	1671033.1240	4052.96	OT-C544-BLDGCOR	685161.7161	1670548.8234
359	685371.1230	1671022.2010	4053.70	OT-C544-BLDGCOR	685172.4880	1670537.9035
360	669828.5970	1693339.1960	4077.44	TU/US-C503-STATION1	669634.4665	1692848.4306
361	669823.8520	1693340.4930	4077.30	TU/US-C503-STATION2	669629.7229	1692849.7272
362	669816.1660	1693331.0930	4077.32	TU/US-C503-STATION3	669622.0391	1692840.3299
363	669804.9830	1693324.1990	4077.14	TU/US-C503-STATION5	669610.8594	1692833.4379
364	669830.2120	1693344.6950	4077.63	TU/US-C503-STATION4	669636.0811	1692853.9280

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
365	669820.3680	1693343.5050	4078.10	TU/US-C503-USTTANK	669626.2399	1692852.7383
366	669826.9160	1693337.2450	4077.78	TU/US-C503-USTTANK	669632.7860	1692846.4802
367	669831.7020	1693342.9300	4077.73	TU/US-C503-USTTANK	669637.5706	1692852.1635
368	669817.5060	1693300.2710	4077.28	TU/US-C503-BLDGCOR	669623.3788	1692809.5169
369	669817.0280	1693314.4610	4077.69	TU/US-C503-BLDGCOR	669622.9009	1692823.7028
370	669870.4630	1693326.6030	4077.24	TU/US-C503-BLDGCOR	669676.3204	1692835.8412
371	669857.6770	1693326.9550	4077.12	TU/US-C503-BLDGCOR	669663.5381	1692836.1931
372	669799.9830	1693280.8270	4076.53	TU/US-C503-BLDGCOR	669605.8608	1692790.0785
373	669786.0040	1693280.0690	4077.00	TU/US-C503-BLDGCOR	669591.8859	1692789.3207
374	669753.1970	1693299.5360	4076.55	TU/US-C503-MW1-CASIN	669559.0884	1692808.7821
375	669753.0160	1693299.6510	4076.22	TU/US-C503-MW1-PVC	669558.9075	1692808.8971
376	669717.9520	1693348.6000	4074.92	TU/US-C503-MW3-PVC	669523.8536	1692857.8319
377	669718.0930	1693348.2730	4075.65	TU/US-C503-MW3-CASIN	669523.9946	1692857.5050
378	669746.8950	1693329.2100	4076.92	TU/US-C503-BLDGCOR	669552.7882	1692838.4475
379	669747.5820	1693308.1150	4076.21	TU/US-C503-BLDGCOR	669553.4750	1692817.3586
380	669906.5180	1693361.1640	4077.43	TU/US-C503-MW2-CASIN	669712.3650	1692870.3922
381	669906.2520	1693361.2650	4077.07	TU/US-C503-MW2-PVC	669712.0990	1692870.4932
382	669887.0390	1693344.8910	4077.53	TU/US-C503-BLDGCOR	669692.8916	1692854.1239
383	669886.0230	1693359.0930	4077.99	TU/US-C503-BLDGCOR	669691.8759	1692868.3218
384	670862.3470	1691695.2520	4072.78	TU/US-C500-MW1-CASIN	670667.9169	1691204.9630
385	670862.1340	1691695.4850	4072.39	TU/US-C500-MW1-PVC	670667.7040	1691205.1960
386	670897.1420	1691671.0590	4072.25	TU/US-C500-MW2-PVC	670702.7019	1691180.7771
387	670897.3420	1691670.8340	4072.66	TU/US-C500-MW2-CASIN	670702.9018	1691180.5521
388	670997.2710	1691721.0890	4072.90	TU/US-C500-MW3-CASIN	670802.8018	1691230.7926
389	670996.9840	1691721.2540	4072.41	TU/US-C500-MW3-PVC	670802.5149	1691230.9575
390	670952.1640	1691699.4910	4072.04	TU/US-C500-STATION1	670757.7079	1691209.2008
391	670948.0960	1691682.1740	4072.36	TU/US-C500-STATION4	670753.6411	1691191.8888
392	670936.4590	1691683.8290	4072.05	TU/US-C500-STATION5	670742.0075	1691193.5434
393	670929.6330	1691690.0950	4072.11	TU/US-C500-STATION2	670735.1834	1691199.8075
394	670923.0530	1691673.0510	4072.18	TU/US-C500-STATION3	670728.6054	1691182.7685
395	670946.5050	1691708.7370	4072.40	TU/US-C500-USTPIT	670752.0506	1691218.4441
396	670961.7540	1691693.8260	4072.62	TU/US-C500-USTPIT	670767.2951	1691203.5375
397	670931.1680	1691662.3970	4072.93	TU/US-C500-USTPIT	670736.7180	1691172.1176
398	670915.4940	1691676.4560	4072.43	TU/US-C500-USTPIT	670721.0485	1691186.1725
399	670921.7940	1691667.6910	4072.61	TU/US-C500-BLDGCOR	670727.3467	1691177.4100
400	670938.3020	1691685.3670	4072.19	TU/US-C500-BLDGCOR	670743.8499	1691195.0809
401	670954.8550	1691686.5260	4072.52	TU/US-C500-BLDGCOR	670760.3981	1691196.2396
402	670964.2580	1691691.8600	4072.50	TU/US-C500-BLDGCOR	670769.7984	1691201.5720
403	670981.1410	1691692.8760	4072.84	TU/US-C500-BLDGCOR	670786.6765	1691202.5877
404	681138.2190	1690535.4430	4109.80	OT-C538-MW1-CASING	680940.8108	1690045.4902
405	681137.9660	1690535.5040	4109.43	OT-C538-MW1-PVC	680940.5579	1690045.5512
406	681154.3000	1690506.8540	4109.64	OT-C538-STATION3	680956.8871	1690016.9095
407	681170.7650	1690504.3700	4110.30	OT-C538-STATION2	680973.3473	1690014.4262
408	681207.7160	1690542.9160	4110.07	OT-C538-STATION1	681010.2876	1690052.9610
409	681171.2020	1690513.1430	4110.35	OT-C538-SEPTIC	680973.7842	1690023.1966
410	681160.8350	1690514.8700	4110.22	OT-C538-SEPTIC	680963.4202	1690024.9231
411	681157.5830	1690502.2430	4109.87	OT-C538-SEPTIC	680960.1692	1690012.2998
412	681168.6240	1690500.8410	4110.30	OT-C538-SEPTIC	680971.2070	1690010.8982
413	681157.7430	1690507.8780	4109.92	OT-C538-FFLUEN	680960.3291	1690017.9332
414	681149.7900	1690513.8560	4109.82	OT-C538-FFLUEN	680952.3784	1690023.9094
415	681146.2870	1690511.1610	4109.76	OT-C538-LEACH	680948.8764	1690021.2152
416	681140.0690	1690516.2140	4109.76	OT-C538-LEACH	680942.6602	1690026.2667
417	681131.8360	1690535.6580	4109.59	OT-C538-LEACH	680934.4296	1690045.7051
418	681142.3480	1690541.6090	4109.45	OT-C538-LEACH	680944.9386	1690051.6544
419	681148.4850	1690524.6340	4109.80	OT-C538-LEACH	680951.0738	1690034.6843
420	681152.9240	1690518.6140	4110.01	OT-C538-LEACH	680955.5115	1690028.6661
421	681171.0630	1690513.0040	4110.32	OT-C538-EFLUEN	680973.6453	1690023.0577
422	681199.3120	1690534.6340	4109.92	OT-C538-EFLUEN	681001.8861	1690044.6814
423	681311.9210	1690619.8910	4111.94	OT-C538-EFLUEN	681114.4624	1690129.9137
424	681378.0600	1690614.8720	4112.52	OT-C538-EFLUEN	681180.5823	1690124.8962
425	681511.9950	1690621.0250	4112.35	OT-C538-EFLUEN-C/O	681314.4785	1690131.0474
426	681543.8210	1690614.3290	4112.13	OT-C538-EFLUEN-C/O	681346.2952	1690124.3533
427	681545.1500	1690624.0320	4110.59	OT-C538-EFLUEN	681347.6238	1690134.0535
428	681526.9290	1690617.7410	4112.19	OT-C538-BLDGCOR	681329.4081	1690127.7643
429	681516.5600	1690627.6780	4112.22	OT-C538-BLDGCOR	681319.0421	1690137.6984
430	681517.0030	1690674.6590	4112.55	OT-C538-BLDGCOR	681319.4850	1690184.6658
431	681526.9640	1690685.0850	4112.68	OT-C538-BLDGCOR	681329.4431	1690195.0888
432	681610.3380	1690617.1910	4112.15	OT-C538-BLDGCOR	681412.7929	1690127.2145
433	681620.0290	1690626.9090	4112.29	OT-C538-BLDGCOR	681422.4811	1690136.9297
434	681248.7970	1690511.7190	4110.11	OT-C537-STATION1	681051.3567	1690021.7731
435	681230.2540	1690505.9940	4109.96	OT-C537-STATION2	681032.8191	1690016.0497

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
436	681220.0430	1690509.7920	4110.12	OT-C537-STATION3	681022.6111	1690019.8466
437	681224.9030	1690501.6020	4109.95	OT-C537-SEPTICDRY	681027.4697	1690011.6590
438	681224.2220	1690518.0560	4110.28	OT-C537-SEPTICDRY	681026.7889	1690028.1082
439	681236.7540	1690518.9910	4110.31	OT-C537-SEPTICDRY	681039.3172	1690029.0429
440	681236.4080	1690501.8520	4110.13	OT-C537-SEPTICDRY	681038.9713	1690011.9089
441	681237.2180	1690508.8330	4110.12	OT-C537-INLINE	681039.7811	1690018.8879
442	681311.7430	1690515.4440	4111.03	OT-C537-INLINE	681114.2845	1690025.4970
443	670561.7210	1680587.5740	4050.10	TU/US-C506-MW2-CASIN	670367.3781	1680100.5043
444	670561.4170	1680587.6760	4049.68	TU/US-C506-MW2-PVC	670367.0742	1680100.6062
445	670504.3430	1680580.0920	4050.14	TU/US-C506-MW1-PVC	670310.0167	1680093.0244
446	670504.5340	1680580.0020	4050.56	TU/US-C506-MW1-CASIN	670310.2076	1680092.9345
447	670508.2600	1680580.6030	4050.26	TU/US-C506-USTTANK	670313.9326	1680093.5353
448	670507.1490	1680575.9500	4050.27	TU/US-C506-USTTANK	670312.8219	1680088.8836
449	670517.9280	1680578.9030	4050.27	TU/US-C506-USTTANK	670323.5978	1680091.8358
450	670517.4300	1680574.2280	4050.28	TU/US-C506-USTTANK	670323.0999	1680087.1621
451	670507.9350	1680578.1630	4050.18	TU/US-C506-STATION1	670313.6077	1680091.0960
452	670513.3690	1680579.8330	4050.20	TU/US-C506-STATION2	670319.0401	1680092.7655
453	670517.9640	1680576.4150	4050.25	TU/US-C506-STATION3	670323.6338	1680089.3485
454	670511.2330	1680575.3810	4050.12	TU/US-C506-STATION4	670316.9047	1680088.3148
455	670512.5770	1680577.6370	4050.16	TU/US-C506-STATION5	670318.2483	1680090.5702
456	670485.1820	1680557.6150	4050.53	TU/US-C506-EXMW1-CAS	670290.8613	1680070.5540
457	670484.8980	1680557.6790	4050.38	TU/US-C506-EXMW1-PVC	670290.5773	1680070.6179
458	670494.8180	1680553.5430	4050.36	TU/US-C506-BLDGCOR	670300.4945	1680066.4831
459	670506.7310	1680561.7710	4050.38	TU/US-C506-BLDGCOR	670312.4040	1680074.7088
460	670510.1770	1680607.5970	4050.36	TU/US-C506-BLDGCOR	670315.8490	1680120.5215
461	670507.2460	1680618.1900	4050.39	TU/US-C506-BLDGCOR	670312.9189	1680131.1114
462	672564.5350	1692766.5990	4084.67	OT-C530-STATION1	672369.6116	1692275.9995
463	672567.1650	1692774.7240	4084.79	OT-C530-STATION2	672372.2409	1692284.1222
464	672567.5210	1692771.2850	4084.93	OT-C530-ACTSEPTIC	672372.5967	1692280.6842
465	672572.0780	1692767.3740	4084.89	OT-C530-ACTSEPTIC	672377.1524	1692276.7743
466	672575.8660	1692771.9070	4084.91	OT-C530-ACTSEPTIC	672380.9393	1692281.3060
467	672571.4280	1692775.8290	4084.95	OT-C530-ACTSEPTIC	672376.5026	1692285.2269
468	672569.6900	1692769.3550	4084.91	OT-C530-INLINE	672374.7651	1692278.7547
469	672563.6000	1692772.1360	4084.83	OT-C530-MW-CASING	672368.6769	1692281.5349
470	672563.2920	1692772.2960	4084.49	OT-C530-MW-PVC	672368.3690	1692281.6949
471	672509.9810	1692700.4750	4085.41	OT-C530-INLINE	672315.0734	1692209.8947
472	672538.3940	1692677.7240	4085.37	OT-C530-BLDGCOR	672343.4782	1692187.1503
473	672538.9710	1692663.8680	4085.27	OT-C530-BLDGCOR	672344.0550	1692173.2983
474	672478.3960	1692731.8290	4085.45	OT-C530-BLDGCOR	672283.4976	1692241.2396
475	672485.2490	1692739.1720	4085.12	OT-C530-BLDGCOR	672290.3486	1692248.5805
476	685978.3640	1686617.0530	4101.95	OT-C534-STATION1	685779.5530	1686128.2358
477	685949.9370	1686623.2970	4101.80	OT-C534-STATION2	685751.1342	1686134.4780
478	686041.6810	1686591.0650	4102.58	OT-C534-BLDGCOR	685842.8517	1686102.2553
479	686050.4200	1686580.6970	4102.78	OT-C534-BLDGCOR	685851.5881	1686091.8903
480	686053.7100	1686616.8100	4102.90	OT-C534-BLDGCOR	685854.8772	1686127.9929
481	686043.1140	1686607.6280	4102.82	OT-C534-BLDGCOR	685844.2842	1686118.8135
482	670482.5190	1680558.2400	4050.60	TU/US-C506-MW3-CASIN	670288.1990	1680071.1788
483	670482.3210	1680558.1750	4050.11	TU/US-C506-MW3-PVC	670288.0011	1680071.1138
484	669451.6250	1685381.2210	4054.88	TU/US-C515-STATION1	669257.6038	1684892.7620
485	669456.5920	1685373.9060	4054.66	TU/US-C515-STATION2	669262.5694	1684885.4491
486	669447.7270	1685364.3830	4054.13	TU/US-C515-STATION3	669253.7069	1684875.9289
487	669442.7430	1685375.3260	4054.34	TU/US-C515-STATION4	669248.7244	1684886.8687
488	669450.0780	1685373.9310	4054.62	TU/US-C515-STATION5	669256.0572	1684885.4741
489	669529.8630	1685390.3120	4053.57	TU/US-C515-MW3-PVC	669335.8191	1684901.8503
490	669530.0710	1685390.1630	4053.84	TU/US-C515-MW3-CASIN	669336.0271	1684901.7014
491	669347.3380	1685357.3580	4053.37	TU/US-C515-MW2-CASIN	669153.3470	1684868.9059
492	669347.0390	1685357.4240	4052.93	TU/US-C515-MW2-PVC	669153.0481	1684868.9719
493	669367.7310	1685396.1250	4053.43	TU/US-C515-MW1-PVC	669173.7341	1684907.6617
494	669368.0180	1685396.0880	4053.86	TU/US-C515-MW1-CASIN	669174.0210	1684907.6247
495	669413.7390	1685386.4140	4054.97	TU/US-C515-BLDGCOR	669219.7288	1684897.9535
496	669405.0760	1685397.5400	4056.39	TU/US-C515-BLDGCOR	669211.0683	1684909.0762
497	669442.6490	1685383.8010	4054.90	TU/US-C515-TANKPIT	669248.6304	1684895.3412
498	669458.4310	1685381.6630	4055.08	TU/US-C515-TANKPIT	669264.4078	1684893.2039
499	669454.7400	1685363.6010	4054.47	TU/US-C515-TANKPIT	669260.7179	1684875.1471
500	669440.8050	1685364.3540	4054.07	TU/US-C515-TANKPIT	669246.7869	1684875.8999
501	669474.3460	1685377.9770	4054.82	TU/US-C515-BLDGCOR	669280.3182	1684889.5189
502	669485.4880	1685386.3880	4055.07	TU/US-C515-BLDGCOR	669291.4570	1684897.9275
503	669257.8420	1685415.0700	4053.20	TU/US-C513-STATION3	669063.8770	1684926.6012
504	669241.6200	1685431.8260	4053.43	TU/US-C513-STATION2	669047.6597	1684943.3523
505	669234.6840	1685421.2410	4053.75	TU/US-C513-STATION5	669040.7257	1684932.7704
506	669232.2550	1685409.8190	4053.42	TU/US-C513-STATION4	669038.2974	1684921.3517

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

Corrections

Point #515
TU/US-515-MW3 PVC

Point #518
TU/US-515-MW2

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
507	669220.1400	1685422.8010	4053.52	TU/US-C513-STATION1	669026.1859	1684934.3299
508	669222.4590	1685431.2530	4053.64	TU/US-C513-TANKPIT	669028.5042	1684942.7795
509	669219.3990	1685411.0450	4054.92	TU/US-C513-TANKPIT	669025.4451	1684922.5773
510	669260.7320	1685426.0370	4053.70	TU/US-C513-TANKPIT	669066.7661	1684937.5650
511	669277.6950	1685433.5720	4053.31	TU/US-C513-MW2-CASIN	669083.7242	1684945.0978
512	669243.5650	1685418.8110	4054.36	TU/US-C513-TRANSPAD	669049.6041	1684930.3411
513	669236.4970	1685419.8090	4054.30	TU/US-C513-TRANSPAD	669042.5381	1684931.3388
514	669235.5680	1685411.9050	4054.57	TU/US-C513-TRANSPAD	669041.6094	1684923.4371
515	669277.6850	1685433.6210	4053.26	TU/US-C513-MW2-C[illegible] PVC	669083.7142	1684945.1468 → MW3
516	669188.9570	1685441.5400	4053.76	TU/US-C513-MW1-CASIN	668995.0119	1684953.0635
517	669188.7180	1685441.6230	4053.31	TU/US-C513-MW1-PVC	668994.7730	1684953.1465
518	669175.0530	1685411.5360	4053.78	TU/US-C513-MW3-PVC	668981.1120	1684923.0682 → MW2
519	669175.2900	1685411.4450	4054.15	TU/US-C513-MW3-CASIN	668981.3489	1684922.9772
520	669194.6820	1685411.4540	4054.72	TU/US-C513-BLDGCOR	669000.7353	1684922.9862
521	669205.8290	1685420.1440	4054.47	TU/US-C513-BLDGCOR	669011.8790	1684931.6737
522	669292.6520	1685418.3920	4053.83	TU/US-C513-BLDGCOR	669098.6769	1684929.9222
523	669293.9380	1685428.2990	4053.77	TU/US-C513-BLDGCOR	669099.9625	1684939.8263
524	685879.9040	1686627.7590	4102.02	OTC-534-CASING	685681.1215	1686138.9387
525	685879.6290	1686627.7910	4101.61	OTC-534-PVC	685680.8466	1686138.9707
526	685894.0510	1686651.2940	4102.15	OTC-534-MW6-CASING	685695.2644	1686162.4669
527	685893.7240	1686651.3020	4101.74	OTC-534-MW6-PVC	685694.9375	1686162.4749
528	685866.3710	1686655.8860	4101.59	OTC-534-MW8-PVC	685667.5925	1686167.0576
529	685866.6060	1686655.6520	4102.06	OTC-534-MW8-CASING	685667.8274	1686166.8236
530	685876.1160	1686687.3140	4102.11	OTC-534-MW5-CASING	685677.3346	1686198.4764
531	685875.8760	1686687.4250	4101.81	OTC-534-MW5-PVC	685677.0947	1686198.5874
532	685834.9910	1686704.4610	4101.83	OTC-534-MW9-PVC	685636.2216	1686215.6185
533	685835.2820	1686704.5300	4102.15	OTC-534-MW9-CASING	685636.5125	1686215.6875
534	685772.4780	1686595.2240	4101.45	OTC-534-MW10-NG	685573.7267	1686106.4131
535	669081.1480	1678793.1860	4046.72	OTC-531B-SEPTANK	668887.2342	1678306.6363
536	669082.4390	1678801.3130	4046.63	OTC-531B-SEPTANK	668888.5248	1678314.7610
537	669072.3810	1678802.9790	4046.81	OTC-531B-SEPTANK	668878.4697	1678316.4265
538	669070.8860	1678795.3530	4046.82	OTC-531B-SEPTANK	668876.9751	1678308.8027
539	669104.1410	1678787.7690	4045.69	OTC-531B-STATION-1	668910.2205	1678301.2209
540	669070.9690	1678801.9800	4046.52	OTC-531B-STATION-2	668877.0581	1678315.4278
541	669061.4820	1678787.2510	4046.24	OTC-531B-STATION-3	668867.5739	1678300.7031
542	669022.2810	1678760.4940	4045.98	OTC-531B-MW-1-PVC	668828.3842	1678273.9538
543	669022.4740	1678760.4670	4046.35	OTC-531B-MW-1-CASING	668828.5772	1678273.9268
544	669029.7060	1678750.8610	4046.12	OTC-531B-LEACH	668835.8071	1678264.3236
545	669044.0770	1678753.3070	4046.04	OTC-531B-LEACH	668850.1739	1678266.7689
546	669048.2090	1678762.3910	4046.19	OTC-531B-LEACH	668854.3047	1678275.8503
547	669052.8600	1678773.5200	4046.17	OTC-531B-LEACH	668858.9544	1678286.9760
548	669051.8580	1678782.0380	4046.19	OTC-531B-LEACH	668857.9527	1678295.4916
549	669045.9680	1678791.0410	4045.97	OTC-531B-LEACH	668852.0644	1678304.4920
550	669037.6080	1678787.3270	4046.05	OTC-531B-LEACH	668843.7068	1678300.7790
551	669030.8940	1678787.9690	4046.07	OTC-531B-LEACH	668836.9947	1678301.4208
552	669024.6850	1678794.4050	4045.99	OTC-531B-LEACH	668830.7875	1678307.8550
553	669012.0060	1678808.0140	4045.98	OTC-531B-LEACH	668818.1122	1678321.4600
554	669005.0390	1678788.3970	4045.95	OTC-531B-LEACH	668811.1472	1678301.8487
555	669008.1540	1678771.5710	4046.05	OTC-531B-LEACH	668814.2613	1678285.0276
556	669012.3090	1678761.0960	4046.10	OTC-531B-LEACH	668818.4151	1678274.5556
557	669052.5660	1678784.6580	4046.08	OTC-531B-FLINE	668858.6605	1678298.1108
558	669071.4380	1678798.9230	4046.55	OTC-531B-FLINE	668877.5270	1678312.3717
559	669082.2160	1678797.7200	4046.58	OTC-531B-ELINE	668888.3019	1678311.1690
560	669109.7160	1678792.3340	4045.64	OTC-531B-ELINE	668915.7939	1678305.7846
561	669130.6340	1678787.5660	4047.05	OTC-531B-ELINE	668936.7058	1678301.0180
562	669132.6960	1678800.0880	4046.87	OTC-531B-BLDGCOR	668938.7672	1678313.5363
563	669139.6540	1678804.9540	4046.97	OTC-531B-BLDGCOR	668945.7232	1678318.4009
564	669127.3740	1678771.5760	4046.72	OTC-531B-BLDGCOR	668933.4468	1678285.0326
565	669131.8520	1678764.6150	4047.25	OTC-531B-BLDGCOR	668937.9235	1678278.0736
566	668593.1300	1678901.9680	4046.19	OTC-531C-BLDGCOR	668399.3576	1678415.3868
567	668588.1250	1678902.8360	4046.21	OTC-531C-BLDGCOR	668394.3541	1678416.2546
568	668585.3350	1678865.5840	4046.55	OTC-531C-BLDGCOR	668391.5649	1678379.0133
569	668590.1110	1678858.6070	4046.53	OTC-531C-BLDGCOR	668396.3395	1678372.0384
570	668590.3090	1678889.4560	4045.95	OTC-531C-ELINE	668396.5374	1678402.8784
571	668578.4210	1678891.4650	4046.03	OTC-531C-ELINE	668384.6529	1678404.8868
572	668560.7680	1678894.7530	4045.47	OTC-531C-ELINE	668367.0050	1678408.1739
573	668535.6480	1678899.2930	4046.35	OTC-531C-ELINE	668341.8923	1678412.7126
574	668535.0660	1678896.4960	4046.68	OTC-531C-SEPTIC	668341.3104	1678409.9164
575	668535.3940	1678905.9700	4046.47	OTC-531C-SEPTIC	668341.6383	1678419.3876
576	668522.2510	1678906.9450	4046.51	OTC-531C-SEPTIC	668328.4992	1678420.3624
577	668522.3100	1678897.4040	4046.39	OTC-531C-SEPTIC	668328.5581	1678410.8241

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
578	668561.9930	1678890.5660	4045.66	OTC-531C-STATION-1	668368.2296	1678403.9881
579	668531.2500	1678902.0810	4046.55	OTC-531C-STATION-2	668337.4955	1678415.4998
580	668522.9580	1678893.5110	4045.84	OTC-531C-STATION-3	668329.2059	1678406.9323
581	668521.6100	1678902.7660	4046.16	OTC-531C-FLINE	668327.8583	1678416.1846
582	668515.2610	1678901.5740	4045.66	OTC-531C-FLINE	668321.5112	1678414.9929
583	668515.8520	1678907.4010	4045.67	OTC-531C-LEACH	668322.1020	1678420.8182
584	668498.6960	1678906.8280	4045.81	OTC-531C-LEACH	668304.9510	1678420.2454
585	668489.9270	1678907.6430	4045.74	OTC-531C-LEACH	668296.1845	1678421.0602
586	668481.5760	1678902.8790	4045.69	OTC-531C-LEACH	668287.8359	1678416.2975
587	668476.1180	1678891.3230	4045.84	OTC-531C-LEACH	668282.3795	1678404.7449
588	668473.4290	1678883.0340	4045.68	OTC-531C-LEACH	668279.6913	1678396.4583
589	668473.7340	1678874.2510	4045.53	OTC-531C-LEACH	668279.9962	1678387.6778
590	668476.2360	1678867.2340	4045.54	OTC-531C-LEACH	668282.4975	1678380.6629
591	668482.1720	1678868.3950	4045.45	OTC-531C-MW-1-PVC	668288.4318	1678381.8235
592	668482.4510	1678868.3680	4045.85	OTC-531C-MW-1-CASING	668288.7107	1678381.7965
593	668490.9400	1678863.0190	4045.60	OTC-531C-LEACH	668297.1972	1678376.4491
594	668503.3450	1678866.8310	4045.87	OTC-531C-LEACH	668309.5986	1678380.2600
595	668508.4050	1678874.1920	4045.93	OTC-531C-LEACH	668314.6572	1678387.6189
596	668515.8970	1678879.7420	4045.82	OTC-531C-LEACH	668322.1470	1678393.1672
597	668524.3970	1678890.3500	4045.70	OTC-531C-LEACH	668330.6445	1678403.7722
598	667495.6300	1679128.7300	4042.53	OTC-532-BLDGCOR	667302.1757	1678642.0831
599	667488.6400	1679123.9580	4042.71	OTC-532-BLDGCOR	667295.1877	1678637.3125
600	667462.6660	1679059.4970	4041.10	OTC-532-BLDGCOR	667269.2212	1678572.8701
601	667481.1840	1679050.1710	4042.61	OTC-532-BLDGCOR	667287.7339	1678563.5469
602	667486.0130	1679106.7520	4042.73	OTC-532-ELINE	667292.5615	1678620.1115
603	667462.4800	1679111.5030	4040.38	OTC-532-ELINE	667269.0353	1678624.8611
604	667462.2250	1679114.4150	4040.62	OTC-532-STATION-1	667268.7804	1678627.7722
605	667442.0090	1679119.1410	4041.24	OTC-532-STATION-2	667248.5702	1678632.4969
606	667419.1640	1679115.1840	4040.86	OTC-532-STATION-3	667225.7319	1678628.5410
607	667385.6930	1679101.6040	4040.50	OTC-532-STATION-4	667192.2706	1678614.9649
608	667381.8850	1679101.5680	4040.62	OTC-532-LEACH	667188.4637	1678614.9290
609	667383.6400	1679091.6130	4040.63	OTC-532-LEACH	667190.2181	1678604.9768
610	667385.4250	1679087.0370	4040.57	OTC-532-LEACH	667192.0026	1678600.4022
611	667388.9960	1679084.4040	4040.65	OTC-532-LEACH	667195.5726	1678597.7699
612	667394.2390	1679084.6140	4040.73	OTC-532-LEACH	667200.8141	1678597.9799
613	667396.1210	1679092.7430	4040.70	OTC-532-LEACH	667202.6955	1678606.1065
614	667398.1240	1679100.9150	4040.70	OTC-532-LEACH	667204.6979	1678614.2761
615	667402.2360	1679106.9240	4040.75	OTC-532-LEACH	667208.8088	1678620.2834
616	667410.1270	1679109.8530	4040.82	OTC-532-LEACH	667216.6975	1678623.2116
617	667419.4540	1679110.1630	4040.85	OTC-532-LEACH	667226.0218	1678623.5215
618	667420.7270	1679120.1400	4041.02	OTC-532-FLINE	667227.2944	1678633.4956
619	667423.8510	1679141.7780	4040.59	OTC-532-LEACH	667230.4175	1678655.1273
620	667412.2990	1679143.4760	4040.74	OTC-532-LEACH	667218.8688	1678656.8248
621	667403.7350	1679143.1670	4040.80	OTC-532-LEACH	667210.3073	1678656.5159
622	667397.0900	1679139.6510	4040.75	OTC-532-LEACH	667203.6642	1678653.0009
623	667384.3300	1679127.9250	4040.44	OTC-532-LEACH	667190.9079	1678641.2783
624	667382.6070	1679116.1130	4040.44	OTC-532-LEACH	667189.1854	1678629.4697
625	667430.4810	1679118.6630	4041.32	OTC-532-FLINE	667237.0456	1678632.0190
626	667430.2210	1679114.2980	4041.25	OTC-532-SEPTIC	667236.7856	1678627.6553
627	667440.5880	1679113.0200	4041.26	OTC-532-SEPTIC	667247.1496	1678626.3776
628	667442.9470	1679123.3120	4041.21	OTC-532-SEPTIC	667249.5080	1678636.6667
629	667430.1210	1679125.8580	4041.28	OTC-532-SEPTIC	667236.6857	1678639.2119
630	667441.8110	1679116.2010	4041.27	OTC-532-ELINE	667248.3723	1678629.5577
631	669659.5140	1678688.1920	4048.05	OTC-531A-ELINE	669465.4326	1678201.6728
632	669645.1200	1678691.4170	4047.42	OTC-531A-ELINE	669451.0427	1678204.8968
633	669626.5240	1678694.6570	4048.54	OTC-531A-ELINE	669432.4521	1678208.1359
634	669625.4550	1678690.5680	4048.58	OTC-531A-SEPTIC	669431.3834	1678204.0481
635	669627.0130	1678697.2200	4048.59	OTC-531A-SEPTIC	669432.9410	1678210.6981
636	669614.1180	1678700.1730	4048.60	OTC-531A-SEPTIC	669420.0497	1678213.6503
637	669613.0940	1678693.8150	4048.72	OTC-531A-SEPTIC	669419.0260	1678207.2941
638	669648.5430	1678685.0250	4047.24	OTC-531A-STATION-1	669454.4647	1678198.5067
639	669615.3510	1678691.9600	4048.59	OTC-531A-STATION-2	669421.2823	1678205.4397
640	669607.0140	1678691.1700	4048.42	OTC-531A-STATION-3	669412.9478	1678204.6499
641	669606.7200	1678688.2040	4048.56	OTC-531A-LEACH	669412.6539	1678201.6848
642	669608.9270	1678706.1330	4048.28	OTC-531A-LEACH	669414.8602	1678219.6086
643	669601.3790	1678707.8980	4048.13	OTC-531A-LEACH	669407.3144	1678221.3730
644	669593.2420	1678708.2220	4047.49	OTC-531A-LEACH	669399.1798	1678221.6970
645	669578.1380	1678708.5010	4047.22	OTC-531A-LEACH	669384.0801	1678221.9759
646	669565.0490	1678706.1840	4047.29	OTC-531A-LEACH	669370.9949	1678219.6595
647	669554.2260	1678694.3690	4047.37	OTC-531A-LEACH	669360.1751	1678207.8480
648	669553.4160	1678687.6760	4047.59	OTC-531A-LEACH	669359.3653	1678201.1569

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
649	669552.5940	1678678.4030	4047.76	OTC-531A-LEACH	669358.5435	1678191.8866
650	669550.0120	1678656.4050	4047.76	OTC-531A-LEACH	669355.9623	1678169.8950
651	669556.1880	1678652.3190	4047.86	OTC-531A-LEACH	669362.1365	1678165.8102
652	669559.2580	1678655.8340	4047.38	OTC-531A-MW-1-PVC	669365.2056	1678169.3241
653	669559.5100	1678655.7600	4047.78	OTC-531A-MW-1-CASING	669365.4575	1678169.2502
654	669561.9190	1678650.8880	4047.69	OTC-531A-LEACH	669367.8658	1678164.3796
655	669569.0970	1678659.8040	4048.02	OTC-531A-LEACH	669375.0418	1678173.2930
656	669574.5390	1678669.0420	4047.77	OTC-531A-LEACH	669380.4822	1678182.5283
657	669580.0480	1678677.6210	4047.77	OTC-531A-LEACH	669385.9896	1678191.1048
658	669581.1180	1678685.2190	4047.72	OTC-531A-LEACH	669387.0593	1678198.7006
659	669589.3790	1678690.0080	4047.91	OTC-531A-LEACH	669395.3179	1678203.4882
660	669598.7410	1678687.4540	4047.88	OTC-531A-LEACH	669404.6772	1678200.9350
661	669608.6000	1678697.8630	4048.38	OTC-531A-FLINE	669414.5333	1678211.3410
662	669613.4950	1678697.0050	4048.61	OTC-531A-FLINE	669419.4269	1678210.4832
663	669434.7190	1685385.1220	4055.15	US/TC-515-EXAVATION	669240.7027	1684896.6618
664	669433.7320	1685375.0770	4054.68	US/TC-515-EXAVATION	669239.7160	1684886.6198
665	669453.6100	1685372.2880	4054.89	US/TC-515-EXAVATION	669259.5882	1684883.8316
666	669455.2490	1685382.6100	4055.08	US/TC-515-EXAVATION	669261.2268	1684894.1506
667	669423.1290	1685379.3360	4054.73	US/TC-515-POTHOLE-1	669229.1161	1684890.8775
668	669443.7270	1685362.1260	4054.20	US/TC-515-POTHOLE-2	669249.7081	1684873.6725
669	669443.2340	1685352.4030	4053.69	US/TC-515-POTHOLE-3	669249.2152	1684863.9523
670	669388.8600	1685382.9350	4054.36	US/TC-515-POTHOLE-4	669194.8570	1684894.4755
671	666075.3380	1693454.3920	4059.75	US/TC-502-TANK/EX	665882.2953	1692963.5932
672	666064.5480	1693454.6090	4059.59	US/TC-502-TANK/EX	665871.5084	1692963.8101
673	666064.5890	1693463.2320	4059.66	US/TC-502-TANK/EX	665871.5494	1692972.4306
674	666075.7420	1693463.6580	4059.85	US/TC-502-TANK/EX	665882.6992	1692972.8565
675	666070.2430	1693458.8620	4059.56	US/TC-502-STATION-1	665877.2018	1692968.0619
676	666075.3470	1693459.1030	4059.61	US/TC-502-STATION-2	665882.3043	1692968.3028
677	666070.4890	1693455.0470	4059.46	US/TC-502-STATION-3	665877.4477	1692964.2480
678	666070.2650	1693463.1340	4059.49	US/TC-502-STATION-4	665877.2238	1692972.3327
679	666072.2440	1693503.2780	4060.12	US/TC-502-FIREHY	665879.2022	1693012.4650
680	669813.9600	1693315.1950	4077.70	US/TC-503-EXAVATION	669619.8338	1692824.4365
681	669826.0790	1693326.7460	4077.45	US/TC-503-EXAVATION	669631.9493	1692835.9842
682	669815.4720	1693337.1950	4077.67	US/TC-503-EXAVATION	669621.3454	1692846.4302
683	669803.8000	1693324.4750	4077.59	US/TC-503-EXAVATION	669609.6767	1692833.7139
684	669818.2990	1693319.1730	4077.48	US/TC-503-BEGTRENCH	669624.1715	1692828.4134
685	669837.0790	1693303.2490	4076.88	US/TC-503-ENDTRENCH	669642.9461	1692812.4940
686	681138.0180	1690539.4590	4109.33	OTC-538-STATION-5	680940.6098	1690049.5050
687	673758.3950	1683356.5480	4060.55	US/TC-514-STATION-1	673563.1256	1682868.6758
688	673765.5540	1683358.1250	4060.47	US/TC-514-STATION-2	673570.2825	1682870.2523
689	673770.0890	1683350.4240	4060.48	US/TC-514-STATION-3	673574.8162	1682862.5535
690	673768.2490	1683354.2670	4060.48	US/TC-514-STATION-4	673572.9768	1682866.3954
691	673777.4280	1683353.4050	4060.71	US/TC-514-STATION-5	673582.1531	1682865.5337
692	673776.8350	1683359.0390	4060.94	US/TC-514-BLDGCOR	673581.5603	1682871.1661
693	673769.7480	1683353.9100	4060.70	US/TC-514-BLDGCOR	673574.4753	1682866.0385
694	673778.8570	1683370.4750	4060.92	US/TC-514-BLDGCOR	673583.5817	1682882.5987
695	673773.9440	1683377.3380	4060.70	US/TC-514-BLDGCOR	673578.6701	1682889.4597
696	673723.3370	1683411.0030	4060.56	US/TC-514-MW-1-PVC	673528.0778	1682923.1150
697	673723.6160	1683410.9000	4061.02	US/TC-514-MW-1-CASIN	673528.3567	1682923.0120
698	673699.2890	1683380.7720	4061.09	US/TC-514-MW-2-CASIN	673504.0367	1682892.8928
699	673698.9660	1683380.8260	4060.66	US/TC-514-MW-2-PVC	673503.7138	1682892.9467
700	673812.5550	1683317.4880	4060.43	US/TC-514-MW-3-PVC	673617.2699	1682829.6271
701	673812.8820	1683317.4350	4060.76	US/TC-514-MW-3-CASIN	673617.5968	1682829.5741
702	673776.7270	1683350.1350	4060.82	US/TC-514-FORM/TANK	673581.4523	1682862.2646
703	673777.3420	1683356.4370	4060.94	US/TC-514-FORM/TANK	673582.0671	1682868.5648
704	673759.1130	1683359.4810	4061.06	US/TC-514-FORM/TANK	673563.8434	1682871.6079
705	673757.7990	1683353.3170	4061.32	US/TC-514-FORM/TANK	673562.5298	1682865.4457
706	678061.9490	1684350.2580	4078.63	US/TC-516-FORMTANK	677865.4323	1683862.0978
707	678072.0100	1684348.4740	4078.61	US/TC-516-FORMTANK	677875.4904	1683860.3143
708	678074.0860	1684360.1530	4078.25	US/TC-516-FORMTANK	677877.5658	1683871.9899
709	678065.1290	1684362.4260	4078.47	US/TC-516-FORMTANK	677868.6114	1683874.2622
710	678069.6040	1684359.8850	4078.30	US/TC-516-STATION-1	677873.0851	1683871.7220
711	678064.5960	1684356.9350	4078.34	US/TC-516-STATION-2	677868.0786	1683868.7728
712	678066.1670	1684350.4200	4078.54	US/TC-516-STATION-3	677869.6491	1683862.2597
713	678072.9250	1684354.8490	4078.09	US/TC-516-STATION-4	677876.4052	1683866.6874
714	678101.7280	1684311.2380	4077.72	US/TC-516-MW-2	677905.1998	1683823.0891
715	678116.9250	1684291.3650	4077.78	US/TC-516-MW-2	677920.3924	1683803.2218
716	678061.7680	1684335.2520	4080.38	US/TC-516-BLDGCOR	677865.2514	1683847.0961
717	678064.6310	1684348.2080	4081.07	US/TC-516-BLDGCOR	677868.1136	1683860.0484
718	678026.7560	1684390.7900	4078.49	US/TC-516-MW-1	677830.2495	1683902.6180
719	678014.0050	1684363.8290	4077.81	US/TC-516-MW-3	677817.5022	1683875.6648

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
720	671269.9880	1692357.3370	4075.08	US/TC-508-FORM/TANK	671075.4398	1691866.8562
721	671299.4450	1692330.8640	4075.18	US/TC-508-FORM/TANK	671104.8883	1691840.3908
722	671324.3300	1692358.5130	4075.17	US/TC-508-FORM/TANK	671129.7661	1691868.0318
723	671294.8560	1692384.8580	4075.02	US/TC-508-FORM/TANK	671100.3006	1691894.3692
724	671311.5950	1692346.0080	4075.12	US/TC-508-STATION-2	671117.0347	1691855.5304
725	671302.2680	1692357.1830	4075.07	US/TC-508-STATION-1	671107.7104	1691866.7022
726	671312.4640	1692368.2800	4074.98	US/TC-508-STATION-4	671117.9035	1691877.7960
727	671282.5110	1692369.9060	4075.01	US/TC-508-STATION-3	671087.9592	1691879.4215
728	671289.2400	1692342.4620	4075.15	US/TC-508-STATION-5	671094.6862	1691851.9855
729	671373.3210	1692386.6060	4075.00	US/TC-508-MW-3-PVC	671178.7429	1691896.1167
730	671373.6120	1692386.5000	4075.33	US/TC-508-MW-3-CASIN	671179.0338	1691896.0107
731	671216.9160	1692488.1670	4075.54	US/TC-508-SS18-MW08-CASIN	671022.3832	1691997.6482
732	671216.7110	1692488.4340	4075.26	US/TC-508-SS18-MW08-PVC	671022.1782	1691997.9152
733	671236.3110	1692301.9320	4075.19	US/TC-508-MW-2-CASIN	671041.7726	1691811.4672
734	671236.1240	1692302.1450	4074.80	US/TC-508-MW-2-PVC	671041.5856	1691811.6801
735	671211.3090	1692324.4610	4075.35	US/TC-508-MW-1-CASIN	671016.7778	1691833.9897
736	671211.0360	1692324.6620	4074.93	US/TC-508-MW-1-PVC	671016.5049	1691834.1906
737	671174.1880	1692241.9700	4074.81	US/TC-508-SS18-MW16-PVC	670979.6676	1691751.5226
738	671174.4770	1692241.7880	4075.34	US/TC-508-SS18-MW16-CASIN	670979.9565	1691751.3406
739	671035.8870	1692106.1030	4074.42	US/TC-508-SS18-MW18-CASIN	670841.4066	1691615.6950
740	671035.6230	1692106.3690	4073.74	US/TC-508-SS18-MW18-PVC	670841.1427	1691615.9609
741	671043.1730	1692355.2630	4075.73	US/TC-508-SS18-MW19-PVC	670848.6905	1691864.7828
742	670383.2120	1691278.5670	4072.57	US/TC-504-MW-2-CASIN	670188.9208	1690788.3988
743	670383.0220	1691278.7790	4072.19	US/TC-504-MW-2-PVC	670188.7309	1690788.6107
744	670343.7050	1691297.2270	4072.57	US/TC-504-MW-1-PVC	670149.4253	1690807.0534
745	670343.9460	1691296.8630	4072.80	US/TC-504-MW-1-CASIN	670149.6662	1690806.6895
746	669680.3630	1678704.0610	4048.54	OTC-531A-BLDGCOR	669486.2755	1678217.5372
747	669673.4280	1678699.1340	4048.44	OTC-531A-BLDGCOR	669479.3425	1678212.6116
748	669662.1160	1678671.3190	4048.32	OTC-531A-BLDGCOR	669468.0338	1678184.8047
749	669671.0810	1678657.6480	4048.29	OTC-531A-BLDGCOR	669476.9962	1678171.1376
750	669671.6690	1678686.6260	4048.54	OTC-531A-ELINE	669477.5840	1678200.1072
751	670995.2900	1691723.6540	4072.55	US/TC-500-STATION-6	670800.8214	1691233.3568
752	682707.7150	1693994.3080	4139.12	OTC-539-SEPTIC	682509.8519	1693503.3527
753	682707.1360	1693987.5070	4139.01	OTC-539-SEPTIC	682509.2731	1693496.5537
754	682713.9270	1693987.3840	4139.07	OTC-539-SEPTIC	682516.0621	1693496.4307
755	682714.4020	1693993.8490	4139.12	OTC-539-SEPTIC	682516.5370	1693502.8939
756	682710.5050	1693994.2530	4139.11	OTC-539-ELINE	682512.6411	1693503.2977
757	682711.7750	1694038.3560	4139.83	OTC-539-ELINE	682513.9107	1693547.3880
758	682709.6340	1694009.1330	4139.38	OTC-539-STATION-1	682511.7704	1693518.1734
759	682715.9010	1693990.7160	4139.12	OTC-539-STATION-2	682518.0355	1693499.7618
760	682707.9950	1693985.7400	4139.05	OTC-539-STATION-3	682510.1318	1693494.7872
761	682690.1540	1693966.7430	4138.58	OTC-539-STATION-4	682492.2960	1693475.7957
762	682700.5510	1693984.6270	4139.10	OTC-539-LEACH	682502.6900	1693493.6745
763	682694.7220	1693978.9800	4138.75	OTC-539-LEACH	682496.8627	1693488.0292
764	682685.8570	1693975.5370	4138.62	OTC-539-LEACH	682488.0002	1693484.5872
765	682686.8260	1693963.6500	4138.56	OTC-539-LEACH	682488.9690	1693472.7036
766	682690.9260	1693959.9730	4138.78	OTC-539-LEACH	682493.0678	1693469.0277
767	682696.9840	1693956.9410	4138.94	OTC-539-LEACH	682499.1240	1693465.9966
768	682705.4410	1693958.5980	4139.12	OTC-539-LEACH	682507.5786	1693467.6531
769	682714.7430	1693968.3290	4139.32	OTC-539-LEACH	682516.8779	1693477.3813
770	682721.4010	1693976.8710	4139.30	OTC-539-LEACH	682523.5339	1693485.9208
771	682717.7930	1693983.8070	4139.35	OTC-539-LEACH	682519.9270	1693492.8548
772	682710.1830	1693984.5790	4139.16	OTC-539-FLINE	682512.3192	1693493.6265
773	682710.2190	1693987.2160	4139.18	OTC-539-FLINE	682512.3552	1693496.2628
774	682690.6020	1694039.4720	4139.43	OTC-539-BLDGCOR	682492.7439	1693548.5036
775	682684.8200	1694045.5030	4139.27	OTC-539-BLDGCOR	682486.9635	1693554.5329
776	682741.4000	1694039.0240	4140.22	OTC-539-BLDGCOR	682543.5271	1693548.0558
777	682747.1830	1694045.0970	4140.68	OTC-539-BLDGCOR	682549.3085	1693554.1270

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7824
PROFESSIONAL SURVEYOR

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
778	686068.4560	1686694.7280	4103.68	OTC-534-MW-10-PVC	685869.6189	1686205.8883
779	686068.7800	1686694.7810	4104.06	OTC-534-MW-10-CASING	685869.9428	1686205.9413
780	685846.6180	1686522.2590	4102.52	OTC-534-MW-11-CASING	685647.8452	1686033.4693
781	685846.3620	1686522.2240	4102.15	OTC-534-MW-11-PVC	685647.5893	1686033.4343
782	685670.3280	1686561.9490	4102.29	OTC-534-MW-12-PVC	685471.6063	1686073.1478
783	685670.6410	1686561.9860	4102.69	OTC-534-MW-12-CASING	685471.9192	1686073.1848

RAW DATA

HOLLOMAN AIR FORCE BASE
WEST SITE

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	684793.2210	1611172.5300	3911.93	BASE	684598.9178	1610715.3759
2	682531.9480	1628747.6200	3965.57	EC-30	682338.2864	1628285.4792
3	682452.1330	1628714.0920	3957.20	EC-30-2	682258.4940	1628251.9607
4	698323.2620	1606321.3780	3915.08	CHAS	698125.1198	1605865.6004
5	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
60	616427.1730	1576921.6540	3941.67	LUCERO	616252.2680	1576474.2182
61	600657.7750	1576446.9260	4131.58	GERI	600487.3444	1575999.6249
62	614156.5210	1568701.1170	4227.09	SW 30	613982.2602	1568256.0137
63	575518.1130	1586543.7100	4038.20	BRYCE AZ MK	575354.8155	1586093.5441
64	576512.9440	1582067.6800	4357.70	BRYCE	576349.3642	1581618.7841
65	633185.2600	1566510.7280	4417.64	HORN	633005.6000	1566066.2462
66	580320.9040	1585783.2080	4128.59	NICK 2	580156.2437	1585333.2579
67	682452.1790	1628714.1810	3957.10	EC-30-2	682258.5400	1628252.0496
68	698323.2620	1606321.3780	3914.70	CHAS	698125.1198	1605865.6004
69	698212.0050	1609477.2870	3928.40	CHUCK	698013.8943	1609020.6139
70	682531.9020	1628747.5310	3965.57	EC-30	682338.2404	1628285.3902
71	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
100	684194.1900	1611160.8710	3912.56	USTC-518-NG	684000.0567	1610703.7202
101	684194.8810	1611165.7430	3912.33	USTC-518-NG	684000.7475	1610708.5908
102	684188.7970	1611168.5190	3912.27	USTC-518-NG	683994.6653	1610711.3660
103	684189.4230	1611176.5450	3912.53	USTC-518-NG	683995.2911	1610719.3898
104	684179.6480	1611178.5150	3912.57	USTC-518-NG	683985.5189	1610721.3592
105	684178.1630	1611171.1680	3912.37	USTC-518-NG	683984.0343	1610714.0143
106	684177.1790	1611163.0630	3913.00	USTC-518-NG	683983.0506	1610705.9116
107	684157.6940	1611173.6700	3912.42	USTC-518-STATION-5	683963.5711	1610716.5156
108	684176.2170	1611179.5100	3912.28	USTC-518-STATION-4	683982.0888	1610722.3539
109	684175.8730	1611172.3430	3912.51	USTC-518-STATION-2	683981.7449	1610715.1890
110	684173.8830	1611163.3430	3912.65	USTC-518-STATION-3	683979.7555	1610706.1915
111	684189.5770	1611170.0220	3912.30	USTC-518-STATION-1	683995.4450	1610712.8686
112	684160.3220	1611172.8640	3912.49	USTC-518-POTHOLE-1	683966.1984	1610715.7098
113	684125.1520	1611185.2360	3910.93	USTC-518-MW-1	683931.0383	1610728.0783
114	684130.9190	1611216.0540	3911.17	USTC-518-MW-2	683936.8037	1610758.8876
115	684158.8770	1611187.1610	3912.34	USTC-518-BLDGCORN-70	683964.7538	1610730.0028
116	684163.9700	1611180.4420	3912.46	USTC-518-BLDGCORN-70	683969.8453	1610723.2857
117	684211.6690	1611174.1790	3912.47	USTC-518-BLDGCORN-70	684017.5308	1610717.0244
118	684218.3800	1611179.3060	3912.45	USTC-518-BLDGCORN-70	684024.2399	1610722.1500
119	684236.0190	1611144.8000	3911.88	USTC-518-NAIL	684041.8739	1610687.6538
120	684242.7800	1611133.9130	3911.77	USTC-518-NAIL	684048.6330	1610676.7699
121	684203.7200	1611162.6570	3912.21	USTC-518-STATION-6	684009.5840	1610705.5057

SURVEYOR'S CERTIFICATION

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SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7924
PROFESSIONAL SURVEYOR

Appendix G
Laboratory Analytical Data and Data Validation Checklists

Note: The data validation checklists and laboratory analytical data reports are provided as separate files.

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-072

Appendix H
Waste Manifests

HAFB-001

Generator's Name	Generator's Address	Generator's Telephone No.
USAF	550 TABOSA AVE Holloman AFB NM 88330	575-491-8262

Origin of Special Waste (Project or Spill Location): ~~White Sands National Monument Park – Storage Lagoons~~ Holloman AFB NM Bldg # 55

Transporter #1 Company Name	Address	Telephone No.
Southwest Disposal	1350 LaVelle Road	575-434-1109
Transporter #2 Company Name	Address	Telephone No.
	Alamogordo, NM 88310	

Destination Facility Name/Site Address	Facility ID (Permit) Number	Telephone No.
Otero/Greentree Regional Landfill 24 Mls South of Alamogordo, Hwy 54	SWM-109102	575-439-4355

Type and Proper Name of Special Waste	Container(s) No.	Container(s) Type	Total Quantity	Unit Wt/Vol	
Non RCRA/Non Hazardous Substance ~~(Treatment Plant Lagoon Sludge)~~ (soil)		SD		6.95	Tons

Additional Descriptions for Special Waste Listed Above:

Site Contact: Todd Hiltunen 307-214-6080

Special Handling Instructions:

Southwest Disposal - Lined and Covered Roll-off

GENERATOR'S CERTIFICATION I hereby certify that the contents of this shipment are fully and accurately described above by type and proper name of the special waste, and that such waste has been managed, packaged, containerized and labeled in accordance with the requirements of 20.9.8 NMAC (Special Waste Requirements) in addition to any other applicable federal, state or local regulations.

Truck # 553 Bin #

Printed/Typed Name:	Signature:	Date:
Todd Hiltunen for Brent Hunt (CES)	for Brent Hunt (CES)	9/25/12

Transporter 1 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:
David Gurnbach		9/26/12

Transporter 2 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:

Discrepancy Indication Space:

Analytical supplied to landfill

no facility ID number

Facility Owner or Operator: ***I hereby acknowledge receipt of the special waste as indicated upon this manifest, except as noted above in the Discrepancy Indication Space.***

Printed/Typed Name:	Signature:	Date:
Darrell McGinnis / Attendant		9-26-12

~~Facility~~

OTERO/GREENTREE
REGIONAL LANDFILL

TRANSACTION: 28,080

CO. NAME:

ADDRESS: Environmental Waste Solutions
1348 B. Redtail Hawk Drive

CITY & STATE: Boardman, OH 44512

DATE: 9/26/12 TIME: 9:07 am

TRUCK NO.: 198

GROSS WEIGHT 47000

TARE WEIGHT: 33100

NET TONS: 13900 6.95

COST $: [redacted]

5% TAX $:

TOTAL DUE $:

WASTE: 5

WASTE DESC.: Construction Debris
H.A.F.B.

WASTE ORIGIN:

DRIVER

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-072

Appendix I
Geochemical Evaluation

Appendix I
Geochemical Evaluation of Arsenic in Soil at Building 1196 (OT-C535), Holloman Air Force Base

This appendix provides the methodology and results of a geochemical evaluation of arsenic concentrations in soil samples from Building 1196 (Septic Tank OT-C535), Holloman Air Force Base (AFB). The nine soil samples considered in this evaluation ("site" samples) were obtained on June 28, 2012 at several depth intervals ranging from 3.0 to 5.0 feet (ft) to 14.0 to 16.0 ft below ground surface (bgs). All of the samples were analyzed for the full suite of 23 Target Analyte List metals. Arsenic is evaluated here because the New Mexico Environment Department (NMED) residential soil screening level (SSL) of 3.9 milligrams per kilogram (mg/kg) for arsenic was exceeded in one sample (OTC535-IS-0004) which had a concentration of 10.3 mg/kg.

Analyses of 42 background subsurface samples were used for comparison in the evaluation. These background samples were obtained from depths of 7.0 to 30.0 ft bgs at intervals that were above the water table. Descriptions of the background samples can be found in Nation View-Bhate (2009). Note that arsenic concentrations in the 42 subsurface background samples range from non-detect (<0.79 mg/kg) to 5.8 mg/kg.

Evaluation Methodology

Trace element distributions in soil are often right-skewed and can span a wide range of concentrations. Trace element concentrations can naturally exceed risk-based screening levels because these screening levels do not consider natural site-specific distributions of trace element concentrations.

Comparisons of concentrations in site samples to background screening values can also be problematic. The background screening values used here are based on the 95th upper tolerance limits of background distributions. By definition, one would expect that five percent, or one in 20 samples will on average exceed the background screening value even if no contamination is present.

Comparisons to risk-based screening levels and background screening values only consider the absolute concentrations of individual elements, and disregard the interdependence of element concentrations and the geochemical mechanisms controlling element behavior. However, it is well established that trace elements naturally associate

with specific minerals in soil and sediment, and the preferential enrichment of a sample with these minerals will result in naturally elevated trace element concentrations. It is thus important to be able to identify these naturally high concentrations and distinguish them from potential contamination.

Recent publications indicate that geochemical evaluations are assuming a larger role in environmental investigations (e.g., EPA, 1995; Barclift, *et al*., 2000; U.S. Navy, 2002, 2003; Myers and Thorbjornsen, 2004; Thorbjornsen and Myers, 2007a, 2007b, 2008). A properly executed geochemical evaluation can distinguish between naturally high element concentrations versus contamination, and can identify the specific samples that may contain some component of site-related contamination.

Geochemical Evaluation Methodology for Soil. Trace elements naturally associate with specific soil-forming minerals, and geochemical evaluations are predicated on these known associations. For example, in most uncontaminated oxic soils, arsenic exhibits an association with iron oxide minerals. Arsenic exists in oxic soil pore fluid as oxyanions such as $HAsO_4^{-2}$ and $H_2AsO_4^{-}$ (Brookins, 1988), and these negatively charged species have a strong affinity to adsorb on iron oxides, which tend to maintain a net positive surface charge (Electric Power Research Institute, 1984). (In this report, the term "iron oxide" encompasses oxides, hydroxides, oxyhydroxides, and hydrous oxides of iron.) This association is expressed as a positive correlation between arsenic concentrations and iron concentrations for uncontaminated samples.

As a result of these associations, soil samples with a low percentage of iron oxides will contain proportionally lower arsenic concentrations, and soil samples that are enriched in iron oxides will contain proportionally higher arsenic concentrations (Bowell, 1994). Although there is variability in the absolute concentrations of arsenic and iron in soil at a site, the arsenic/iron (As/Fe) ratios of the samples will be relatively constant if no contamination is present (Myers and Thorbjornsen, 2004). Samples that contain excess arsenic from a contaminant source (herbicides, treated wood, etc.) will exhibit anomalously high As/Fe ratios compared to the uncontaminated samples.

The reference elements against which trace elements are evaluated reflect the affinities that the trace elements have for specific minerals, which is a function of the specific geochemical environment. The concentrations of iron and aluminum serve as qualitative indicators of the amounts of iron oxide and clay minerals that are present in the soil

samples (all clay minerals contain aluminum as a major component). Along with arsenic, selenium and vanadium are present in oxic soil pore fluid as anions and have an affinity to adsorb on iron oxides, which tend to maintain a net positive surface charge. Concentrations of arsenic, selenium, or vanadium in a set of samples can be evaluated through comparison to the corresponding iron concentrations. Barium, cobalt, cadmium, lead, and zinc are typically present in soil as divalent cations and have an affinity to adsorb on clay minerals, which tend to maintain a net negative surface charge. Concentrations of these elements can be evaluated through comparison to the corresponding aluminum concentrations.

To perform the geochemical evaluation, correlation plots are constructed to explore the elemental associations and identify potentially contaminated samples. The detected concentrations of the trace element of interest (dependent variable) are plotted against the detected concentrations of the reference element (independent variable), which represents the mineral to which the trace element may be adsorbed. In the case of arsenic, the arsenic concentrations for a given set of samples would be plotted on the y-axis and the corresponding iron concentrations would be plotted on the x-axis.

If no contamination is present, then the samples will exhibit a common trend with a positive slope, and the samples with the highest trace element concentrations will fall on this trend. This indicates that the elevated trace element concentrations are due to the preferential enrichment of the minerals represented by the reference element concentrations in those samples, and that the trace element has a natural source. If, however, the samples with high trace element concentrations have low or moderate reference element concentrations, then those samples will lie above the trend established by the other samples. This indicates that the anomalous samples contain excess trace elements beyond that which can be explained by the natural reference element content, and such samples may contain a component of contamination.

Site samples with a trace element present as a contaminant will exhibit anomalously high trace-versus-major element ratios compared to background trace-versus-major element ratios. These elevated ratios may not always be apparent in log-log correlation plots, especially at the upper end of the concentration range. Therefore, ratio plots—which depict trace element concentrations on the y-axis and trace/reference element ratios on the x-axis—are employed in conjunction with correlation plots in those cases where it is not immediately apparent which site samples have anomalously high elemental ratios on

the correlation plots. Ratio plots have high resolution over the entire concentration range and permit easy visual identification of samples with anomalously high elemental ratios relative to background.

It is important to note that there is natural variability, as well as analytical uncertainty, in the element ratios of uncontaminated soil samples. Trace/reference element ratios are calculated from two uncertain analytical results, so the resulting uncertainties in the ratios can produce some scatter in the points on a ratio plot. This is especially true when estimated ("J"-qualified) analytical results are used. This can be seen on some of the plots that show more scatter of the points at the lower end of the concentration range, where analytical uncertainties are higher and analytical results are reported with fewer significant figures.

Evaluation Results

Aluminum and iron are evaluated first to verify that the iron concentrations are natural and that they are therefore suitable for use as reference elements for the evaluation of arsenic.

Aluminum and Iron – Aluminum has a mean concentration of 8,500 mg/kg in the nine site samples, and has a considerable range from 1,770 to 21,700 mg/kg. Aluminum is a primary component of common soil-forming minerals such as clays, feldspars, and micas. Aluminum is always trivalent (as Al^{3+}) and can substitute for ferric iron (Fe^{3+}) in iron oxide minerals. It can also adsorb on iron oxide surfaces (Cornell and Schwertmann, 2003).

Iron has a similar mean concentration of 8,200 mg/kg in the site samples and a similar range of 1,410 to 21,800 mg/kg. It is dominantly present as iron oxides. Iron oxides are common soil-forming minerals and occur as discrete mineral grains or as coatings on silicate minerals (Cornell and Schwertmann, 2003).

Clays and iron oxides tend to exist as very fine particles, so both aluminum (a proxy for clay content) and iron (a proxy for iron oxide content) are enriched in samples with finer grain sizes. A plot of iron versus aluminum concentrations can be used to qualitatively assess the relative abundance of these minerals in site soil, as shown in Figure 1. The nine site samples are represented by circles, and the 42 subsurface background soil samples are represented by triangles in the figure. The site and background samples fall on the

same trend in the plot, indicating that all of the samples have similar iron/aluminum (Fe/Al) ratios.

These Fe/Al ratios can be seen more clearly on Figure 2, which shows iron concentrations versus Fe/Al ratios for each sample. The fact that the site and background samples have ratios that fall well within one order of magnitude indicates that the site samples do not contain excess aluminum or iron from a contaminant source and that their aluminum and iron concentrations are natural.

Iron is used as the reference element for arsenic so these results also indicate that the observed iron concentrations are suitable for use in evaluating the source(s) of arsenic in the site samples. As discussed previously, clays and iron oxides have an affinity to adsorb specific trace elements, so samples that are enriched in these minerals are expected to contain naturally high concentrations of trace elements, including arsenic. These are the samples that lie on the upper end of the trend in Figure 1.

Arsenic – Arsenic is known to associate with iron oxide minerals as discussed above. A soil sample that is naturally enriched in iron oxides is expected to be naturally enriched in arsenic. Figure 3 provides a plot of detected arsenic versus iron concentrations in the site and background samples. The site and background samples fall on the same trend, although this trend is less correlated than the iron versus aluminum trend shown in Figure 1. Eight of the nine site samples have estimated ("J"-flagged) arsenic results that are below their reporting limits (RL). Estimated results usually show less correlation on the plots because the true locations of the points are uncertain. Figure 1 also shows that the sample with the highest arsenic concentration also has the highest iron concentration, so elevated arsenic is expected in this sample.

Figure 4 provides a ratio plot of the same arsenic and iron results. This perspective reveals that the site samples have As/Fe ratios that fall within the range of the background ratios, including the sample with the highest arsenic concentration. There is more spread in the ratios at lower arsenic concentrations, which is likely due to the estimated nature of the analytical results at lower concentrations. However, the consistent As/Fe ratios in the site samples and the agreement between the site and background ratios indicate that the observed arsenic concentrations are most likely natural. Iron concentrations in the background samples range from 470 to 20,000 mg/kg, whereas the

site sample with the maximum arsenic has an iron concentration of 21,800. The natural enrichment of iron in this site sample is the probable reason for the elevated arsenic.

References

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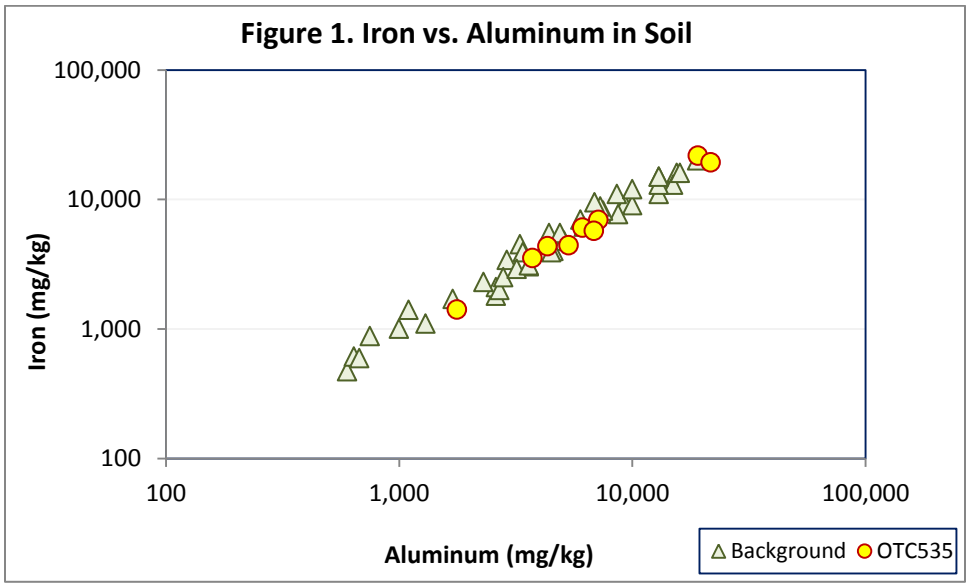
Figure 1. Iron vs. Aluminum in Soil
100,000
10,000
1,000
100
Iron (mg/kg)
100
1,000
10,000
100,000
Aluminum (mg/kg)
Background
OTC535

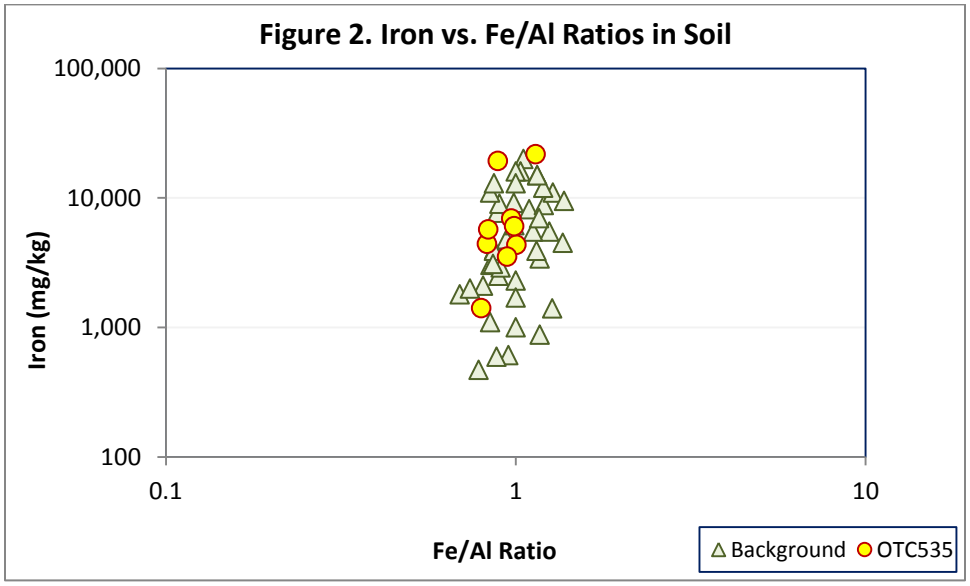
Figure 2. Iron vs. Fe/Al Ratios in Soil
100,000
10,000
1,000
100
Iron (mg/kg)
0.1
1
10
Fe/Al Ratio
Background
OTC535

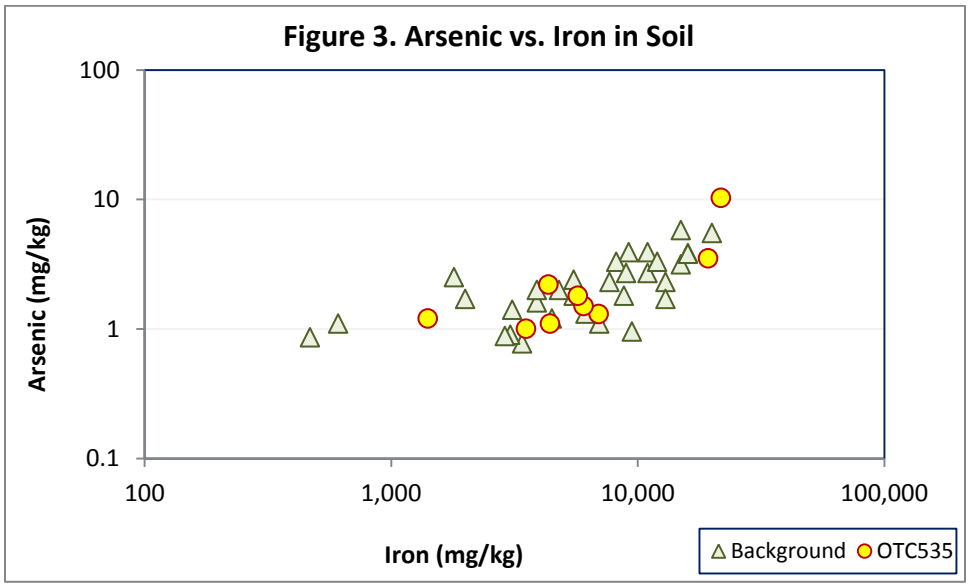
Figure 3. Arsenic vs. Iron in Soil
100
10
1
0.1
Arsenic (mg/kg)
100
1,000
10,000
100,000
Iron (mg/kg)
Background
OTC535

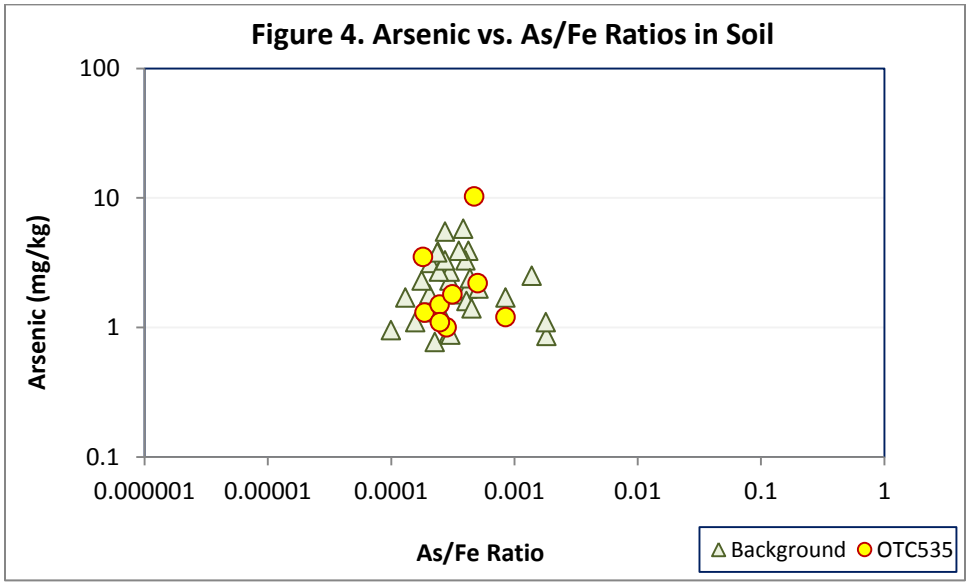
Figure 4. Arsenic vs. As/Fe Ratios in Soil
100
10
1
0.1
Arsenic (mg/kg)
0.000001
0.00001
0.0001
0.001
0.01
0.1
1
As/Fe Ratio
Background
OTC535

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-072

Appendix J
Risk Evaluation Calculations

Risk Additivity
Soil Analytical Data
Building 1196 (OT-C535) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC535-IS-0001-062812		OTC535-IS-0002-062812		OTC535-IS-0003-062812		OTC535-IS-0004-062812		OTC535-IS-0005-062812		OTC535-IS-0006-062812		OTC535-IS-0007-062812		OTC535-IS-0008-062812-FD		OTC535-IS-0009-062812	
				Sample Date	6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**85.9**		**84.9**		**88**		**88.5**		**88.4**		**88.9**		**83.8**		**84.9**		**85.6**	
VOLATILES (mg/kg)																						
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0014	U	0.0012	U	0.0011	U	0.00089	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0019	U	0.0012	U	0.0012	U	0.0013	U	0.0011	U	0.0015	U	0.0013	U	0.0012	U	0.00097	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0026	U	0.0018	U	0.0017	U	0.0019	U	0.0016	U	0.0021	U	0.0019	U	0.0017	U	0.0014	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0014	U	0.0012	U	0.0011	U	0.00089	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0014	U	0.0012	U	0.0011	U	0.00089	U
1,1-DICHLOROETHENE	NE	240	449		0.0022	U	0.0014	U	0.0014	U	0.0015	U	0.0013	U	0.0017	U	0.0015	U	0.0014	U	0.0011	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0019	U	0.0012	U	0.0012	U	0.0013	U	0.0011	U	0.0015	U	0.0013	U	0.0012	U	0.00097	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0036	U	0.0024	U	0.0023	U	0.0025	U	0.0021	U	0.0028	U	0.0025	U	0.0023	U	0.0019	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.0015	U	0.001	U	0.001	U	0.0011	U	0.00092	U	0.0012	U	0.0011	U	0.00098	U	0.00081	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0014	U	0.0012	U	0.0011	U	0.00089	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.0015	U	0.001	U	0.001	U	0.0011	U	0.00092	U	0.0012	U	0.0011	U	0.00098	U	0.00081	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0019	U	0.0012	U	0.0012	U	0.0013	U	0.0011	U	0.0015	U	0.0013	U	0.0012	U	0.00097	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0019	U	0.0012	U	0.0012	U	0.0013	U	0.0011	U	0.0015	U	0.0013	U	0.0012	U	0.00097	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0014	U	0.0012	U	0.0011	U	0.00089	U
2-HEXANONE	NE	210	NE		0.0084	U	0.0056	U	0.0055	U	0.0059	U	0.005	U	0.0066	U	0.0059	U	0.0053	U	0.0044	U
ACETONE	NE	61000	66600		0.031	U	0.021	U	0.02	U	0.022	U	0.018	U	**1.81**	J	0.022	U	0.02	U	**0.0706**	
BENZENE	NE	1.1	15.4		0.0023	U	0.0016	U	0.0015	U	0.0016	U	0.0014	U	0.0018	U	0.0017	U	0.0015	U	0.0012	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0014	U	0.0012	U	0.0011	U	0.00089	U
BROMOFORM	NE	62	616		0.0023	U	0.0016	U	0.0015	U	0.0016	U	0.0014	U	0.0018	U	0.0017	U	0.0015	U	0.0012	U
BROMOMETHANE	NE	7.3	16.5		0.0031	U	0.0021	U	0.002	U	0.0022	U	0.0018	U	0.0025	U	0.0022	U	0.002	U	0.0016	U
CARBON DISULFIDE	NE	820	1530		0.0031	U	0.0021	U	0.002	U	0.0022	U	0.0018	U	0.0025	U	0.0022	U	0.002	U	0.0016	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0028	U	0.0019	U	0.0018	U	0.002	U	0.0017	U	0.0022	U	0.002	U	0.0018	U	0.0015	U
CHLOROBENZENE	NE	290	376		0.0015	U	0.001	U	0.001	U	0.0011	U	0.00092	U	0.0012	U	0.0011	U	0.00098	U	0.00081	U
CHLOROETHANE	NE	15000	29800		0.0031	U	0.0021	U	0.002	U	0.0022	U	0.0018	U	0.0025	U	0.0022	U	0.002	U	0.0016	U
CHLOROFORM	NE	0.29	5.86		0.0019	U	0.0012	U	0.0012	U	0.0013	U	0.0011	U	0.0015	U	0.0013	U	0.0012	U	0.00097	U
CHLOROMETHANE	NE	120	275		0.0031	U	0.0021	U	0.002	U	0.0022	U	0.0018	U	0.0025	U	0.0022	U	0.002	U	0.0016	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0023	U	0.0016	U	0.0015	U	0.0016	U	0.0014	U	0.0018	U	0.0017	U	0.0015	U	0.0012	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0015	U	0.001	U	0.001	U	0.0011	U	0.00092	U	0.0012	U	0.0011	U	0.00098	U	0.00081	U
CYCLOHEXANE	NE	7000	NE		0.0022	U	0.0014	U	0.0014	U	0.0015	U	0.0013	U	0.0017	U	0.0015	U	0.0014	U	0.0011	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.0015	U	0.001	U	0.001	U	0.0011	U	0.00092	U	0.0012	U	0.0011	U	0.00098	U	0.00081	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0023	U	0.0016	U	0.0015	U	0.0016	U	0.0014	U	0.0018	U	0.0017	U	0.0015	U	0.0012	U
ETHYLBENZENE	NE	5.4	68.4		0.0015	U	0.001	U	0.001	U	0.0011	U	0.00092	U	**0.022**		0.0011	U	0.00098	U	**0.0021**	J
ISOPROPYLBENZENE	NE	2100	2430		0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0014	U	0.0012	U	0.0011	U	0.00089	U
METHYL ACETATE	NE	78000	78200		0.019	U	0.013	U	0.013	U	0.014	U	0.011	U	0.015	U	0.014	U	0.012	U	0.01	U
METHYL ETHYL KETONE	NE	28000	37100		0.0094	U	0.0063	U	0.0062	U	0.0067	U	0.0056	U	**0.0119**	J	0.0067	U	0.006	U	0.0049	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0085	U	0.0057	U	0.0056	U	0.006	U	0.0051	U	0.0068	U	0.0061	U	0.0054	U	0.0045	U
METHYLCYCLOHEXANE	NE	5630	5630		0.002	U	0.0013	U	0.0013	U	0.0014	U	0.0012	U	0.0016	U	0.0014	U	0.0013	U	0.0011	U
METHYLENE CHLORIDE	NE	56	409		0.0071	U	0.0048	U	0.0047	U	0.0051	U	0.0042	U	0.0056	U	0.0051	U	0.0045	U	0.0037	U

Risk Additivity
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				Sample Date	6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																						
STYRENE	NE	6300	7280		0.004	U	0.0027	U	0.0026	U	0.0029	U	0.0024	U	0.0032	U	0.0029	U	0.0025	U	0.0021	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0031	U	0.0021	U	0.002	U	0.0022	U	0.0018	U	0.0025	U	0.0022	U	0.002	U	0.0016	U
TETRACHLOROETHYLENE	NE	22	7.02		0.0015	U	0.001	U	0.001	U	0.0011	U	0.00092	U	0.0012	U	0.0011	U	0.00098	U	0.00081	U
TOLUENE	NE	5000	5270		0.0019	U	0.0012	U	0.0012	U	0.0013	U	0.0011	U	**0.0067**		0.0013	U	0.0012	U	**0.0014**	J
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0023	U	0.0016	U	0.0015	U	0.0016	U	0.0014	U	0.0018	U	0.0017	U	0.0015	U	0.0012	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0014	U	0.0012	U	0.0011	U	0.00089	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0019	U	0.0012	U	0.0012	U	0.0013	U	0.0011	U	0.0015	U	0.0013	U	0.0012	U	0.00097	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0031	U	0.0021	U	0.002	U	0.0022	U	0.0018	U	0.0025	U	0.0022	U	0.002	U	0.0016	U
VINYL CHLORIDE	NE	0.06	0.728		0.0023	U	0.0016	U	0.0015	U	0.0016	U	0.0014	U	0.0018	U	0.0017	U	0.0015	U	0.0012	U
XYLENES, TOTAL	NE	630	814		0.005	U	0.0033	U	0.0032	U	0.0035	U	0.0029	U	**0.132**		0.0035	U	0.0031	U	**0.0099**	J
SEMIVOLATILES (mg/kg)																						
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
2,4-DICHLOROPHENOL	NE	180	183		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.024	U	0.024	U	0.024	U	0.024	U	0.023	U	0.023	U	0.025	U	0.024	U	0.024	U
2,4-DINITROPHENOL	NE	120	122		0.39	U	0.39	U	0.38	U	0.38	U	0.37	U	0.37	U	0.4	U	0.39	U	0.39	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
2,6-DINITROTOLUENE	NE	61	61.1		0.023	U	0.023	U	0.022	U	0.022	U	0.022	U	0.022	U	0.023	U	0.023	U	0.023	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U
2-CHLOROPHENOL	NE	390	391		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
2-METHYLNAPHTHALENE	NE	230	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
2-METHYLPHENOL	NE	3100	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
2-NITROANILINE	NE	610	NE		0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U
2-NITROPHENOL	NE	NE	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U
3-NITROANILINE	NE	NE	NE		0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.078	U	0.078	U	0.076	U	0.075	U	0.074	U	0.074	U	0.079	U	0.077	U	0.077	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
4-CHLOROANILINE	NE	2.4	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
4-NITROANILINE	NE	24	NE		0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U
4-NITROPHENOL	NE	NE	NE		0.16	U	0.16	U	0.15	U	0.15	U	0.15	U	0.15	U	0.16	U	0.15	U	0.15	U
ACENAPHTHENE	NE	3400	3440		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
ACENAPHTHYLENE	NE	NE	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
ACETOPHENONE	NE	7800	7820		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
ANTHRACENE	NE	17000	17200		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U
ATRAZINE	NE	2.1	NE		0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U

Risk Additivity
Soil Analytical Data
Building 1196 (OT-C535) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC535-IS-0001-062812		OTC535-IS-0002-062812		OTC535-IS-0003-062812		OTC535-IS-0004-062812		OTC535-IS-0005-062812		OTC535-IS-0006-062812		OTC535-IS-0007-062812		OTC535-IS-0008-062812-FD		OTC535-IS-0009-062812	
				Sample Date		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012	
				Location		Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)		3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																							
BENZALDEHYDE	NE	7800	NE	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U	0.18	U	0.2	U	0.19	U	0.19	U	0.19	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	**0.0631**	J	0.02	U	0.019	U	0.019	U	0.019	U
BENZO(A)PYRENE	NE	0.015	0.148	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	**0.0493**	J	0.02	U	0.019	U	0.019	U	0.019	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	**0.0452**	J	0.02	U	0.019	U	0.019	U	0.019	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	**0.0288**	J	0.02	U	0.019	U	0.019	U	0.019	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	**0.0437**	J	0.02	U	0.019	U	0.019	U	0.019	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U	0.039	U
BIPHENYL	NE	51	57.1	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U	0.019	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U	0.019	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U	0.019	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.078	U	0.078	U	0.076	U	0.075	U	0.074	U	0.074	U	0.079	U	0.077	U	0.077	U	0.077	U
CAPROLACTAM	NE	31000	NE	0.062	U	0.062	U	0.06	U	0.06	U	0.059	U	0.059	U	0.063	U	0.062	U	0.062	U	0.062	U
CARBAZOLE	NE	NE	NE	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U	0.019	U
CHRYSENE	NE	15	148	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	**0.0618**	J	0.02	U	0.019	U	0.019	U	0.019	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U	0.019	U
DIBENZOFURAN	NE	78	NE	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U	0.019	U
DIETHYL PHTHALATE	NE	49000	48900	0.078	U	0.078	U	0.076	U	0.075	U	0.074	U	0.074	U	0.079	U	0.077	U	0.077	U	0.077	U
DIMETHYL PHTHALATE	NE	611000	611000	0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U	0.039	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.078	U	0.078	U	0.076	U	0.075	U	0.074	U	0.074	U	0.079	U	0.077	U	0.077	U	0.077	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U	0.039	U
FLUORANTHENE	NE	2300	2290	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	**0.0758**	J	0.02	U	0.019	U	0.019	U	0.019	U
FLUORENE	NE	2300	2290	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U	0.019	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U	0.019	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U	0.039	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.085	U	0.086	U	0.083	U	0.083	U	0.082	U	0.081	U	0.087	U	0.085	U	0.085	U	0.085	U
HEXACHLOROETHANE	NE	12	42.8	0.039	U	0.039	U	0.038	U	0.038	U	0.037	U	0.037	U	0.04	U	0.039	U	0.039	U	0.039	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	**0.0335**	J	0.02	U	0.019	U	0.019	U	0.019	U
ISOPHORONE	NE	510	5120	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U	0.019	U
M,P-CRESOL	NE	NE	NE	0.028	U	0.028	U	0.027	U	0.027	U	0.027	U	0.027	U	0.029	U	0.028	U	0.028	U	0.028	U
NAPHTHALENE	NE	3.6	43.0	0.031	U	0.031	U	0.03	U	0.03	U	0.03	U	0.029	U	0.032	U	0.031	U	0.031	U	0.031	U
NITROBENZENE	NE	4.8	53.5	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U	0.019	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U	0.019	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U	0.019	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.23	U	0.23	U	0.23	U	0.23	U	0.22	U	0.22	U	0.24	U	0.23	U	0.23	U	0.23	U
PHENANTHRENE	NE	1830	1830	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U	0.019	U
PHENOL	NE	18000	18300	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	0.018	U	0.02	U	0.019	U	0.019	U	0.019	U
PYRENE	NE	1700	1720	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U	**0.0694**	J	0.02	U	0.019	U	0.019	U	0.019	U

Risk Additivity
Soil Analytical Data
Building 1196 (OT-C535) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC535-IS-0001-062812		OTC535-IS-0002-062812		OTC535-IS-0003-062812		OTC535-IS-0004-062812		OTC535-IS-0005-062812		OTC535-IS-0006-062812		OTC535-IS-0007-062812		OTC535-IS-0008-062812-FD		OTC535-IS-0009-062812	
				Sample Date		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012	
				Location		Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)		3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																							
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U		
1,3-DINITROBENZENE	NE	6.10	NE	0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U		
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U		
2,4-DINITROTOLUENE	NE	1.60	15.7	0.081	U	0.084	U	0.092	U	0.089	U	0.072	U	0.097	U	0.079	U	0.097	U	0.089	U		
2,6-DINITROTOLUENE	NE	61.0	61.1	0.072	U	0.075	U	0.083	U	0.08	U	0.064	U	0.087	U	0.07	U	0.087	U	0.08	U		
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U		
2-NITROTOLUENE	NE	2.90	29.1	0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U		
3-NITROTOLUENE	NE	6.10	7.82	0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U		
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U		
4-NITROTOLUENE	NE	30.0	244.4	0.084	U	0.087	U	0.096	U	0.093	U	0.075	U	0.1	U	0.082	U	0.1	U	0.093	U		
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U		
NITROBENZENE	NE	4.80	53.5	0.077	U	0.08	U	0.089	U	0.085	U	0.069	U	0.093	U	0.075	U	0.093	U	0.085	U		
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U		
TETRYL	NE	240.0	244.0	0.067	U	0.069	U	0.076	U	0.073	U	0.059	U	0.08	U	0.065	U	0.08	U	0.073	U		
METALS (mg/kg)																							
ALUMINUM	13722	77000	78000	**1770**		**7150**		**4330**		**19100**		**6110**		**3730**		**5340**		**6850**		**21700**			
ANTIMONY	1.6	31	31.3	0.98	U	1.5	U	0.95	U	0.97	U	0.98	U	1.5	U	0.99	U	1.5	U	0.92	U		
ARSENIC	3.7	0.39	3.90	**1.2**	J	**1.3**	J	**2.2**	J	**10.3**		**1.5**	J	**1**	J	**1.1**	J	**1.8**	J	**3.5**	J		
BARIUM	169.3	15000	15600	**36.3**	J	**57.2**	J	**52.4**	J	**117**		**54.9**	J	**39.6**	J	**43.2**	J	**57.5**	J	**178**			
BERYLLIUM	1.6	160	156	0.49	U	0.38	U	0.48	U	**1.3**	J	0.49	U	0.37	U	0.49	U	0.37	U	**1.3**	J		
CADMIUM	0.3	70	70.3	0.49	U	0.76	U	0.48	U	0.48	U	0.49	U	0.75	U	0.49	U	0.74	U	0.46	U		
CALCIUM	317332	NE	NE	**255000**		**229000**		**219000**		**53100**		**217000**		**285000**		**211000**		**220000**		**139000**			
CHROMIUM[d]	25	117000	117000	**1.5**	J	**7.5**	J	**4.7**	J	**20.2**		**6**		**5.4**	J	**5.7**		**7.1**	J	**24**			
COBALT	7.7	23	NE	**0.89**	J	**4.8**	J	**1.6**	J	**11.9**	J	**2.3**	J	**1.5**	J	**1.9**	J	**2.3**	J	**7.9**	J		
COPPER	13	3100	3130	**2.9**	J	**4.4**	J	**3.4**	J	**12.7**		**5.4**	J	**4.2**	J	**3.1**	J	**3.8**	J	**11.8**			
IRON	23049	55000	54800	**1410**		**6950**		**4350**		**21800**		**6050**		**3530**		**4420**		**5720**		**19300**			
LEAD	10.9	400	400	**1.9**	J	**2.8**	J	**3.3**	J	**11.6**		**5.6**	J	**5.9**	J	**3.2**	J	**2.4**	J	**13**			
MAGNESIUM	16991	NE	NE	**2750**		**5230**		**3380**		**10300**		**7400**		**4570**		**4730**		**5960**		**12300**			
MANGANESE	393	1800	1860	**25.3**		**224**		**147**		**464**		**138**		**86.6**		**79.1**		**112**		**253**			
MERCURY	0.0108	10	15.6	0.0095	U	0.0095	U	0.009	U	0.0093	U	0.0091	U	0.0091	U	0.0095	U	0.0097	U	0.0093	U		
NICKEL	17.4	1500	1560	**1.8**	J	**6.6**	J	**4**	J	**24**		**5.2**	J	**3.5**	J	**4.7**	J	**6.1**	J	**18.4**			
POTASSIUM	5077	NE	NE	**524**	J	**1810**	J	**1000**	J	**3690**	J	**1670**	J	**1100**	J	**1210**	J	**1580**	J	**4280**	J		
SELENIUM	1.4	390	391	2	U	3	U	1.9	U	1.9	U	2	U	**3.7**	J	2	U	2.9	U	1.8	U		
SILVER	1.1	390	391	0.49	U	0.38	U	0.48	U	0.48	U	0.49	U	0.37	U	0.49	U	0.37	U	0.46	U		
SODIUM	5196	NE	NE	540	U	420	U	530	U	530	U	**2120**	J	**443**	J	**2120**	J	**2370**	J	**5520**			
THALLIUM	1.3	0.78	0.782	1.3	U	2	U	1.2	U	1.3	U	1.3	U	1.9	U	1.3	U	1.9	U	1.2	U		
VANADIUM	42.6	390	391	**4.3**	J	**11.6**	J	**14**	J	**36.8**		**11.3**	J	**7.4**	J	**11.7**	J	**15.4**	J	**29.1**			
ZINC	54.6	23000	23500	**5**	J	**19.1**		**10.4**		**54.8**		**19.2**		**19.4**		**12.5**		**14.7**	J	**54.7**			

Risk Additivity
Soil Analytical Data
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Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC535-IS-0001-062812		OTC535-IS-0002-062812		OTC535-IS-0003-062812		OTC535-IS-0004-062812		OTC535-IS-0005-062812		OTC535-IS-0006-062812		OTC535-IS-0007-062812		OTC535-IS-0008-062812-FD		OTC535-IS-0009-062812	
				Sample Date	6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																						
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93		0.0077	UJ	0.0078	U	0.0075	U	0.0074	U	0.0075	U	0.0073	U	0.0079	U	0.0079	U	0.0077	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49		0.0096	U	0.0098	U	0.0094	U	0.0093	U	0.0093	U	0.0091	U	0.0099	U	0.0098	U	0.0096	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49		0.0096	U	0.0098	U	0.0094	U	0.0093	U	0.0093	U	0.0091	U	0.0099	U	0.0098	U	0.0096	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22		0.0077	U	0.0078	U	0.0075	U	0.0074	U	0.0075	U	0.0073	U	0.0079	U	0.0079	U	0.0077	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22		0.0077	U	0.0078	U	0.0075	U	0.0074	U	0.0075	U	0.0073	U	0.0079	U	0.0079	U	0.0077	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12		0.0077	U	0.0078	U	0.0075	U	0.0074	U	0.0075	U	0.0073	U	0.0079	U	0.0079	U	0.0077	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22		0.0077	UJ	0.0078	U	0.0075	U	0.0074	U	0.0075	U	0.0073	U	0.0079	U	0.0079	U	0.0077	U
PETROLEUM HYDROCARBONS (mg/kg)																						
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000		4.2	U	3.5	U	4.4	U	3.6	U	3	U	3.9	U	3.3	U	3.5	U	3.3	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000		3.9	U	3.9	U	3.8	U	3.7	U	3.8	U	**6.08**	J	4	U	3.9	U	3.9	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000		3.9	U	3.9	U	3.8	U	3.7	U	3.8	U	**20.2**		4	U	3.9	U	3.9	U
CYANIDE (mg/kg)																						
CYANIDE	NE	22.0	46.9		0.068	U	0.071	U	0.066	U	0.066	U	0.065	U	0.065	U	0.07	U	0.071	U	0.07	U
TRITIUM (pCi/g)																						
TRITIUM	NE	NE	NE		5.74	U	5.72	U	5.69	U	5.59	U	5.66	U	5.73	U	5.5	U	5.42	U	5.61	U

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Analyte			Sample Number	Risk Additivity Evaluation at Building 1196, Holloman AFB				
			Sample Date					
			Location					
			Depth (ft bgs)			0-10 ft bgs		
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
PERCENT SOLIDS	NE	NE	NE					
VOLATILES (mg/kg)								
1,1,1-TRICHLOROETHANE	NE	8700	15600	1,1,1-TRICHLOROETHANE		ND		
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02	1,1,2,2-TETRACHLOROETHANE		ND		
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND		
1,1,2-TRICHLOROETHANE	NE	1.1	2.81	1,1,2-TRICHLOROETHANE		ND		
1,1-DICHLOROETHANE	NE	3.3	64.5	1,1-DICHLOROETHANE		ND		
1,1-DICHLOROETHENE	NE	240	449	1,1-DICHLOROETHENE		ND		
1,2,4-TRICHLOROBENZENE	NE	22	73.0	1,2,4-TRICHLOROBENZENE		ND		
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86	1,2-DIBROMO-3-CHLOROPROPANE		ND		
1,2-DIBROMOETHANE	NE	0.034	0.588	1,2-DIBROMOETHANE		ND		
1,2-DICHLOROBENZENE	NE	1900	2310	1,2-DICHLOROBENZENE		ND		
1,2-DICHLOROETHANE	NE	0.43	7.89	1,2-DICHLOROETHANE		ND		
1,2-DICHLOROPROPANE	NE	0.94	15.2	1,2-DICHLOROPROPANE		ND		
1,3-DICHLOROBENZENE	NE	NE	NE	1,3-DICHLOROBENZENE		ND		
1,4-DICHLOROBENZENE	NE	2.4	31.7	1,4-DICHLOROBENZENE		ND		
2-HEXANONE	NE	210	NE	2-HEXANONE		ND		
ACETONE	NE	61000	66600	ACETONE		ND		
BENZENE	NE	1.1	15.4	BENZENE		ND		
BROMODICHLOROMETHANE	NE	0.27	5.41	BROMODICHLOROMETHANE		ND		
BROMOFORM	NE	62	616	BROMOFORM		ND		
BROMOMETHANE	NE	7.3	16.5	BROMOMETHANE		ND		
CARBON DISULFIDE	NE	820	1530	CARBON DISULFIDE		ND		
CARBON TETRACHLORIDE	NE	0.61	10.8	CARBON TETRACHLORIDE		ND		
CHLOROBENZENE	NE	290	376	CHLOROBENZENE		ND		
CHLOROETHANE	NE	15000	29800	CHLOROETHANE		ND		
CHLOROFORM	NE	0.29	5.86	CHLOROFORM		ND		
CHLOROMETHANE	NE	120	275	CHLOROMETHANE		ND		
CIS-1,2-DICHLOROETHYLENE	NE	160	156	CIS-1,2-DICHLOROETHYLENE		ND		
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	CIS-1,3-DICHLOROPROPENE		ND		
CYCLOHEXANE	NE	7000	NE	CYCLOHEXANE		ND		
DIBROMOCHLOROMETHANE	NE	0.68	12.1	DIBROMOCHLOROMETHANE		ND		
DICHLORODIFLUOROMETHANE	NE	94	168	DICHLORODIFLUOROMETHANE		ND		
ETHYLBENZENE	NE	5.4	68.4	ETHYLBENZENE		ND		
ISOPROPYLBENZENE	NE	2100	2430	ISOPROPYLBENZENE		ND		
METHYL ACETATE	NE	78000	78200	METHYL ACETATE		ND		
METHYL ETHYL KETONE	NE	28000	37100	METHYL ETHYL KETONE		ND		
METHYL ISOBUTYL KETONE	NE	5300	5820	METHYL ISOBUTYL KETONE		ND		
METHYLCYCLOHEXANE	NE	5630	5630	METHYLCYCLOHEXANE		ND		
METHYLENE CHLORIDE	NE	56	409	METHYLENE CHLORIDE		ND		

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			Location					
			Depth (ft bgs)			0-10 ft bgs		
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
VOLATILES - continued (mg/kg)				VOLATILES - continued (mg/kg)				
STYRENE	NE	6300	7280	STYRENE		ND		
TERT-BUTYL METHYL ETHER	NE	43	901	TERT-BUTYL METHYL ETHER		ND		
TETRACHLOROETHYLENE	NE	22	7.02	TETRACHLOROETHYLENE		ND		
TOLUENE	NE	5000	5270	TOLUENE		ND		
TRANS-1,2-DICHLOROETHENE	NE	150	270	TRANS-1,2-DICHLOROETHENE		ND		
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	TRANS-1,3-DICHLOROPROPENE		ND		
TRICHLOROETHYLENE	NE	0.91	8.77	TRICHLOROETHYLENE		ND		
TRICHLOROFLUOROMETHANE	NE	790	1410	TRICHLOROFLUOROMETHANE		ND		
VINYL CHLORIDE	NE	0.06	0.728	VINYL CHLORIDE		ND		
XYLENES, TOTAL	NE	630	814	XYLENES, TOTAL		ND		
SEMIVOLATILES (mg/kg)				SEMIVOLATILES (mg/kg)				
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	2,2'-OXYBIS(1-CHLORO)PROPANE		ND		
2,4,5-TRICHLOROPHENOL	NE	6100	6110	2,4,5-TRICHLOROPHENOL		ND		
2,4,6-TRICHLOROPHENOL	NE	44	61.1	2,4,6-TRICHLOROPHENOL		ND		
2,4-DICHLOROPHENOL	NE	180	183	2,4-DICHLOROPHENOL		ND		
2,4-DIMETHYLPHENOL	NE	1200	1220	2,4-DIMETHYLPHENOL		ND		
2,4-DINITROPHENOL	NE	120	122	2,4-DINITROPHENOL		ND		
2,4-DINITROTOLUENE	NE	1.6	15.7	2,4-DINITROTOLUENE		ND		
2,6-DINITROTOLUENE	NE	61	61.1	2,6-DINITROTOLUENE		ND		
2-CHLORONAPHTHALENE	NE	6300	6260	2-CHLORONAPHTHALENE		ND		
2-CHLOROPHENOL	NE	390	391	2-CHLOROPHENOL		ND		
2-METHYLNAPHTHALENE	NE	230	NE	2-METHYLNAPHTHALENE		ND		
2-METHYLPHENOL	NE	3100	NE	2-METHYLPHENOL		ND		
2-NITROANILINE	NE	610	NE	2-NITROANILINE		ND		
2-NITROPHENOL	NE	NE	NE	2-NITROPHENOL		ND		
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	3,3'-DICHLOROBENZIDINE		ND		
3-NITROANILINE	NE	NE	NE	3-NITROANILINE		ND		
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	4,6-DINITRO-2-METHYLPHENOL		ND		
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	4-BROMOPHENYL PHENYL ETHER		ND		
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	4-CHLORO-3-METHYLPHENOL		ND		
4-CHLOROANILINE	NE	2.4	NE	4-CHLOROANILINE		ND		
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	4-CHLOROPHENYL PHENYL ETHER		ND		
4-NITROANILINE	NE	24	NE	4-NITROANILINE		ND		
4-NITROPHENOL	NE	NE	NE	4-NITROPHENOL		ND		
ACENAPHTHENE	NE	3400	3440	ACENAPHTHENE		ND		
ACENAPHTHYLENE	NE	NE	NE	ACENAPHTHYLENE		ND		
ACETOPHENONE	NE	7800	7820	ACETOPHENONE		ND		
ANTHRACENE	NE	17000	17200	ANTHRACENE		ND		
ATRAZINE	NE	2.1	NE	ATRAZINE		ND		

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			Location					
			Depth (ft bgs)			0-10 ft bgs		
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
SEMIVOLATILES - continued (mg/kg)				SEMIVOLATILES - continued (mg/kg)				
BENZALDEHYDE	NE	7800	NE	BENZALDEHYDE		ND		
BENZO(A)ANTHRACENE	NE	0.15	1.48	BENZO(A)ANTHRACENE		ND		
BENZO(A)PYRENE	NE	0.015	0.148	BENZO(A)PYRENE		ND		
BENZO(B)FLUORANTHENE	NE	0.15	1.48	BENZO(B)FLUORANTHENE		ND		
BENZO(G,H,I)PERYLENE	NE	NE	NE	BENZO(G,H,I)PERYLENE		ND		
BENZO(K)FLUORANTHENE	NE	1.5	14.8	BENZO(K)FLUORANTHENE		ND		
BENZYL BUTYL PHTHALATE	NE	260	NE	BENZYL BUTYL PHTHALATE		ND		
BIPHENYL	NE	51	57.1	BIPHENYL		ND		
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	BIS(2-CHLOROETHOXY) METHANE		ND		
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	BIS(2-CHLOROETHYL) ETHER		ND		
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	BIS(2-ETHYLHEXYL) PHTHALATE		ND		
CAPROLACTAM	NE	31000	NE	CAPROLACTAM		ND		
CARBAZOLE	NE	NE	NE	CARBAZOLE		ND		
CHRYSENE	NE	15	148	CHRYSENE		ND		
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	DIBENZ(A,H)ANTHRACENE		ND		
DIBENZOFURAN	NE	78	NE	DIBENZOFURAN		ND		
DIETHYL PHTHALATE	NE	49000	48900	DIETHYL PHTHALATE		ND		
DIMETHYL PHTHALATE	NE	611000	611000	DIMETHYL PHTHALATE		ND		
DI-N-BUTYL PHTHALATE	NE	6100	6110	DI-N-BUTYL PHTHALATE		ND		
DI-N-OCTYLPHTHALATE	NE	730	NE	DI-N-OCTYLPHTHALATE		ND		
FLUORANTHENE	NE	2300	2290	FLUORANTHENE		ND		
FLUORENE	NE	2300	2290	FLUORENE		ND		
HEXACHLOROBENZENE	NE	0.3	3.04	HEXACHLOROBENZENE		ND		
HEXACHLOROBUTADIENE	NE	6.2	61.1	HEXACHLOROBUTADIENE		ND		
HEXACHLOROCYCLOPENTADIENE	NE	370	367	HEXACHLOROCYCLOPENTADIENE		ND		
HEXACHLOROETHANE	NE	12	42.8	HEXACHLOROETHANE		ND		
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	INDENO(1,2,3-C,D)PYRENE		ND		
ISOPHORONE	NE	510	5120	ISOPHORONE		ND		
M,P-CRESOL	NE	NE	NE	M,P-CRESOL		ND		
NAPHTHALENE	NE	3.6	43.0	NAPHTHALENE		ND		
NITROBENZENE	NE	4.8	53.5	NITROBENZENE		ND		
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	N-NITROSODI-N-PROPYLAMINE		ND		
N-NITROSODIPHENYLAMINE	NE	99	993	N-NITROSODIPHENYLAMINE		ND		
PENTACHLOROPHENOL	NE	0.89	8.94	PENTACHLOROPHENOL		ND		
PHENANTHRENE	NE	1830	1830	PHENANTHRENE		ND		
PHENOL	NE	18000	18300	PHENOL		ND		
PYRENE	NE	1700	1720	PYRENE		ND		

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			Sample Date					
			Location					
			Depth (ft bgs)			0-10 ft bgs		
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
EXPLOSIVES (mg/kg)				EXPLOSIVES (mg/kg)				
1,3,5-TRINITROBENZENE	NE	2200.0	NE	1,3,5-TRINITROBENZENE		ND		
1,3-DINITROBENZENE	NE	6.10	NE	1,3-DINITROBENZENE		ND		
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	2,4,6-TRINITROTOLUENE		ND		
2,4-DINITROTOLUENE	NE	1.60	15.7	2,4-DINITROTOLUENE		ND		
2,6-DINITROTOLUENE	NE	61.0	61.1	2,6-DINITROTOLUENE		ND		
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	2-AMINO-4,6-DINITROTOLUENE		ND		
2-NITROTOLUENE	NE	2.90	29.1	2-NITROTOLUENE		ND		
3-NITROTOLUENE	NE	6.10	7.82	3-NITROTOLUENE		ND		
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	4-AMINO-2,6-DINITROTOLUENE		ND		
4-NITROTOLUENE	NE	30.0	244.4	4-NITROTOLUENE		ND		
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE		ND		
NITROBENZENE	NE	4.80	53.5	NITROBENZENE		ND		
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE		ND		
TETRYL	NE	240.0	244.0	TETRYL		ND		
METALS (mg/kg)				METALS (mg/kg)				
ALUMINUM	13722	77000	78000	ALUMINUM		6850		
ANTIMONY	1.6	31	31.3	ANTIMONY		ND		
ARSENIC	3.7	0.39	3.90	ARSENIC	C	2.2	5.64E-06	
BARIUM	169.3	15000	15600	BARIUM	N	57.5		0.0037
BERYLLIUM	1.6	160	156	BERYLLIUM		ND		
CADMIUM	0.3	70	70.3	CADMIUM		ND		
CALCIUM	317332	NE	NE	CALCIUM	NUTRIENT	255000		
CHROMIUM[d]	25	117000	117000	CHROMIUMd	N	7.1		0.000061
COBALT	7.7	23	NE	COBALT	N	2.3		0.10 RSL
COPPER	13	3100	3130	COPPER	N	5.4		0.0017
IRON	23049	55000	54800	IRON	N	6050		0.11
LEAD	10.9	400	400	LEAD	N	5.6		0.014
MAGNESIUM	16991	NE	NE	MAGNESIUM	NUTRIENT	7400		
MANGANESE	393	1800	1860	MANGANESE	N	147		0.079
MERCURY	0.0108	10	15.6	MERCURY		ND		
NICKEL	17.4	1500	1560	NICKEL	N	6.1		0.0039
POTASSIUM	5077	NE	NE	POTASSIUM	NUTRIENT	1670		
SELENIUM	1.4	390	391	SELENIUM		ND		
SILVER	1.1	390	391	SILVER		ND		
SODIUM	5196	NE	NE	SODIUM	NUTRIENT	2370		
THALLIUM	1.3	0.78	0.782	THALLIUM		ND		
VANADIUM	42.6	390	391	VANADIUM	N	15.4		0.039
ZINC	54.6	23000	23500	ZINC	N	19.2		0.00082

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			Location					
			Depth (ft bgs)			0-10 ft bgs		
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
PCBs (mg/kg)				PCBs (mg/kg)				
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	PCB-1016 (AROCLOR 1016)		ND		
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	PCB-1221 (AROCLOR 1221)		ND		
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	PCB-1232 (AROCLOR 1232)		ND		
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	PCB-1242 (AROCLOR 1242)		ND		
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	PCB-1248 (AROCLOR 1248)		ND		
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	PCB-1254 (AROCLOR 1254)		ND		
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	PCB-1260 (AROCLOR 1260)		ND		
PETROLEUM HYDROCARBONS (mg/kg)				PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	GASOLINE RANGE ORGANICS C6-C10		ND		
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	DIESEL RANGE ORGANICS C10-C28		ND		
OIL RANGE ORGANICS C28-C40	NE	NE	1000	OIL RANGE ORGANICS C28-C40		ND		
CYANIDE (mg/kg)				CYANIDE (mg/kg)				
CYANIDE	NE	22.0	46.9	CYANIDE		ND		
TRITIUM (pCi/g)				TRITIUM (pCi/g)				
TRITIUM	NE	NE	NE	TRITIUM		ND		
				SUM:			**5.6E-06**	**0.35**

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Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-072

Appendix K
Ecological Evaluation

NEW MEXICO ENVIRONMENT DEPARTMENT
SITE ASSESSMENT CHECKLIST
(From NMED (2012) Attachment A)

I. SITE LOCATION

1. Site Name: Building 1196 (OT-C535) Inactive Septic System
   US EPA I.D. Number: NM6572124422
   Location: Tularosa Basin within Holloman Air Force Base (HAFB)
   County: Otero
   City: HAFB _____ State: NM

2. Latitude: 32º 53´ 18.443˝ N Longitude: 106º 6´ 1.255˝ W

3. Attach site maps, including a topographical map, a diagram which illustrates the layout of the facility (e.g., site boundaries, structures, etc.), and maps showing all habitat areas identified in Section III of the checklist. Also, include maps which illustrate known release areas, sampling locations, and any other important features, if available.

Note: Site maps and supporting information that include (1) a Physiographic Map, (2) a Site Layout and Sampling Location Map, and (3) a Site Photo Log are generally included for all sites in the RFI reports. A site habitat map and a Google Earth photo that shows the site habitat are attached to this Site Assessment checklist.

II. SITE CHARACTERIZATION

1. Indicate the approximate area of the site (i.e., acres or sq. ft): Approximately 3 acres

2. Provide an approximate breakdown of the land uses on the site:

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	_____% Undisturbed	100% Other[c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, etc.):
_____

[b]For agricultural areas, please list the crops and/or livestock which are present:
_____

[c]For areas designated as "other", please describe the usage of the area:
Building 1196 was constructed in 1956 and originally used for missile assembly. It was later converted to a communications equipment storage facility. The Septic Tanks Report (included as Appendix A) indicates that the building contained a toilet, urinal, and lavatory which discharged to the sewer system. There was no floor drain at Building 1196. The septic

tank was abandoned in place in January 2008 by opening the tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill (North Wind Inc., 2008).

3. Provide an approximate breakdown of the land uses in the area surrounding the site. Indicate the radius (in miles) of the area described: approximately 0.5 mile

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	80 % Undisturbed	20 % Other [c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, golf course, etc.):

---

[b]For agricultural areas, please list the crops and/or livestock which are present:

---

[c]For areas designated as "other", please describe the usage of the area:
On-site habitat has been disturbed from past site activity. The Habitat Map for Holloman AFB (attached) shows that habitat within 0.5 mile radius is mostly undisturbed and is dominated by fourwing saltbush/alkali sacaton shrubland, with limited areas of alkali sacaton grassland and fourwing saltbush/gypsum dropseed shrubland intermixed.

4. Describe reasonable and likely future land and/or water use(s) at the site.
Land use is likely to remain the same.

5. Describe the historical uses of the site. Include information on chemical releases that may have occurred as a result of previous land uses. For each chemical release, provide information on the form of the chemical released (i.e., solid, liquid, vapor) and the known or suspected causes or mechanism of the release (i.e., spills, leaks, material disposal, dumping, explosion, etc.).

Building 1196 was constructed in 1956 and originally used for missile assembly. It was later converted to a communications equipment storage facility. Building 1196 currently remains at the site, as shown in the photo log (See RFI Report). However, the septic tank was abandoned in place in January 2008 by opening the tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill (North Wind Inc., 2008). The building is likely still used for communications equipment storage.

6. If any movement of soil has taken place at the site, describe the degree of the disturbance. Indicate the likely source of any disturbances (e.g., erosion, agricultural, mining, industrial activities, removals, etc.) and estimate when these events occurred.

Site disturbances of soil have been limited to excavation activities associated with building construction and septic system installation and septic system closure activities.

7. Describe the current uses of the site. Include information on recent (previous 5 years) disturbances or chemical releases that have occurred. For each chemical release, provide information on the form of the chemical released and the causes or mechanism of the release.

Building 1196 currently remains at the site, as shown in the photo log (See RFI Report). However, the septic tank was abandoned in place in January 2008 by opening the tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill (North Wind Inc., 2008). The building is likely still used for communications equipment storage.

8. Identify the location or suspected location of chemical releases at the site. Provide an estimate of the distance between these locations and the areas identified in Section III.

Chemical releases that may have occurred are associated with septic system leakage.

9. Identify the suspected contaminants of concern (COCs) at the site. If known, include the maximum contaminant levels. Please indicate the source of data cited (e.g., RFI, confirmatory sampling, etc.).

As documented in the RFI, detected constituents from soil samples collected include several metals. Additionally, samples were analyzed for VOCs, SVOCs, explosives, PCBs, petroleum range organics (both diesel and oil range), cyanide, and tritium; however all were non-detect in soil samples from the site (for 0 to 10 feet bgs, the zone of interest for ecological receptors).

10. Identify the media (e.g., soil (surface or subsurface), surface water, air, groundwater) which are known or suspected to contain COCs. _____
Surface and subsurface soil, and potentially, groundwater

11. Indicate the approximate depth to groundwater (in feet below ground surface [(bgs)].

A water-bearing zone was not encountered during soil boring advancement. Therefore, a groundwater investigation was not conducted at Building 1196.

12. Indicate the direction of groundwater flow (e.g., north, southeast, etc.)

A water-bearing zone was not encountered during soil boring advancement. Therefore, a groundwater investigation was not conducted at Building 1196.

III. HABITAT EVALUATION

III.A Wetland Habitats

Are any wetland[1] areas such as marshes or swamps on or adjacent to the site?

☐ Yes X No

If yes, indicate the wetland area on the attached site map and answer the following questions regarding the wetland area. If more than one wetland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wetland area. Distinguish between wetland areas by using names or other designations (such as location), and clearly identify each area on the site map. Also, obtain and attach a National Wetlands Inventory Map (or maps) to illustrate each wetland area.

Identify the sources of the observations and information (e.g., National Wetland Inventory, Federal or State Agency, USGS topographic maps) used to make the determination that wetland areas are or are not present.

The Integrated Natural Resource Management Plan for Holloman AFB (HAFB, 2011) and site observations.

If no wetland areas are present, proceed to Section III.B.

1Wetlands are defined in 40 CFR §232.2 as " Areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Examples of typical wetlands plants include: cattails, cordgrass, willows and cypress trees. National wetland inventory maps may be available at http:\\nwi.fws.gov. Additional information on wetland delineation criteria is also available from the Army Corps of Engineers.

Wetland Area Questions

☐ Onsite ☐ Offsite

Name or
Designation:_____

1. Indicate the approximate area of the wetland (acres or ft^2)_____

2. Identify the type(s) of vegetation present in the wetland.

   - ❑ Submergent (i.e., underwater) vegetation
   - ❑ Emergent (i.e., rooted in the water, but rising above it) vegetation
   - ❑ Floating vegetation
   - ❑ Scrub/shrub
   - ❑ Wooded
   - ❑ Other (Please describe):_____

3. Estimate the vegetation density of the wetland area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Is standing water present? ☐ Yes ☐ No

   If yes, is the water primarily: ☐ Fresh or ☐ Brackish
   Indicate the approximate area of the standing water (ft^2): _____
   Indicate the approximate depth of the standing water, if known (ft. or in.)_____

5. If known, indicate the source of the water in the wetland.

   - ❑ Stream/River/Creek/Lake/Pond
   - ❑ Flooding
   - ❑ Groundwater
   - ❑ Surface runoff

6. Is there a discharge from the facility to the wetland? ☐ Yes ☐ No

   If yes, please
   describe:_____
   _____
   _____
   _____
   _____

Wetland Area Questions (Continued)

7. Is there a discharge from the wetland? ☐ Yes ☐ No
   If yes, indicate the type of aquatic feature the wetland discharges into:

   - ❑ Surface stream/River (Name:_____)
   - ❑ Lake/Pond (Name:_____)
   - ❑ Groundwater
   - ❑ Not sure

8. Does the area show evidence of flooding? ☐ Yes ☐ No
   If yes, indicate which of the following are present (mark all that apply):

   - ❑ Standing water
   - ❑ Water-saturated soils
   - ❑ Water marks
   - ❑ Buttressing
   - ❑ Debris lines
   - ❑ Mud cracks
   - ❑ Other (Please describe):_____

9. Animals observed in the wetland area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:
   _____
   _____
   _____
   _____

III.B Aquatic Habitats

III.B.1 Non-Flowing Aquatic Features

Are any non-flowing aquatic features (such as ponds or lakes) located at or adjacent to the site?

☐ Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the non-flowing aquatic features. If more than one non-flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.B.2.

Non-Flowing Aquatic Feature Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Indicate the type of aquatic feature present:

   - ❑ Natural (e.g., pond or lake)
   - ❑ Man-made (e.g., impoundment, lagoon, canal, etc.)

2. Estimate the approximate size of the water body (in acres or sq. ft.)_____

3. If known, indicate the depth of the water body (in ft. or in.)._____

Non-Flowing Aquatic Feature Questions (Continued)

4. Indicate the general composition of the bottom substrate. Mark all sources that apply from the following list.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

☐ Other (please specify):_____

5. Indicate the source(s) of the water in the aquatic feature. Mark all sources that apply from the following list.

- ❑ River/Stream/Creek
- ❑ Groundwater
- ❑ Industrial Discharge
- ❑ Surface Runoff
- ❑ Other (please specify):_____

6. Is there a discharge from the facility to the aquatic feature? ☐ Yes ☐ No
   If yes, describe the origin of each discharge and its migration path:
   _____
   _____
   _____
   _____

7. Does the aquatic feature discharge to the surrounding environment? ☐ Yes ☐ No
   If yes, indicate the features from the following list into which the aquatic feature discharges, and indicate whether the discharge occurs onsite or offsite:

- ❑ River/Stream/Creek ☐ onsite ☐ offsite
- ❑ Groundwater ☐ onsite ☐ offsite
- ❑ Wetland ☐ onsite ☐ offsite
- ❑ Impoundment ☐ onsite ☐ offsite
- ❑ Other (please describe)_____

Non-Flowing Aquatic Feature Questions (Continued)

8. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Fish
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, turtles)
- ❑ Amphibians (e.g., frogs, salamanders)
- ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

Specify species, if known:

_____
_____
_____
_____

III.B.2 Flowing Aquatic Features

Are any flowing aquatic features (such as streams or rivers) located at or adjacent to the site?

☐ Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the flowing aquatic features. If more than one flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map

If no, proceed to Section III.C.

Flowing Aquatic Feature Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Indicate the type of flowing aquatic feature present.

   - ❑ River
   - ❑ Stream
   - ❑ Creek
   - ❑ Brook
   - ❑ Dry wash
   - ❑ Arroyo
   - ❑ Intermittent stream
   - ❑ Artificially created (ditch, etc.)
   - ❑ Other (specify)
   - ❑

2. Indicate the general composition of the bottom substrate.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

   ☐ Other (please specify):_____

3. Describe the condition of the bank (e.g., height, slope, extent of vegetative cover) of the aquatic feature.

   _____
   _____
   _____
   _____

4. Is there a discharge from the facility to the aquatic feature? ☐ Yes ☐ No
   If yes, describe the origin of each discharge and its migration path:

   _____
   _____
   _____
   _____

5. Indicate the discharge point of the water body. Specify name, if known.

   _____
   _____
   _____

Flowing Aquatic Feature Questions (Continued)

6. If the flowing aquatic feature is a dry wash or arroyo, answer the following questions.
   - ❑ Check here if feature is not a dry wash or arroyo

   If known, specify the average number of days in a year in which flowing water is present in the feature: _____

   Is standing water or mud present? Check all that apply.
   - ❑ Standing water
   - ❑ Mud
   - ❑ Neither standing water or mud

   Does the area show evidence of recent flow (e.g., flood debris clinging to vegetation)?
   - ❑ Yes
   - ❑ No
   - ❑ Not sure
7. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:

   _____
   _____
   _____
   _____

III.C Terrestrial Habitats

III.C.1 Wooded

Are any wooded areas on or adjacent to the site? ☐ Yes X No

If yes, indicate the wooded area on the attached site map and answer the following questions. If more than one wooded area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wooded area. Distinguish between wooded areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.2.

Wooded Area Questions

☐ On-site ☐ Off-site

Name or Designation:_____

1. Estimate the approximate size of the wooded area (in acres or sq. ft.)

2. Indicate the dominant type of vegetation in the wooded area.

   - ❑ Evergreen
   - ❑ Deciduous
   - ❑ Mixed

Dominant plant species, if known:_____

3. Estimate the vegetation density of the wooded area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the predominant size of the trees at the site. Use diameter at chest height.

   - ❑ 0-6 inches
   - ❑ 6-12 inches
   - ❑ >12 inches
   - ❑ No single size range is predominant

5. Animals observed in the wooded area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:_____

III.C.2 Shrub/Scrub

Are any shrub/scrub areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the shrub/scrub area on the attached site map and answer the following questions. If more than one shrub/scrub area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual shrub/scrub area. Distinguish between shrub/scrub areas, using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.3.

Shrub/Scrub Area Questions

X Onsite X Offsite

Name or Designation: Chihuahuan Desert Scrub (HAFB, 2011).

Note also: On-site areas are almost entirely gravel covered and void of habitat or vegetation with some apparent pockets of desert vegetation. Surrounding site habitat is characterized as Chihuahuan Desert. The habitat map (attached) shows that habitat surrounding the site is dominated by fourwing saltbush/alkali sacaton shrubland habitat, with lesser amounts of fourwing saltbush/gypsum dropseed shrubland and alkali sacaton grassland habitats.

1. Estimate the approximate size of the shrub/scrub area (in acres or sq. ft.). Surrounding HAFB are tens of thousands of acres of Chihuahuan Desert Scrub.

2. Indicate the dominant type of shrub/scrub vegetation present, if known.

According to information provided in Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011), the area around Building 1196 (OT-C535) is dominated by Fourwing Saltbush/Alkali Sacaton Shrubland with lesser amounts of fourwing saltbush/gypsum dropseed shrubland and alkali sacaton grassland habitats.

3. Estimate the vegetation density of the shrub/scrub area.

- ❑ Dense (i.e., greater than 75% vegetation)
- X Moderate (i.e., 25% to 75% vegetation)
- ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the scrub/shrub vegetation.

- ❑ 0-2 feet
- X 2-5 feet
- ❑ >5 feet

5. Animals observed in the shrub/scrub area or suspected to be present based on indirect evidence or file material:
   - X Birds
   - X Mammals
   - X Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:
   The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna associated with the shrubland habitat potentially present in the area of Building 1196. Surveys conducted at HAFB have identified fourteen species of rodents. Those that

could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam kangaroo rat (*Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus auduboni*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crookzi*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.3 Grassland

Are any grassland areas on or adjacent to the site? ☐ Yes X No

If yes, indicate the grassland area on the attached site map and answer the following questions. If more than one grassland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual grassland area. Distinguish between grassland areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.4.

Grassland Area Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Estimate the approximate size of the grassland area (in acres or sq. ft.)._____

2. Indicate the dominant plant type, if known.
_____
_____
_____
_____

3. Estimate the vegetation density of the grassland area.

- ❑ Dense (i.e., greater than 75% vegetation)
- ❑ Moderate (i.e., 25% to 75% vegetation)
- ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the dominant plant type (in ft. or in.)_

5. Animals observed in the grassland area or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, lizards)
- ❑ Amphibians (e.g., toads, salamanders)

Specify species, if known:

III.C.4 Desert

Are any desert areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the desert area on the attached site map and answer the following questions. If more than one desert area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual desert area. Distinguish between desert areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.5.

Desert Area Questions

X Onsite X Offsite
Name or Designation: Chihuahuan Desert

1. Estimate the approximate size of the desert area (in acres or sq. ft.).
This site including HAFB is contained within tens of thousands of acres of the Chihuahuan Desert.

2. Describe the desert area (e.g., presence or absence of vegetation, vegetation types, presence/size of rocks, sand, etc.)
Many volumes of literature have been written on the natural biota of the Chihuahuan Desert. Detailed descriptions about the biotic communities within HAFB can be found in the HAFB Integrated Natural Resource Management Plan, (HAFB, 2011). Habitats directly associated with this Site include typical desert scrub communities.

3. Animals observed in the desert area or suspected to be present based on indirect evidence or file material:

X Birds
X Mammals
X Reptiles (e.g., snakes, lizards)
☐ Amphibians (e.g., toads, salamanders)

Specify species, if known:

The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna associated with the shrubland habitat potentially present in the area of Building 1196. Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam

kangaroo rat (*Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.5 Other

1. Are there any other terrestrial communities or habitats on or adjacent to the site which were not previously described?

☐ Yes X No

If yes, indicate the "other" area(s) on the attached site map and describe the area(s) below. Distinguish between onsite and offsite areas. If no, proceed to Section III.D.

III.D Sensitive Environments and Receptors

1. Do any other potentially sensitive environmental areas[2] exist adjacent to or within 0.5 miles of the site? If yes, list these areas and provide the source(s) of information used to identify sensitive areas. *Do not answer "no" without confirmation from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

The following is taken from the Integrated Natural Resources Management Plan for HAFB (HAFB,2011). HAFB and its Geographically Separated Units (GSUs) have high biodiversity, including many sensitive species. No threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The White Sands pupfish is not Federally-listed nor has critical habitat been designated because of the multi-agency cooperative agreement to manage the species to support viable populations through habitat management and research.

Most of the sensitive species are birds that are either associated with grassland habitats on main base or with wetland habitats, primarily in the Lake Holloman Public Access Area wetlands complex south of the Cantonment. Sensitive grassland and desert species at HAFB that are discussed in further detail in the management plan include:

- White Sands pupfish

2 Areas that provide unique and often protected habitat for wildlife species. These areas are typically used during critical life stages such as breeding, hatching, rearing of young and overwintering. Refer to **Table 1** at the end of this document for examples of sensitive environments.

- Acarospora clauzadeana lichen
- Grassland neotropical migratory birds
- Western burrowing owl
- Aplomado falcon
- Grassland raptors
- Bats
- Texas horned lizard and other reptiles

2. Are any areas on or near (i.e., within 0.5 miles) the site which are owned or used by local tribes? If yes, describe. *Contact the Tribal Liason in the Office of the Secretary (505)827-2855 to obtain this information.*

No

3. Does the site serve or potentially serve as a habitat, foraging area, or refuge by rare, threatened, endangered, candidate and/or proposed species (plants or animals), or any otherwise protected species? If yes, identify species. *This information should be obtained from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

No, based on information in the Integrated Natural Resources Management Plan, no threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The plan establishes protocols for management of sensitive desert and grassland habitats.

4. Is the site potentially used as a breeding, roosting or feeding area by migratory bird species? If yes, identify which species.

Likely not. The site has very limited viable habitat due to the disturbed nature of the site, but areas surrounding the site could potentially provide habitat for these purposes.

5. Is the site used by any ecologically[3], recreationally, or commercially important species? If yes, explain.

No

IV. EXPOSURE PATHWAY EVALUATION

1. Do existing data provide sufficient information on the nature, rate, and extent of

3 Ecologically important species include populations of species which provide a critical (i.e., not replaceable) food resource for higher organisms and whose function as such would not be replaced by more tolerant species; or perform a critical ecological function (such as organic matter decomposition) and whose functions will not be replaced by other species. Ecologically important species include pest and opportunistic species that populate an area if they serve as a food source for other species, but do not include domesticated animals (e.g., pets and livestock) or plants/animals whose existence is maintained by continuous human interventions (e.g., fish hatcheries, agricultural crops, etc.,)

contamination at the site?

X Yes
❑ No
❑ Uncertain

Please provide an explanation for your answer: Sample results have sufficiently characterized the site.

2. Do existing data provide sufficient information on the nature, rate, and extent of contamination in offsite affected areas?

□ Yes
❑ No
❑ Uncertain
X No offsite contamination

Please provide an explanation for your answer:_____
No offsite contamination is expected, and no off-site soil or groundwater samples were collected.

3. Do existing data address potential migration pathways of contaminants at the site?

X Yes
❑ No
❑ Uncertain

Please provide an explanation for your answer

While potential migration from impacted soils to groundwater might occur, no groundwater was observed at this site.

4. Do existing data address potential migration pathways of contaminants in offsite affected areas?

□ Yes
❑ No
❑ Uncertain
X No offsite contamination

Please provide an explanation for your answer:

See response to No. 3 presented previously. Also, no off-site soil contamination is expected.

5. Are there visible indications of stressed habitats or receptors on or near (i.e., within 0.5 miles) the site that may be the result of a chemical release? If yes, explain. Attach photographs if available.

No.

6. Is the location of the contamination such that receptors might be reasonably expected to come into contact with it? For soil, this means contamination in the soil 0 to 5 feet below ground surface (bgs). If yes, explain.

Yes. Some soil samples were collected in site areas where receptors might contact detected constituents.

7. Are receptors located in or using habitats where chemicals exist in air, soil, sediment or surface water? If yes, explain.

Yes. See response to No. 6 presented above.

8. Could chemicals reach receptors via groundwater? Can chemicals leach or dissolve to groundwater? Are chemicals mobile in groundwater? Does groundwater discharge into receptor habitats? If yes, explain.

No. Groundwater is not present below the site.

9. Could chemicals reach receptors through runoff or erosion? Answer the following questions:

What is the approximate distance from the contaminated area to the nearest watercourse or arroyo?

- ❑ 0 feet (i.e., contamination has reached a watercourse or arroyo)
- ❑ 1-10 feet
- ❑ 11-20 feet
- ❑ 21-50 feet
- ❑ 51-100 feet
- ❑ 101-200 feet
- ❑ > 200 feet
- ❑ > 500 feet
- X > 1000 feet

What is the slope of the ground in the contaminated area?

- X 0-10%
- ❑ 10-30%
- ❑ > 30%

What is the approximate amount of ground and canopy vegetative cover in the contaminated area?

- ❑ < 25%
- X 25-75%
- ❑ > 75%

Is there visible evidence of erosion (e.g., a rill or gully) in or near the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

Do any structures, pavement, or natural drainage features direct run-on flow (i.e., surface flows originating upstream or uphill from the area of concern) into the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

10. Could chemicals reach receptors through the dispersion of contaminants in air (e.g., volatilization, vapors, fugitive dust)? If yes, explain.

Yes. However, detected concentrations of constituents in soil do not generally exceeding relevant background values or ecological screening criteria (see screening assessment in main text).

11. Could chemicals reach receptors through migration of non-aqueous phase liquids (NAPLs)? Is a NAPL present at the site that might be migrating towards receptors or habitats? Could NAPL discharge contact receptors or their habitat?

No NAPLs are present at the site.

12. Could receptors be impacted by external irradiation at the site? Are gamma emitting radionuclides present at the site? Is the radionuclide contamination buried or at the surface?

No. No radionuclide contamination is expected to be present at the site.

PHOTOGRAPHIC DOCUMENTATION

During the site visit(s), photographs should be taken to document the current conditions at the site and to support the information entered in the checklist. For example, photographs may be used to document the following:

- The nature, quality, and distribution of vegetation at the site
- Receptors or evidence of receptors
- Potentially important ecological features, such as ponds and drainage ditches
- Potential exposure pathways
- Any evidence of contamination or impact

SUMMARY OF OBSERVATIONS AND SITE SETTING

Include information on significant source areas and migration pathways that are likely to constitute complete exposure pathways.

Although potentially complete exposure pathways exist (e.g. direct contact with surface soil), significant source areas are not present, as results of the screening assessment (see main text) indicate that detected concentrations of constituents in soil do not generally exceeding relevant ecological screening criteria.

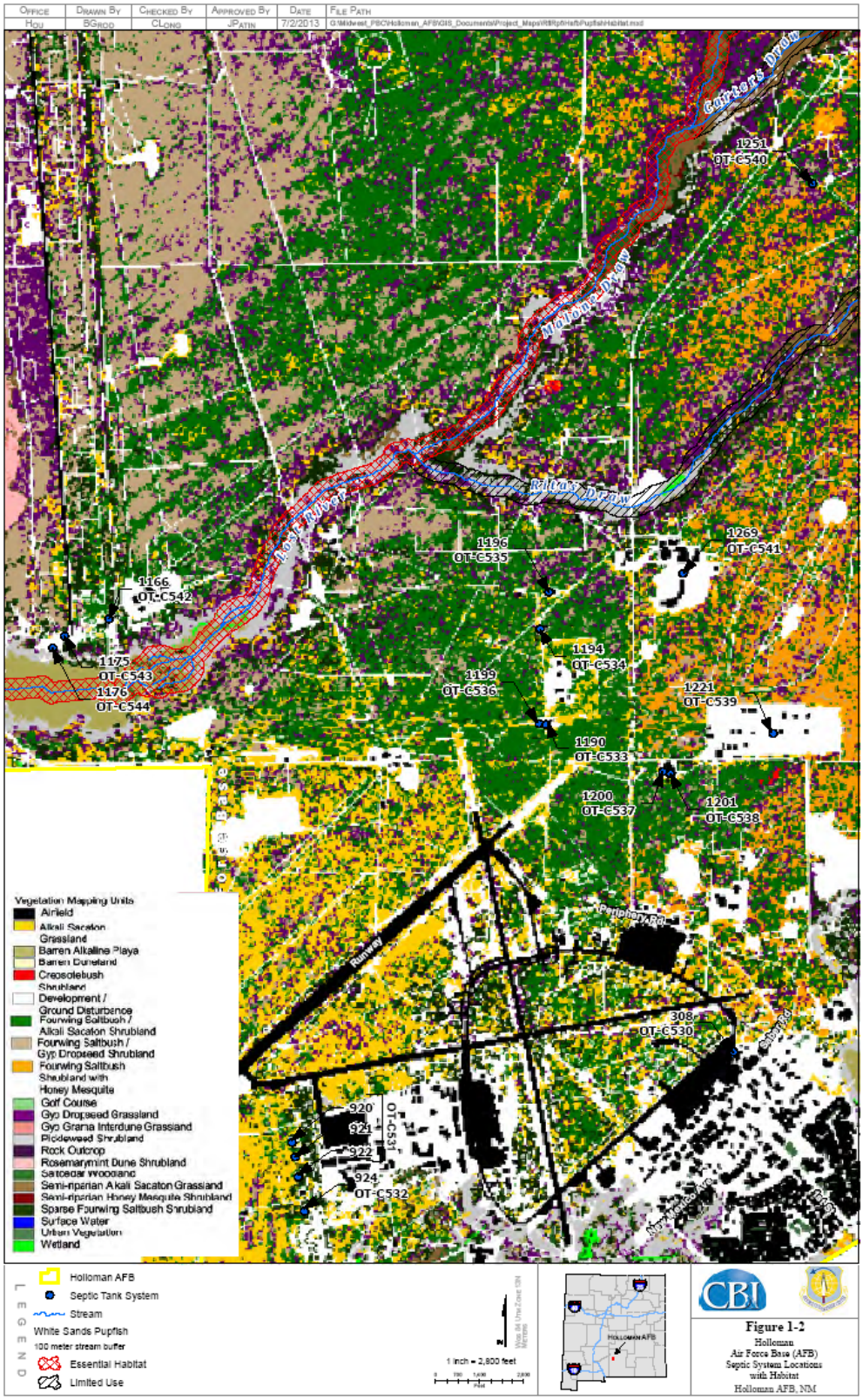
Checklist Completed by William Squire

Affiliation CB&I Federal Services, LLC.

Author Assisted by William Stanhope, CB&I Federal Services, LLC.

Date July 25, 2013

Building 1196 Location


Office
Hou
Drawn By
BGrod
Checked By
CLong
Approved By
JPatin
Date
7/2/2013
File Path
G:\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RBRp0HafbPupfishHabitat.mxd
Carlsbad Drain
Malaga Draw
Rocky Draw
Rocky River
1251
OT-C540
1269
OT-C541
1196
OT-C535
1166
OT-C542
1194
OT-C534
1175
OT-C543
1176
OT-C544
1199
OT-C536
1221
OT-C539
1190
OT-C533
1200
OT-C537
1201
OT-C538
Peripheral Rd
Runway
308
OT-C530
920
924
922
924
OT-C532
OT-C531
Vegetation Mapping Units
Airfield
Alkali Sacaton Grassland
Barren Alkaline Playa
Barren Dunefland
Creosotebush Shrubland
Development / Ground Disturbance
Fourwing Saltbush / Alkali Sacaton Shrubland
Fourwing Saltbush / Gyp Dropseed Shrubland
Fourwing Saltbush Shrubland with Honey Mesquite
Golf Course
Gyp Dropseed Grassland
Gyp Grama Interdune Grassland
Pickleweed Shrubland
Rock Outcrop
Rosemarymint Dune Shrubland
Saltcedar Woodland
Semi-riparian Alkali Sacaton Grassland
Semi-riparian Honey Mesquite Shrubland
Sparse Fourwing Saltbush Shrubland
Surface Water
Urban Vegetation
Wetland
Legend
Holloman AFB
Septic Tank System
Stream
White Sands Pupfish
100 meter stream buffer
Essential Habitat
Limited Use
1 inch = 2,800 feet
Holloman AFB
CBI
Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
with Habitat
Holloman AFB, NM

REFERENCES

Holloman Air Force Base (HAFB), 2011. *Integrated Natural Resource Management Plan*, February.

Holloman Air Force Base (HAFB), 2007. *Holloman Air Force Base Septic Tanks*, April.

New Mexico Environment Department (NMED), 2012. *Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document*, Hazardous Waste Bureau and Ground Water Quality Bureau, February, Table A-1 updated June 2012.

North Wind, Inc., 2008. *Technical Memorandum Summarizing Decommissioning Work Conducted on Inactive Septic Tanks at Holloman AFB*, March.

TABLE 1
EXAMPLES OF SENSITIVE ENVIRONMENTS

National Parks and National Monuments

Designated or Administratively Proposed Federal Wilderness Areas

National Preserves

National or State Wildlife Refuges

National Lakeshore Recreational Areas

Federal land designated for protection of natural ecosystems

State land designated for wildlife or game management

State designated Natural Areas

Federal or state designated Scenic or Wild River

All areas that provide or could potentially provide critical habitat[1] for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern

All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes

All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)

---

1 Critical habitats are defined by the Endangered Species Act (50 CFR §424.02(d)) as:

> 1) Specific areas within the geographical area currently occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (ii) that may require special management considerations or protection, and 2) Specific areas outside the geographical area occupied by a species at the time it is listed upon a determination by the Secretary [of Interior] that such areas are essential for the conservation of the species.

All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)

All areas that provide or could potentially provide habitat for song birds as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-13)

All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)

All areas that provide or could potentially provide habitat for horned toads and Bullfrogs as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, resp.)

All perennial waters (e.g., rivers, lakes, playas, sloughs, ponds, etc)

All ephemeral drainage (e.g., arroyos, puddles/pools, intermittent streams, etc) that provide significant wildlife habitat or that could potentially transport contaminants off site to areas that provide wildlife habitat

All riparian habitats

All perennial and ephemeral wetlands (not limited to jurisdictional wetlands)

All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle.

ATTACHMENT B

ECOLOGICAL SITE EXCLUSION CRITERIA CHECKLIST AND DECISION TREE

1. NEW MEXICO ECOLOGICAL EXCLUSION CRITERIA CHECKLIST

The following questions are designed to be used in conjunction with the Ecological Exclusion Criteria Decision Tree (Figure 1). After answering each question, refer to the Decision Tree to determine the appropriate next step. In some cases, questions will be omitted as the user is directed to another section as indicated by the flow diagram in the Decision Tree. For example, if the user answers "yes" to Question 1 of Section I, he or she is directed to proceed to Section II.

I. Habitat

In the following questions, "affected property" refers to all property on which a release has occurred or is believed to have occurred, including off-site areas where contamination may have occurred or migrated.

1. Are any of the below-listed sensitive environments at, adjacent to, or in the locality1 of the affected property?

   - National Park or National Monument
   - Designated or administratively proposed Federal Wilderness Area
   - National Preserve
   - National or State Wildlife Refuge
   - Federal or State land designated for wildlife or game management
   - State designated Natural Areas
   - All areas that are owned or used by local tribes
   - All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle
   - All areas that provide or could potentially provide habitat for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern
   - All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes
   - All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)
   - All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)
   - All areas that provide or could potentially provide habitat for song birds as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game

1 *Locality* of the site refers to any area where an ecological receptor is likely to contact site-related chemicals. The locality of the site considers the likelihood of contamination migrating over time and places the site in the context of its general surrounding. Therefore, the locality is typically larger than the site and the areas adjacent to the site.

and Fish, 17-2-13)

- All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)
- All areas that provide or could potentially provide habitat for horned toads and bullfrogs as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, respectively)

2. Does the affected property contain land areas which were not listed in Question 1, but could be considered viable ecological habitat? The following are examples (but not a complete listing) of viable ecological habitats:

- Wooded areas
- Shrub/scrub vegetated areas
- Open fields (prairie)
- Other grassy areas
- Desert areas
- Any other areas which support wildlife and/or vegetation, excluding areas which support only opportunistic species (such as house mice, Norway rats, pigeons, etc.) that do not serve as prey to species in adjacent habitats.

The following features are <u>not</u> considered ecologically viable:

- Pavement
- Buildings
- Paved areas of roadways
- Paved/concrete equipment storage pads
- Paved manufacturing or process areas
- Other non-natural surface cover or structure

3. Does the affected property contain any perennial or ephemeral aquatic features which were not listed in Question 1?

II. Receptors

1. Is any part of the affected property used for habitat, foraging area, or refuge by any rare, threatened, or endangered species (plant *or* animal), or otherwise protected species (e.g., raptors, migratory birds)?

2. Is any part of the affected property used for habitat, foraging area, or refuge by any species used as a recreational (e.g., game animals) and/or commercial resource?

3. Is any part of the affected property used for habitat, foraging area, or refuge by any plant or animal species? This includes plants considered "weeds" and opportunistic insect and animal species (such as cockroaches and rats) if they are used as a food source for other species in the area.

III. Exposure Pathways

1. Could receptors be impacted by contaminants via direct contact?

   Is a receptor located in or using an area where it could contact contaminated air, soil[3], or surface water?

For Questions 2 and 3, note that one must answer "yes" to all three bullets in order to be directed to the "exclusion denied" box of the decision tree. This is because answering "no" to one of the questions in the bullet list indicates that a complete exposure pathway is not present. For example, in Question 2, if the chemical cannot leach or dissolve to groundwater (bullet 1), there is no chance of ecological receptors being exposed to the chemical through contact with contaminated groundwater. Similarly, the responses to the questions in Question 4 determine whether a complete pathway exists for exposure to NAPL.

2. Could receptors contact contaminants via groundwater?
   - Can the chemical leach or dissolve to groundwater[4]?
   - Can groundwater mobilize the chemical?
   - Could (does) contaminated groundwater discharge into known or potential receptor habitats?

3. Could receptors contact contaminants via runoff (i.e., surface water and/or suspended sediment) or erosion by water or wind?
   - Are chemicals present in surface soils?
   - Can the chemical be leached from or eroded with surface soils?
   - Is there a receptor habitat located downgradient of the leached/eroded surface soil?

---

3 For soil, this means contamination less than 5 feet below ground surface (bgs).

4 Information on the environmental fate of specific chemicals can be found on the Internet at *http://www.epa.gov/opptintr/chemfact/* or at a local library in published copies of the *Hazardous Substances Data Bank*.

4. Could receptors contact contaminants via migration of non-aqueous phase liquids (NAPL)?

- Is NAPL present at the site?
- Is NAPL migrating toward potential receptors or habitats?
- Could NAPL discharge impact receptors or habitats?

Figure 1 -Ecological Exclusion Criteria Decision Tree

(Refer to corresponding checklist for the full text of each question)

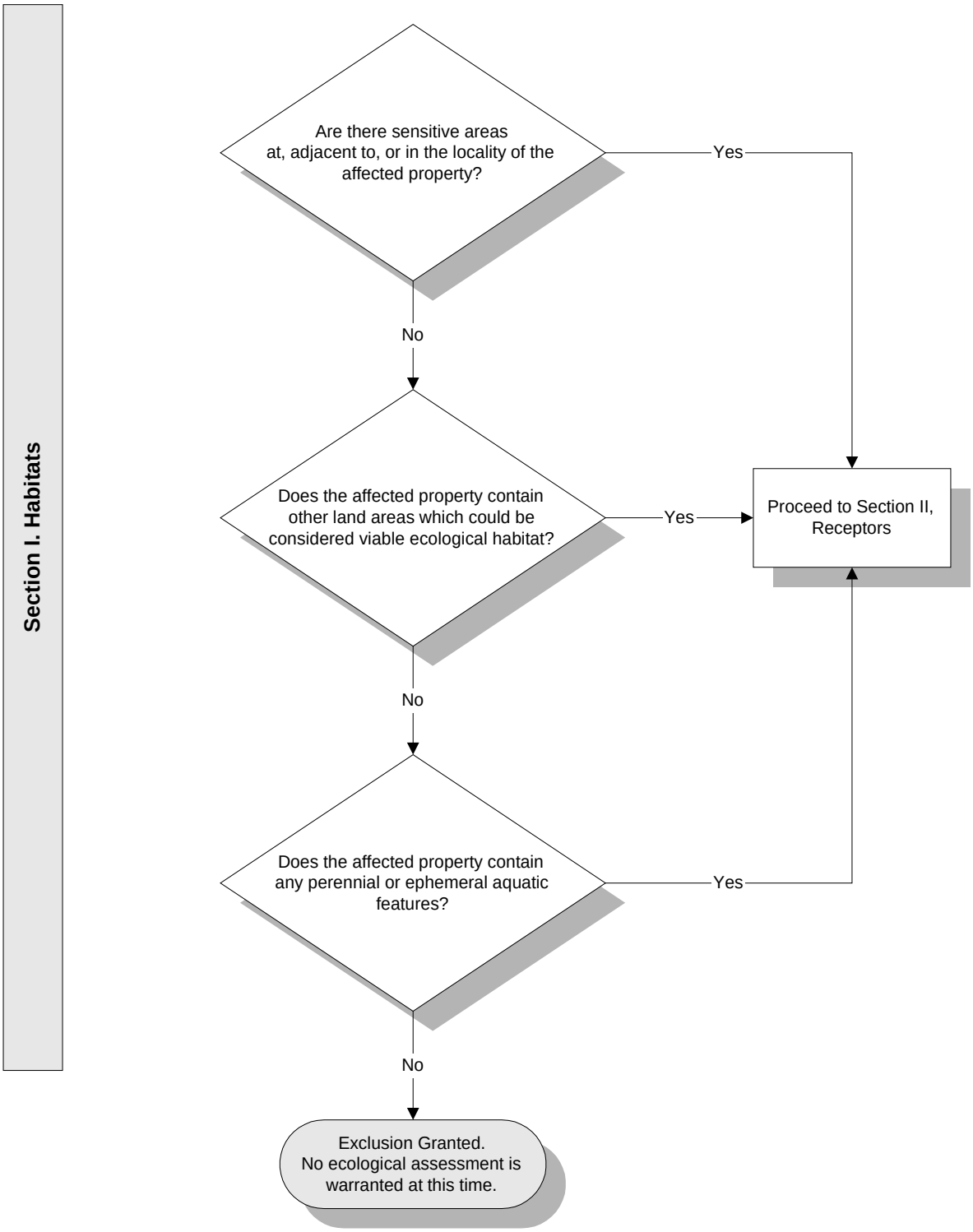


Figure 1 - Exclusion Criteria Decision Tree (continued)

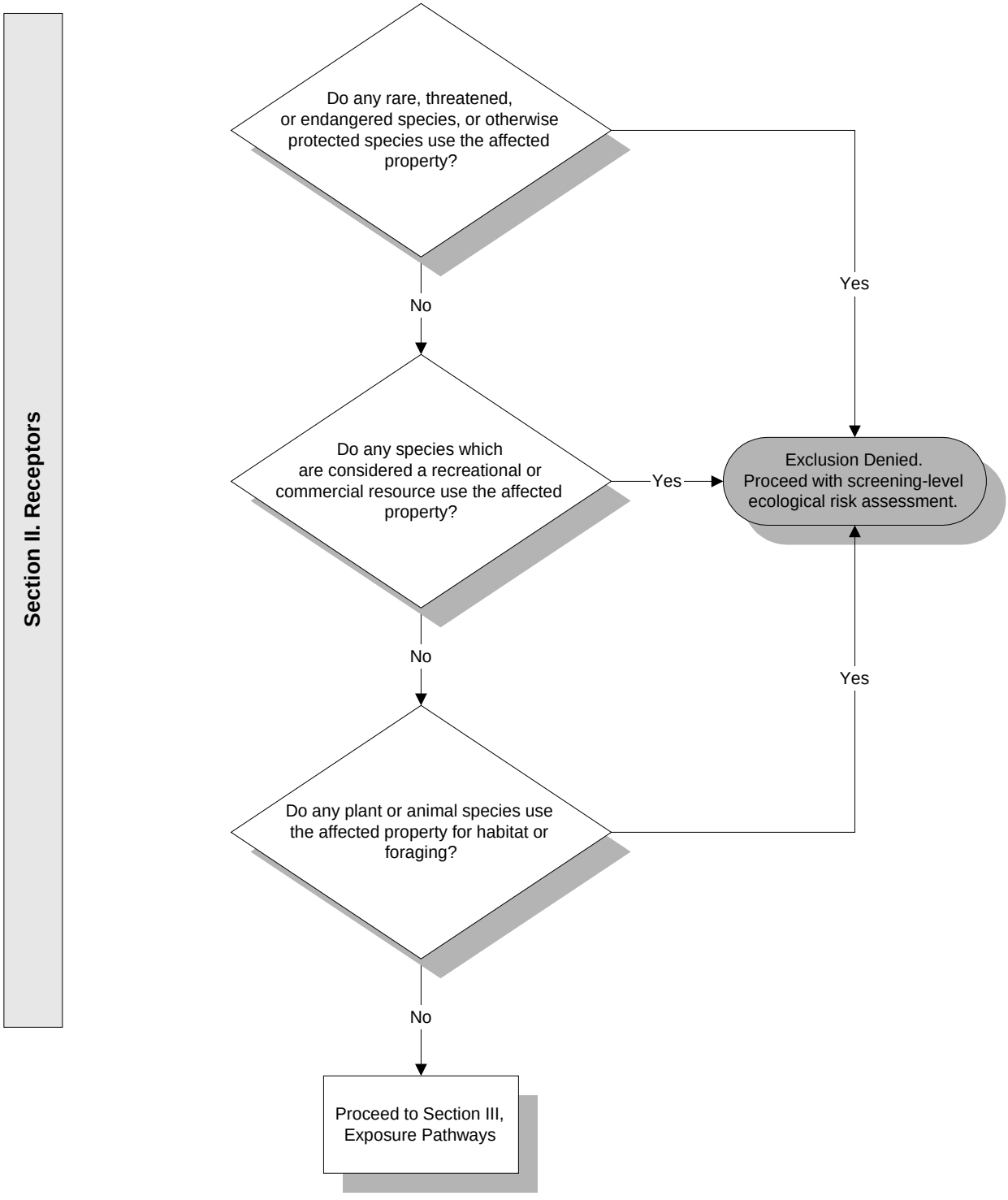


Figure 1 - Exclusion Criteria Decision Tree (continued)

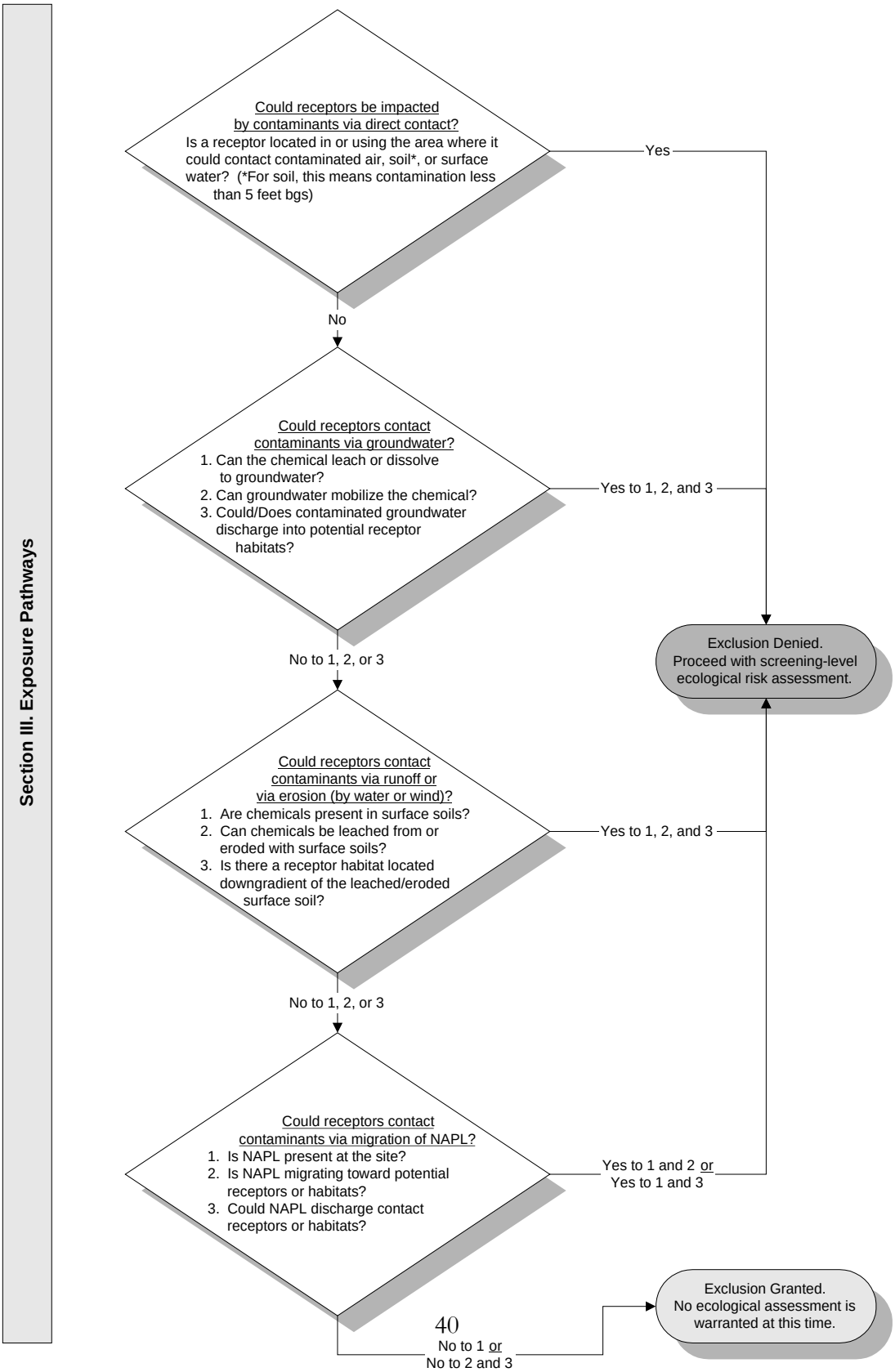


Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1196 (OT-C535) RFI Report
Holloman Air Force Base, New Mexico

Analyte		Sample Number	OTC535-IS-0001-062812		OTC535-IS-0003-062812		OTC535-IS-0005-062812		OTC535-IS-0007-062812		OTC535-IS-0008-062812-FD	
		Sample Date	6/28/2012		6/28/2012		6/28/2012		6/28/2012		6/28/2012	
		Location	Station 1, tank influent		Station 2, septic tank		Station 3, tank effluent		Station 4, leach field		Station 4, leach field	
		Depth (ft bgs)	3 - 5		7 - 9		3 - 5		3 - 5		3 - 5	
	Background Values - Soil (mg/kg)[a]	LANL (2012) ESLs (mg/kg)[b]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	**85.9**		**88**		**88.4**		**83.8**		**84.9**	
METALS (mg/kg)												
ALUMINUM	13722	pH Dependent	**1770**		**4330**		**6110**		**5340**		**6850**	
ARSENIC	3.7	6.8 / 68	**1.2**	J	**2.2**	J	**1.5**	J	**1.1**	J	**1.8**	J
BARIUM	169.3	110 / 260	**36.3**	J	**52.4**	J	**54.9**	J	**43.2**	J	**57.5**	J
CALCIUM	317332	NSV	**255000**		**219000**		**217000**		**211000**		**220000**	
CHROMIUM	25	28 / 280	**1.5**	J	**4.7**	J	**6**		**5.7**		**7.1**	J
COBALT	7.7	13 / 130	**0.89**	J	**1.6**	J	**2.3**	J	**1.9**	J	**2.3**	J
COPPER	13	15 / 46	**2.9**	J	**3.4**	J	**5.4**	J	**3.1**	J	**3.8**	J
IRON	23049	NSV	**1410**		**4350**		**6050**		**4420**		**5720**	
LEAD	10.9	14 / 28	**1.9**	J	**3.3**	J	**5.6**	J	**3.2**	J	**2.4**	J
MAGNESIUM	16991	NSV	**2750**		**3380**		**7400**		**4730**		**5960**	
MANGANESE	393	220 / 1,100	**25.3**		**147**		**138**		**79.1**		**112**	
NICKEL	17.4	9.7 / 19	**1.8**	J	**4**	J	**5.2**	J	**4.7**	J	**6.1**	J
POTASSIUM	5077	NSV	**524**	J	**1000**	J	**1670**	J	**1210**	J	**1580**	J
SILVER	1.1	2.6 / 26	0.49	U	0.48	U	0.49	U	0.49	U	0.37	U
SODIUM	5196	NSV	540	U	530	U	**2120**	J	**2120**	J	**2370**	J
VANADIUM	42.6	0.025 / 0.25	4.3	J	14	J	11.3	J	11.7	J	15.4	J
ZINC	54.6	48 / 480	**5**	J	**10.4**		**19.2**		**12.5**		**14.7**	J

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1196 (OT-C535) RFI Report
Holloman Air Force Base, New Mexico

LANL (2012) ESL values represented as: No-Effect ESL / Low-Effect ESL (e.g., 6.8 / 68 for arsenic)

LANL (2012) ESL Exceeded

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] Los Alamos National Laboratory (LANL), 2012, ECORISK Database, LA-UR-12-24548, Release 3.1, October.

ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
FD = field duplicate sample
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
VQ = validation qualifier

Final

RCRA Facility Investigation Report
Group 1 – Building 1199 (OT-C536)
Holloman Air Force Base, New Mexico

Prepared for U.S. Air Force Civil Engineer Center
2261 Hughes Ave., Suite 155
Lackland Air Force Base, Texas 78236-9861

Prepared by Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

Contract No. FA8903-09-D-8580
Task Order No. 0013
Project No. 144106
Revision 0
October 2013

Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)

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Acronyms and Abbreviations

AFB	Air Force Base
bgs	below ground surface
COPC	constituent of potential concern
DPT	direct push technology
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
ft	foot/feet
GPR	ground-penetrating radar
GRO	gasoline range organics
HI	hazard index
IDW	investigation-derived waste
LANL	Los Alamos National Laboratory
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MCL	maximum contaminant level
MDL	method detection limit
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
ORO	oil range organics
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RSL	Regional Screening Level
Shaw	Shaw Environmental & Infrastructure, Inc. (a CB&I Company)
SLERA	screening-level ecological risk assessment
SSL	soil screening level
SVOC	semivolatile organic compound
TAL	target analyte list
TDS	total dissolved solids
TPH	total petroleum hydrocarbons
VOC	volatile organic compound
WQS	water quality standards

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1.0 INTRODUCTION

Shaw Environmental & Infrastructure. Inc. (Shaw), a CB&I company, prepared this Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for the Air Force Civil Engineer Center (formerly the Air Force Center for Engineering and the Environment) under Contract No. FA8903-09-D-8580, Task Order No. 0013, Modification 01. Results presented in this report are from the investigation and corrective measures of the abandoned septic tank located at Building 1199 (OT-C536) at Holloman Air Force Base (AFB), New Mexico, which was one of the fifteen Group 1 septic tank sites under the Midwestern Region Performance-Based Remediation Contract. This RFI Report has been prepared pursuant to the requirements of the Holloman AFB Hazardous Waste Facility RCRA Permit No. NM6572124422 (the Permit) (New Mexico Environment Department [NMED], 2004). The purpose of this RFI was to delineate potential contamination that may have been released to the environment from the Building 1199 septic tank system.

Holloman AFB is situated in south-central New Mexico in the northwest central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). The 15 Group 1 former septic tank sites are located throughout Holloman AFB (Figure 1-2). Each former septic tank is positioned adjacent to a building, and is named in reference to the building, along with a numerical identification. As such, the 15 Group 1 septic tank systems are the following: OT-C530 (Building 308), OT-C531 (Buildings 920, 921, and 922), OT-C532 (Building 924), OT-C533 (Building 1190), OT-C534 (Building 1194), OT-C535 (Building 1196), OT-C536 (Building 1199), OT-C537 (Building 1200), OT-C538 (Building 1201), OT-C539 (Building 1221), OT-C540 (Building 1251), OT-C541 (Building 1269), OT-C542 (Building 1166), OT-C543 (Building 1175), and OT-C544 (Building 1176). This report presents a summary of the RFI work conducted at abandoned septic tank OT-C536 at Building 1199.

Building 1199 was constructed in 1957 as a rocket fuel laboratory. The fuels laboratory contained a toilet, urinal, lavatory, and shower. In 1987, the building was converted to the security forces kennel. After conversion, the building contained a toilet, urinal, and stainless steel sink. The *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) report in Appendix A indicated that the septic system was inactive as of 2006. The septic tank was abandoned in place in January 2008 by opening the tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill (North Wind, Inc., 2008, also included in Appendix A). Building 1199 was razed some time after the septic tank abandonment; demolition records are not available.

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1.1 Purpose of the Investigation

Investigative activities were undertaken at Holloman AFB to determine the nature and extent of contamination, and propose recommendations for either closure or additional corrective action, if necessary, at 15 inactive, abandoned, or removed septic tank systems, following the general guidance for closing septic systems found in 20.7.3.307 New Mexico Administrative Code (NMAC) Standards – Abandoned Sewers and On-Site Liquid Waste Systems.

Project quality objectives for each septic tank site consisted of the following:

- Gather and review all site historical information
- Identify septic tank components and historical uses
- Remove septic tank contents and contaminated soil (where necessary), and abandon the tank (where necessary)
- Determine the nature and extent of residual constituents of concern at each site, including potential pathways to groundwater
- Evaluate the risk at each site
- Develop conclusions and recommendations for each site.

This RFI Report presents the data collected to meet these project quality objectives at the Building 1199 abandoned septic tank.

1.2 Scope of Activities

This RFI Report describes all activities associated with the septic tank investigation and remediation at Building 1199, including soil and groundwater sampling, sample analysis, as-built pipe mapping, and site boundary survey. All work was performed in accordance with the *Basewide Septic Tank Solid Waste Management Unit RFI Work Plan* (U.S. Army Corps of Engineers [USACE], 2010) and the *Quality Program Plan* (Shaw, 2012a). The *Quality Program Plan* (Shaw, 2012) contains the Site Safety and Health Plan; the Uniform Federal Policy–Sampling and Analysis Plan/Quality Assurance Project Plan; and the Construction Quality Plan, which defines the methodology and practices that were used to control construction work during the performance of the RFI.

1.3 Regulatory Setting

The Permit (NMED, 2004) established the general and specific standards and activities for managing hazardous waste pursuant to Subtitle C of RCRA, the New Mexico Hazardous

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Waste Act, and the New Mexico Hazardous Waste Management Regulations. The Permit also set forth requirements for investigation, notification, corrective action, and reporting for the storage, management, and releases of hazardous wastes.

The 15 septic systems were either abandoned, inactive, or previously removed, as indicated in *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) (Appendix A), and were not listed in the Permit (NMED, 2004). The Holloman AFB *RFI Work Plan* (USACE, 2010) was approved by NMED in a letter dated January 13, 2010 (NMED, 2010). The NMED-approved *RFI Work Plan* (USACE, 2010) contained investigation activities only; therefore, Shaw submitted a *Final Voluntary Corrective Measures Request – Septic Tanks Sites* (Shaw, 2012b) to include remediation and closure tasks that address septic system abandonment using 20.7.3.307 NMAC (Abandoned Sewers and On-Site Liquid Waste Systems). NMED has primary regulatory responsibility for the septic system sites; therefore corrective action must be performed under Title 20 NMAC.

The septic tank investigations were based on action/cleanup levels stipulated in Appendix 4-F of the Permit to be protective of human health and the environment. Permit Appendix 4-F specifies that soil contaminant concentrations be compared with the NMED residential soil screening levels (SSL), as presented in the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a), or the U.S. Environmental Protection Agency (EPA) Regional Screening Levels (RSLs) as presented in the *U.S. Environmental Protection Agency (EPA) Regions 3, 6, and 9 Regional Screening Levels for Chemical Contaminants at Superfund Sites* (EPA, 2012a), if no NMED SSL has been established (EPA, 2012a). Holloman AFB also has NMED-approved background concentrations for metals in soil (NMED, 2012b).

For groundwater, the Permit specifies that the more stringent of either the New Mexico Water Quality Control Commission (NMWQCC) water quality standards (WQS) (20.6.2 NMAC), or the EPA drinking water maximum contaminant levels (MCLs), be used for comparison with measured sample concentrations (EPA, 2012b).

1.4 RFI Report Organization

This RFI Report is organized into the following sections:

- **Section 1.0, Introduction**: identifies the objectives and purpose of this report.
- **Section 2.0, Environmental Setting**: provides pertinent descriptions of history, location, physiography, topography, surface water, hydrology, regional geology, soil types, regional hydrogeology, climate, current and future land use, and current and future water use for Holloman AFB.

- **Section 3.0, Source Characterization**: presents the data collection techniques and locations as well as analytical methods.

- **Section 4.0, Investigation Results and Evaluation**: details the soil and groundwater analytical results, summarizes the geochemical evaluation, and provides the results of the human health risk and ecological evaluations.

- **Section 5.0, Data Quality Assurance and Data Quality Control Review**: summarizes the analytical data validation results.

- **Section 6.0, Conclusions and Recommendations**: presents the conclusions and recommendations of this RFI report.

- **Section 7.0, References**: lists the references cited in this report.

In addition to the figures and tables listed in the table of contents, the following appendices are included in this report:

- **Appendix A** – Historical Records
- **Appendix B** – Photographic Log
- **Appendix C** – Geophysical Report
- **Appendix D** – Sample Collection Logs
- **Appendix E** – Boring Logs
- **Appendix F** – Well Construction Diagrams
- **Appendix G** – Well Purge Records
- **Appendix H** – Site Survey Data
- **Appendix I** – Laboratory Analytical Data and Data Validation Checklists
- **Appendix J** – Waste Manifests
- **Appendix K** – Geochemical Evaluation
- **Appendix L** – Risk Evaluation Calculations
- **Appendix M** – Ecological Evaluation.

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2.0 ENVIRONMENTAL SETTING

This section provides background information for Holloman AFB including physical setting, history, topography, climate, soils, geology, hydrology, and land and water use.

2.1 Physical Setting

Holloman AFB is situated in south-central New Mexico, in the northwest-central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). Holloman AFB has a population of 6,000, and occupies 59,639 acres in the northeast quarter of Section 1, Township 17 South, Range 8 East. The White Sands Missile Range testing facilities occupy additional land extending northward from the base. Privately- and publicly-owned lands border the remainder of Holloman AFB. The major highway servicing Holloman AFB is Highway 70, which runs southwest from the town of Alamogordo, New Mexico, and separates Holloman AFB from publicly owned lands to the south. Alamogordo, New Mexico, which has a population of 30,401 according to the 2010 U.S. Census, is located approximately 7 miles east of the base.

2.2 Holloman Air Force Base History

Holloman AFB was first established in 1942 as Alamogordo Army Air Field. From 1942 through 1945, Alamogordo Army Air Field served as the training grounds for over 20 different flight groups, flying primarily B-17s, B-24s, and B-29s. After World War II, most operations had ceased at the base. In 1947, Air Material Command announced the air field would be its primary site for the testing and development of unmanned aircraft, guided missiles, and other research programs. On January 13, 1948, the Alamogordo installation was renamed in honor of the late Colonel George V. Holloman, a pioneer in guided missile research. In 1968, the 49th Tactical Fighter Wing arrived at Holloman AFB, and has remained since. Today, Holloman AFB also serves as the training center for the German Air Force's Tactical Training Center.

2.3 Physiography and Topography

Holloman AFB is located within the Sacramento Mountains physiographic province on the western edge of the Sacramento Mountains. The base is approximately 59,600 acres in area, and is located at a mean elevation of 4,093 feet (ft) above mean sea level. The region is characterized by high tablelands with rolling summit plains; cuesta-formed mountains dipping eastward; and west-facing escarpments, with the wide bracketed basin forming the basin and range complex. Holloman AFB is located in the Tularosa Basin, which is part of the Central Closed Basins. The bordering mountains rise abruptly to altitudes of 7,000 to 12,000 ft above mean sea level. The San Andres Mountains bound the basin to the west

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(approximately 30 miles) with the Sacramento Mountains approximately 10 miles to the east (Figure 2-1). At its widest, the basin is approximately 60 miles east to west, and stretches approximately 150 miles north to south.

2.4 Climate

As a whole, New Mexico has a mild, arid to semiarid continental climate characterized by light precipitation totals, abundant sunshine, relatively low humidity, and relatively large annual and diurnal temperature ranges (Western Regional Climate Center, 2013). The climate of the Central Closed Basins varies with elevation. The base is located in the low areas and is characterized by warm temperatures and dry air. Daytime temperatures often exceed 100 degrees Fahrenheit in the summer months, and are in the middle 50s (degrees Fahrenheit) in the winter. A preponderance of clear skies and relatively low humidity permits rapid nighttime cooling resulting in average diurnal temperature ranges of 25 to 35 degrees Fahrenheit. Potential evapotranspiration, at 67 inches per year, significantly exceeds annual precipitation, usually less than 15 inches. Arid conditions resulting from very low rainfall amounts, coupled with the topographically induced wind patterns combining with the sparse vegetation, tend to cause localized “dust devils.” The annual rainfall for Alamogordo, New Mexico is 12 inches per year. Much of the precipitation falls during the midsummer monsoonal period (July and August) as brief, yet frequent, intense thunderstorms culminating in 30 to 40 percent of the total annual rainfall.

2.5 Regional Geology and Soils

2.5.1 Geology

The sedimentary rocks that make up the adjacent mountain ranges are between 250 and 500 million years old (New Mexico Bureau of Geology and Mineral Resources, 2012). During the period when the area was submerged beneath the shallow intracontinental sea, the layers of limestone, shale, gypsum, and sandstone were formed. In time, these layers were pushed upward through various tectonic forces forming a large bulge on the surface. Approximately 10 million years ago, the center began to subside resulting in a vertical drop of thousands of feet, leaving the edges still standing (the present-day Sacramento and San Andres mountain ranges). In the millions of years following, rainfall, snowmelt, and wind eroded the mountain sediments depositing them in the valley (i.e., Tularosa Basin). Water carrying eroded limestone, dolomite, gravel, and other materials continue to flow into the basin.

As the Tularosa Basin is a bolson, which is a basin with no surface drainage outlet, sediments carried by surface water into a closed basin are bolson deposits. The overlying alluvium generally consists of unconsolidated gravels, sands, and clays. Soils in the basin are derived from the adjacent ranges as erosional deposits of limestone, dolomite, and gypsum. A fining

sequence from the ranges towards the basin's center characterizes the area with the near-surface soils as alluvial, eolian, and lacustrine deposits. The alluvial fan deposits are laterally discontinuous units of interbedded sand, silt, and clay while the eolian deposits consist primarily of gypsum sands. The eolian and alluvial deposits are usually indistinguishable due to the reworking of the alluvial sediment by eolian processes. The playa, or lacustrine deposits, consist of clay containing gypsum and are contiguous with the alluvial fan and eolian deposits throughout the base. Stiff caliche layers, varying in thickness, have been identified at different areas of the base.

2.5.2 Soils

The U.S. Natural Resources Conservation Service (formerly the Soil Conservation Service) has identified two soil associations in the vicinity of Holloman AFB: (1) the Holloman-Gypsum Land-Yesum Complex, and (2) the Mead silty clay loam (Figure 2-2) (U.S. Department of Agriculture, 1981). The permeability of these horizons ranges from 4×10^{-4} to 1×10^{-3} centimeters per second.

The Holloman-Gypsum Land-Yesum Complex, 0 to 5 percent sloped soil, consists of larger areas of shallow and deep, well-drained soils and areas of exposed gypsum. The Holloman soil makes up approximately 35 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 13 inches of the substratum is pink, very fine sandy loam that is very high in gypsum. Below that, the substratum is white gypsum to a depth of more than 60 inches. This soil is calcareous and mildly alkaline to moderately alkaline. Permeability is moderate. Available water capacity is very low.

Gypsum Land makes up approximately 30 percent of the Holloman-Gypsum Land-Yesum Complex (0 to 5 percent slopes). Typically, less than 1 inch of very fine sandy loam overlies soft to hard, white gypsum. The deep Yesum consists of very fine sandy loam that makes up approximately 20 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 9 inches of the substratum is light brown, fine sandy loam that is very high in gypsum. Below that, the substratum is pink, very fine sandy loam to a depth of more than 60 inches. The soil is calcareous throughout, and is mildly alkaline. Permeability is moderate. Available water capacity is moderate. Many fine gypsum crystals are found throughout the profile.

The soil type found across the main drainage area for the installation is Mead silty clay loam, 0 to 1 percent slopes. This deep, poorly drained, nearly level soil is on outer fringes of alluvial fans. This soil formed in fine textured alluvium over lacustrine lake sediment. It is very high in salt content because of periodic flooding and poor drainage. Slopes are smooth and concave. Typically, the surface layer is reddish brown, silty clay loam, and clay loam

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approximately 5 inches thick. The substratum, to a depth of 48 inches, is light reddish brown clay that has a high content of salt. Below that, the substratum is lacustrine material of variable texture and color to a depth of more than 60 inches. Included within this soil are areas of Holloman soils and Gypsum Land along the margins of the unit of steep, short gully sides and knolls. These inclusions make up approximately 15 percent of the map unit for this soil type. Individual areas are generally smaller than 10 acres. This soil is moderately calcareous throughout and is moderately to strongly alkaline. It has a layer of salt that is more soluble than gypsum. Permeability is very low. Available water capacity is low (USACE, 2010).

2.6 Regional Hydrogeology

Groundwater occurs as an unconfined aquifer in the unconsolidated deposits of the central basin, with the primary source of recharge as rainfall percolation and minor amounts of stream runoff along the western edge of the Sacramento Mountains. Surface water/rainfall migrates downward into the alluvial sediments at the edge of the shallow aquifer near the ranges and flows through progressively finer-grained sediments towards the central basin. Because the Tularosa Basin is a closed system, water that enters the area leaves either through evaporation or percolation. This elevated amount of percolation results in a fairly high water table. Beneath Holloman AFB, groundwater ranges from 5 to 50 ft below ground surface (bgs). Flow for the base is generally towards the southwest with localized influences from the variations in the topography of the base (Figure 2-3). In the northern and western portions of the base, groundwater flows more to the west towards the Ritas Draw, Malone Draw, and Lost River drainages. Groundwater flow is affected by local topography in areas immediately adjacent to arroyos, where groundwater flows directly toward the drainages regardless of the regional flow pattern.

Groundwater in the Tularosa Basin is of potable quality at the recharge areas in close proximity to the Sacramento Mountains and becomes increasingly mineralized toward the central portion of the basin and discharge areas. The majority (over 70 percent) of the Environmental Restoration Program sites located across Holloman AFB have groundwater monitoring wells containing water with an average total dissolved solids (TDS) concentration greater than 10,000 milligrams per liter (mg/L). These TDS data support the hypothesis that TDS concentrations below 10,000 mg/L at Holloman AFB are caused by dilution of natural groundwater quality from leaking water lines and surface irrigation from the domestic water supply. TDS concentrations greater than 10,000 mg/L exceed the NMWQCC limit as potable water (20.6.2 NMAC), and thus, the groundwater beneath Holloman AFB has been designated as unfit for human consumption. Likewise, the EPA guidelines have identified the groundwater as a Class IIIB water source, characterized by TDS concentrations exceeding 10,000 mg/L, and is characterized by a low degree of

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interconnection with adjacent surface water or groundwater of a higher class. Groundwater does not discharge or connect to any adjacent aquifers, because the Tularosa Basin is a closed basin. Adjacent surface waters include Lost River and Lake Holloman, which also have high concentrations of TDS, and are not considered potential drinking water sources.

2.7 Surface Water and Hydrology

The Tularosa Basin contains all of the surface flow in its boundaries. The nearest inflow of surface waters to Holloman AFB comes from the Lost River, located in the north-central region of the base. The upper reaches of the Three Rivers and the Sacramento River are perennial in the basin. Holloman AFB is dissected by several southwest-trending arroyos that control the surface drainage. Hay Draw arroyo is located in the far north. Malone and Ritas Draws, which drain into the Lost River and Dillard Draw arroyos, are located along the eastern perimeter of the base. Approximately 10,000 years ago, indications are that a much wetter climate existed. The present-day Lake Otero encompassed a much larger area, possibly upwards of several hundred square miles. Its remains are the Alkali Flat and Lake Lucero. Lake Lucero is a temporary feature of merely a few inches in depth during the rainy season.

Ancient lakes and streams deposited water-bearing deposits over the older bedrock basement materials. Fractures, cracks, and fissures in the Permian and Pennsylvanian bedrock yield small quantities of relatively good-quality water in the deeper peripheral. Potable water is only found from wells near the edges of the basin, with more saline water towards the center. Two of the principal sources of potable water are: (1) a long narrow area on the upslope sides of Tularosa and Alamogordo, and (2) in the far southwestern part of the basin. A portion of the city of Alamogordo's water, as well as Holloman AFB's water, is supplied from Bonito Lake (which is in the Pecos River Basin).

2.8 Current and Future Land Use

The land surrounding Holloman AFB consists of residential areas to the east and northeast (city of Alamogordo), rangeland to the south, the White Sands National Monument to the west, and areas where military activities are conducted to the north. The desert terrain of the area immediately surrounding Holloman AFB has limited development, and there are no agricultural operations, residential communities, or large industrial operations located adjacent to the base. The Boles Well Field, a freshwater source for Holloman AFB, is located approximately 6 miles to the southeast of the base. Holloman AFB is an active military installation and is expected to remain active for the foreseeable future. No transfer of military property to the public is anticipated, and public access to the base is restricted. Future land use is not expected to differ significantly from current land use practices (Foster Wheeler Environmental Corporation, 2002).

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2.9 Current and Future Water Use

At present, Holloman AFB receives approximately 50 percent of its freshwater supply from the Boles Well Field. An additional freshwater resource for Holloman AFB, and for the city of Alamogordo, is Bonito Lake, located 60 miles northeast of the Tularosa Basin. Currently, there are no potable supplies of groundwater or surface water located on the base because of poor groundwater quality with TDS concentrations greater than 10,000 mg/L.

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3.0 SOURCE CHARACTERIZATION

This section presents the overall technical approach in general accordance with the *RFI Work Plan* (USACE, 2010) (except where otherwise noted) and details the investigative and remediation activities that were implemented at Building 1199.

The primary environmental media of concern at Building 1199 are soil and groundwater. The extent of contamination in soil was expected to be relatively local to the abandoned septic tank location. Therefore, the basic approach was to identify the former septic tank location and then sample at the individual features of the septic tank system in characterizing the soil. To evaluate the potential impacts to groundwater, a monitoring well was installed in the downgradient end of the leach field. The analytical programs for both soil and groundwater focused on the expected nature of contamination likely to be associated with septic tank discharges.

The RFI conducted at abandoned septic tank OT-C536 (Building 1199) was initiated as part of the Midwestern Region Performance-Based Remediation Contract. The *RFI Work Plan* (USACE, 2010) for this site included the following field work activities: pre-mobilization and mobilization/site setup activities, soil boring advancement, soil sample collection, monitoring well installation and development, groundwater sample collection, sample analysis, investigation-derived waste (IDW) management, and land surveying. Appendix B provides a photographic log of Building 1199 activities, from the initial site layout to direct push technology (DPT) soil sampling and monitoring well installation.

3.1 Pre-mobilization/Mobilization Activities

Several pre-investigation documents were filed and approvals obtained, as follows:

- Civil Engineer Work Request (Air Force Form 332) approval
- Base digging permits (Air Force Form 103, Base Civil Engineering Work Clearance Request) with utility clearances
- Site security clearances
- Facility manager notification of the intended operations.

Before the start of activities, a pre-investigation kick-off meeting and site walk-through were conducted with the Air Force Civil Engineer Center resident engineer, Holloman AFB personnel, and Shaw's Construction Manager, to plan for equipment access, equipment staging, decontamination area layout, potential site hazards, emergency evacuation routes, and project schedule.

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Prior to the submittal of the base digging permits, the drilling locations were delineated using marker flags, stakes, and paint. Utility clearance approvals were completed by the appropriate Holloman AFB utility office (i.e., telephone, sewer, water, natural gas, etc.), and by the New Mexico One Call utility clearance system. Upon receipt of the approved digging permit and utility clearances, Shaw's Construction Manager completed a site walk-through to confirm the utility and intrusive work locations. In addition, Shaw performed a site survey prior to the start of drilling activities to search for signs of other buried or overhead utilities.

3.2 Geophysical Investigation

A geophysical investigation was performed at former Building 1199 in an attempt to define the limits of the abandoned septic system. Methods employed included: visual inspection, electromagnetic induction conductivity detection, ground-penetrating radar (GPR), and electromagnetic pipe and cable location.

Electromagnetic induction conductivity detection ground induction methods are employed to detect broad metal mass anomalies or conductive zones that may be indicative of potential septic tanks, and lateral changes in conductive zones of soil or backfill materials relative to native soil. GPR is used to detect abandoned septic tank excavation sidewalls and fill areas. An electromagnetic pipe and cable survey was conducted to detect buried utility lines.

Electromagnetic and GPR surveys were conducted at former Building 1199 in June 2012. The location of the abandoned septic tank and leach field were identified, approximately 60 ft south of former Building 1199. The locations of the individual leach field piping could not be directly detected by the geophysical survey due to the similarity of composition of the clay pipes and the surrounding soil. However, the leach field could be identified by the geophysical survey equipment due to the differences in mineralization and conductivity between the native soil and the soils that were physically affected by normal leach field operation. The presence of the leach field piping was assumed within the leach field as identified by the geophysical survey which allowed for representative soil and groundwater sample collection. No buried utility lines were identified. Geophysical findings are shown on Figure 3-1. The complete geophysical report is included in Appendix C.

3.3 Soil Investigation

The soil investigation of the abandoned septic tank at Building 1199 was conducted on June 21 and 22, 2012. The program consisted of sampling four borings advanced at the abandoned septic tank location, as shown on Figure 3-1. Soil boring OT-C536-Station 1 (sample numbers OTC536-IS-0001-062112 and OTC536-IS-0002-062112) was placed north of the abandoned septic tank along the influent line, OT-C536-Station 2 (sample numbers OTC536-IS-0003-062212, OTC536-IS-0004-062212-FD, and OTC536-IS-0005-062212)

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was placed at the abandoned septic tank location, OT-C536-Station 3 (samples numbers OTC536-IS-0006-062212 and OTC536-IS-0007-062212) was placed south of the abandoned septic tank near the effluent line, and OT-C536-Station 4 (sample numbers OTC536-IS-0008-062212, OTC536-IS-0009-062212, OTC536-IS-0010-062212, and OTC536-IS-0011-062212) was placed in the leach field of the abandoned septic tank. All borings were advanced using DPT, with soil samples collected at depths of 3 to 5 ft and 10 to 12 ft at OT-C536-Station 1; and 7 to 9 ft and 14 to 16 ft at OT-C536-Station 2; 3 to 5 ft and 10 to 12 ft at OT-C536-Station 3; and 0 to 2, 3 to 5 ft, 10 to 12, and 28 to 30 ft at OT-C536-Station 4 (Appendix D contains copies of the sample collection logs). A field duplicate was collected from the 7 to 9 ft depth at OT-C536-Station 2.

Soil samples were logged in the field in accordance with the Unified Soil Classification System requirements, and sample depths were in general accordance with the *RFI Work Plan* (USACE, 2010). Soil samples were not screened with a photoionization detector since there was no sensory evidence of contamination. Appendix E has copies of the soil boring logs.

Soil samples for volatile organic compound (VOC) analysis were collected in accordance with EPA Method 5035, using a TerraCore® Sampler device (EPA, 1986), while non-VOC sample aliquots were placed in laboratory-provided containers. Samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), explosives, polychlorinated biphenyls (PCBs), target analyte list (TAL) metals, total petroleum hydrocarbons (TPH)-gasoline range organics (GRO), TPH-diesel range organics (DRO), TPH-oil range organics (ORO), cyanide, percent solids, and tritium by Accutest Laboratories, Inc., a National Environmental Laboratory Accreditation Program-accredited laboratory, using EPA analytical methods, as summarized on Table 3-1.

The excess sample core soil extracted using the DPT drilling method was placed in 55-gallon drums for later characterization and transport to a licensed disposal facility. The boreholes were abandoned upon completion by plugging from the bottom of the borehole to ground surface using bentonite pellets, and then covered with gravel to match the surrounding land surface contour. Soil boring equipment was decontaminated between borings as detailed in Holloman AFB Standard Operating Procedure 2, “Sampling Equipment Decontamination” as provided in Appendix B of the *RFI Work Plan* (USACE, 2010) and Shaw’s Standard Operating Procedure No. EI-FS-014, “Decontamination of Contact Sampling Equipment.”

3.4 Groundwater Investigation

One monitoring well was installed at the Building 1199 to determine any impacts to groundwater. Well OTC536-MW01 was installed in the leach field, approximately 25 ft south of the abandoned septic tank location, as shown on Figure 3-1.

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The monitoring well was installed using hollow-stem auger drilling techniques in accordance with NMED Ground Water Quality Bureau *Monitoring Well Construction and Abandonment Guidelines* (NMED, 2011). The 10-inch borehole was advanced approximately 4 ft into the water table approximately 23 ft bgs and completed such that the top of the well screens were set above the approximate level of the groundwater observed during drilling. The monitoring well was constructed of 2-inch-diameter Schedule-40 polyvinyl chloride riser with 2-inch diameter, Schedule-40 polyvinyl chloride screen fitted with pre-packed, very fine stainless-steel meshing (Appendix F). The screened section of the well was 5 ft long (as opposed to the stipulated 10 ft in the Work Plan; the variance is based on observed lithology). A silica sand filter pack was placed around the screen to approximately 3 ft above the top of the screen, with a 2-ft thick bentonite seal placed above the filter pack. The remaining annular space was grouted with cement and bentonite.

The monitoring well was constructed as a "flush-mount" surface completion with a water-tight well vault, locking, expandable well plug, and finished to surrounding grade. Table 3-2 and Appendix F provide monitoring well construction details.

The newly-installed monitoring well was developed to create an effective filter pack around the well screen, remove fine particles from the formation near the borehole, and assist in restoring the natural water quality of the aquifer in the vicinity of the well. Development occurred four days after installation to allow for grout curing. Surging and pumping were both employed to achieve the most effective well development.

Information recorded during well development included water-level measurements, depth-to-bottom measurements, water-quality parameters (pH, temperature, and specific conductance), discharge-water color, water volume, and time period. Well development was performed until the following criteria were met:

- Water removed from the well was visually clear, and the turbidity measures were less than or equal to 10 nephelometric turbidity units.
- The pH, temperature, and specific conductance parameters were stabilized (less than 10 percent variation for three successive readings).

Groundwater sampling was conducted at OTC536-MW01 on July 4, 2012 using low-flow sampling techniques. Water quality indicator parameters were measured and recorded during purging of the monitoring wells (Appendix G) using a field-calibrated water quality meter. Table 3-3 contains final water quality readings from the sampling event. Groundwater samples were collected once indicator parameters had stabilized, and analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium by Accutest Laboratories, Inc.

3.5 Investigation-Derived Waste

The nonhazardous IDW generated during the Building 1199 RFI were segregated into the following categories:

- Soil – drill cuttings soil
- Water – decontamination liquids and purge water.

Upon generation, investigation-derived waste was properly containerized and temporarily stored at the designated laydown yard, as specified by Holloman AFB. Wastes were contained in sealed, U.S. Department of Transportation–approved, steel 55-gallon drums (for soil cuttings and decontamination water), roll-off containers with liners and covers (for excavated waste soil), and a 1,400-gallon plastic tank (for waste water). The waste soil drums were emptied into 20-cubic yard roll-off containers, and the waste water was pumped into a bulk plastic tank prior to characterization sampling and analysis for disposal. The drill cuttings from the Building 1199 Site were placed into the 20-cubic yard roll-off containers along with soils from other Holloman AFB investigation sites.

3.6 Site Surveying

Soil borings, the monitoring well, and other site features shown on Figure 3-1 were surveyed by Albuquerque Surveying Company, Inc. from Albuquerque, New Mexico, a state-licensed surveyor.

Horizontal coordinates are referenced to the North American Datum 1983 State Plane Coordinate System, New Mexico-Central, and surveyed to an accuracy of $\pm$1.0 ft. Vertical elevations are referenced to the North American Vertical Datum 1988 coordinate system to an accuracy of $\pm$0.01 ft. A copy of the survey results is presented in Appendix H.

3.7 Decontamination Procedures

A decontamination pad was constructed at the designated laydown area for decontamination of all downhole drilling equipment. The drilling rig was decontaminated prior to entering the site. Drilling equipment that came into contact with the borehole was decontaminated by hot-water pressure washing. Disposable equipment used for soil sample collection did not require decontamination.

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4.0 INVESTIGATION RESULTS AND EVALUATION

Soil analytical results presented in this section were used to delineate constituents of concern that may have been released to the environment, and confirm that no additional remedial measures are required.

4.1 Soil Analytical Results

DPT soil boring samples and post-excavation confirmation samples were collected during the Building 1199 RFI, at the locations shown on Figure 3-1. All soil samples were sent to Accutest Laboratories, Inc., for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium analyses. Analytical results for the soil samples are presented in Table 4-1. Laboratory analytical data packages, and the data validation checklists for the soil sample data, are provided in Appendix I.

The analytical results for metals in Table 4-1 show that Holloman AFB soil samples contain significant amounts of calcium, typically greater than 100,000 milligrams per kilogram (mg/kg) (10 percent), and can be as high as 250,000 mg/kg (25 percent). Calcium at these levels contributes spectral interferences during inductively-coupled plasma metals analysis, and can also clog the nebulizer that is used to introduce the sample. Sample dilution is the recommended method for solving both the spectral interference issue and the nebulizer clogging issue. However, sample dilution raises the analytical method detection limits (MDLs) for all associated metals, including thallium.

A typical method detection limit for thallium during inductively-coupled plasma analysis is 0.13 mg/kg. Diluting by a factor of 5 to 20 to eliminate calcium spectral interference and nebulizer clogging causes the thallium detection limit to be elevated by a factor of 5 to 20. This results in a MDL that is above the NMED residential SSL of 0.782 mg/kg thallium. Consequently, the required remedy to allow for proper equipment operation resulted in MDLs that were above the NMED residential SSL. However, thallium is not an element that is anticipated to be present at Building 1199 as a result of normal septic tank operation and maintenance.

The validated soil analytical results were compared with the NMED residential SSLs (NMED, 2012), or the EPA RSLs (EPA, 2012a), if an NMED residential SSL was not established for a given analyte. In addition, a TPH screening level of 1,000 mg/kg was used to evaluate the laboratory analytical data. The 1,000 mg/kg action level for petroleum-contaminated soil is the Residential Direct Exposure Limit for unknown oil, listed in Table 6-2, TPH Screening Guidelines for Potable Groundwater, of the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a).

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The arsenic detection in USTC536-IS-0009-062212 (OT-C536-Station 4, 10 to 12 ft bgs) exceeded the NMED residential SSL; however, this exceedance is considered to be the result of natural processes as discussed below in Section 4.4. No other parameters had detections above the NMED residential SSL screening criteria in sample USTC536-IS-0009-062212, and all other samples met the NMED SSL criteria for all analytes. Likewise, all soil samples from all locations and depths had TPH-GRO, TPH-DRO, and TPH-ORO concentrations below the TPH screening level, and no tritium was detected in any of the soil samples.

Sample OTC536-IS-0007-062212, collected from OT-C536 Station 3 in the 10 to 12 ft bgs interval, had a magnesium concentration (18,600 mg/kg) above the Holloman soil background value of 16,991 mg/kg. All other parameters were below the background values.

4.2 Groundwater Analytical Results

One monitoring well, OTC536-MW01 was installed during the septic tank investigation, as shown on Figure 3-1. Groundwater from well OTC536-MW01 was analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium by Accutest Laboratories, Inc. Detections were compared to the NMWQCC water quality standards and EPA drinking water MCLs. The Building 1199 groundwater sample had a TDS value below 10,000 mg/L.

Analytical results for the Building 1199 groundwater samples are shown in Table 4-2. All analytical parameter concentrations were below the NMWQCC water quality standards and EPA drinking water MCLs.

4.3 Investigation-Derived Waste Analytical Results

A bulk waste characterization sample (LDY-IDW-01-090412) was collected from the bulk waste soil and analyzed for Toxicity Characteristic Leaching Procedure VOCs, SVOCs, and RCRA metals. The results are presented in Table 4-3. None of the waste soil analytical results were above the 40 Code of Federal Regulations Part 261.24 limits. The waste soil was managed as nonhazardous waste and was subsequently transported to Otero/Greentree Regional Landfill, Alamogordo, New Mexico for disposal (Waste Manifest in Appendix J).

The wastewater from equipment decontamination was sampled and analyzed for VOCs, SVOCs, TAL metals, TPH-GRO, TPH-DRO, and TPH-ORO, with the analytical results presented in Table 4-4. The analytical results were reviewed by the Holloman AFB wastewater treatment plant personnel, and subsequently accepted for disposal.

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4.4 Geochemical Evaluation of Arsenic in Soil

4.4.1 Introduction

This section summarizes the geochemical evaluation of arsenic concentrations in soil from the Building 1199 site at Holloman Air Force Base (Appendix K contains the detailed evaluation). The 11 soil samples considered in this evaluation were obtained in June, 2012 at several depth intervals ranging from 0 to 2 ft to 28 to 30 ft bgs. All of the samples were analyzed for the full suite of 23 TAL metals. Arsenic is evaluated here because the NMED residential SSL of 3.9 mg/kg for arsenic was slightly exceeded in sample OTC536-IS-0009-062212 (10-12 ft bgs) at a concentration of 4.2 mg/kg.

Analyses of 42 background subsurface samples were used for comparison in the evaluation. These background samples were obtained from depths of 7 to 30 ft bgs at intervals that were above the water table. Descriptions of the background samples can be found in the *Basewide Background Study Report for Holloman Air Force Base* (Nation View-Bhate, 2009).

4.4.2 Geochemical Evaluation Results

Aluminum and iron are evaluated first to verify that the iron concentrations are natural and that they are, therefore, suitable for use as reference elements for the evaluation of arsenic.

4.4.2.1 Aluminum and Iron

Aluminum has a mean concentration of 6,300 mg/kg in the 11 site samples. Aluminum is a primary component of common soil-forming minerals such as clays, feldspars, and micas. Aluminum is always trivalent (as Al^{3+}) and can substitute for ferric iron (Fe^{3+}) in iron oxide minerals. It can also adsorb on iron oxide surfaces (Cornell and Schwertmann, 2003).

Iron has a mean concentration of 6,000 mg/kg in the site samples, and is dominantly present as iron oxides. Iron oxides are common soil-forming minerals and occur as discrete mineral grains or as coatings on silicate minerals (Cornell and Schwertmann, 2003).

Clays and iron oxides tend to exist as very fine particles, so both aluminum (a proxy for clay content) and iron (a proxy for iron oxide content) are enriched in samples with finer grain sizes. The geochemical evaluation indicated that the site and background samples have similar Fe/Al ratios. It also showed that the site samples do not contain excess aluminum or iron from a contaminant source, and that their aluminum and iron concentrations are natural.

Iron is used as the reference element for arsenic so these results also indicate that the observed iron concentrations are suitable for use in evaluating the arsenic source in the site samples. Clays and iron oxides have an affinity to adsorb specific trace elements, so as a result, samples that are enriched in these minerals are expected to contain naturally high concentrations of trace elements, including arsenic.

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4.4.2.2 Arsenic

Arsenic is known to associate with iron oxide minerals, as discussed in Appendix K. A soil sample that is naturally enriched in iron oxides is expected to be naturally enriched in arsenic. A ratio plot of the arsenic and iron results (provided in Appendix K) reveals that the Building 1199 samples have As/Fe ratios that fall within the range of the background ratios. The consistent As/Fe ratios in the site samples, and the agreement with the background ratios indicates that the observed arsenic concentrations are most likely natural. Appendix K contains the detailed geochemical evaluation.

4.5 Risk-Based Evaluation

4.5.1 Soil

Eleven soil samples were collected at Building 1199, from depths of 0 to 30 ft bgs, during the abandoned septic tank investigation. Per NMED (2012a), the soil depths of interest for a risk evaluation are 0 to 10 ft bgs for construction workers and residential receptors, and 0 to 1 ft bgs for commercial/industrial workers. Therefore, results from the screening assessment (Table 4-1) that present data for 0 to 10 ft bgs were used for the Risk Evaluation. Based on the results of the initial screening evaluation for 0 to 10 ft bgs soils, no constituents of potential concern (COPC) have a concentration greater than: (1) NMED residential SSLs or EPA residential RSLs (if NMED values have not been established), or (2) the Holloman AFB soil background values. Total cancer risk ratios and total hazard ratios (hazard index [HI]) to address potential additive toxicological effects were also assessed (per NMED 2012a, Section 5.0). This was conducted by using maximum detected concentrations of carcinogens and non-carcinogens, estimating risk and hazard ratios, and scaling a total cancer risk and total HI. The total cancer risk did not exceed 1.0×10^{-5} (total cancer risk: 3.1×10^{-6}), as shown in Appendix L. The total HI based on maximum detected concentrations was equal to 0.29 (Appendix L). As the target HI is 1.0, this is acceptable because the HI does not exceed 1.0.

Arsenic was detected in one sample at a concentration (4.2 mg/kg) that exceeded the NMED soil screening value (3.9 mg/kg), but the sample was collected at a depth of 10 to 12 ft bgs. Two shallower, co-located samples collected at depths of 0 to 2 ft bgs and 3 to 5 ft bgs had arsenic concentrations below the screening value. Furthermore, arsenic in soil is considered to be naturally occurring as discussed in Section 4.4 above.

Therefore, there are no constituents of potential concern (COPC) in soil, and future residential, current and/or future commercial/industrial worker, and current and/or future construction worker exposure scenarios are not health risks.

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4.5.2 Groundwater

One groundwater sample was collected from the Building 1199 monitoring well OTC536-MW01 on July 4, 2012. Based on the results of the screening evaluation (see Table 4-2), no chemicals have concentrations greater than NMWQCC WQS or EPA drinking water MCLs.

Therefore, as no chemicals in groundwater were selected, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not health risks.

4.5.3 Risk-Based Conclusions

No COPCs were selected in soil or groundwater; therefore, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure are not health risks. Additionally, total cancer risks and non-cancer hazards in soil were acceptable.

4.6 Ecological Evaluation

The septic system at former Building 1199 was located in a graveled, flat-lying area that served as the parking lot for the former building and is now sparsely vegetated; however, the immediate surrounding area is moderately vegetated, as shown in the photographic log in Appendix B. A screening-level ecological risk assessment (SLERA) Scoping Assessment Site Assessment Checklist was completed for the Building 1199 (OT-C536) septic tank system and is included in Appendix M. Results of the checklist Exclusion Criteria Decision Tree indicate that the site is a potential viable ecological habitat and a potential exposure pathway exists for soil. Therefore, a SLERA was performed.

Soil data results from 0 to 10 ft bgs were included in the comparison and are provided on Table A of Appendix M. According to NMED (2012c), this is the potential depth of interest for wildlife, including burrowing animals. As shown on Table A (Appendix M), six soil samples were available within the 0 to 10 ft bgs zone. Detected constituents in soil included 16 metals and petroleum hydrocarbons (both diesel and oil range organics). All other constituents analyzed for were non-detected.

Metals concentrations were compared to Holloman AFB soil background values (Table A, Appendix M). Detected concentrations of metals did not exceed Holloman AFB soil background values in any soil samples evaluated. Therefore, no further evaluation was performed for metals.

Detected concentrations of petroleum hydrocarbons in soil data collected at the site were compared to the lowest available ecological screening levels (ESLs) presented in the Los

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Alamos National Laboratory (LANL) Eco Risk Database version 3.1 (LANL, 2012). However, no ESLs are available for petroleum hydrocarbons from LANL (2012).

Since all detected site concentrations for metals are below their respective background screening values, it is concluded that risks to the ecological system at and surrounding the site are acceptable.

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5.0 DATA QUALITY ASSURANCE AND DATA QUALITY CONTROL REVIEW

All analytical data was reviewed in accordance with EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA, 2004a) and the EPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (EPA, 2004b). Data qualifiers were added to the database prior to project use. The data tables provided in Section 4.0 show the data qualifiers added during data validation. Detailed data validation checklists for each data deliverable are provided in Appendix I.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary and Conclusions

6.1.1 Soil

Eleven soil samples were collected at various Holloman AFB Building 1199 locations during the abandoned septic tank investigation. The samples were analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium. Validated analytical results were compared with the NMED Residential SSLs, the NMED Residential Direct Exposure Limit for soil contaminated with unknown petroleum oil, and the Holloman AFB soil background values. No soil samples from the 0 to 10 ft bgs zone had constituent concentrations that exceeded the New Mexico residential SSLs or the Holloman AFB soil background values.

The only parameter that exceeded the New Mexico residential SSL was arsenic in one sample, at a depth of 10 to 12 ft bgs, where human health exposure is not expected. Two shallower, co-located samples had arsenic concentrations below the screening value. In addition, a geochemical evaluation of the arsenic results indicated that they are most likely naturally occurring. No TPH was detected above 1,000 mg/kg and no tritium was detected in any of the soil samples from any depth or location. The ecological evaluation concluded that potential risks to the ecological system at and surrounding the site are acceptable.

6.1.2 Groundwater

One groundwater sample was collected from the Building 1199 monitoring well OTC536-MW01. The sample was analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium. No parameters had concentrations greater than the NMWQCC water quality standards or the EPA drinking water MCLs.

Risk-based health screening identified no COPCs in groundwater.

6.2 Recommendations

6.2.1 Soil

No COPCs were detected in soil above the NMED residential SSLs and no unacceptable ecological risk was identified for the site and its surroundings. Therefore, no additional corrective action is recommended for soil at Building 1199.

6.2.2 Groundwater

No COPCs were detected in groundwater above the NMWQCC WQS or EPA drinking water MCLs. Therefore, no corrective action is recommended for groundwater at Building 1199.

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Tables

Table 3-1
Sample Summary
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Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C536-Station 1	682745.9934	1686040.7852	6/21/2012	Investigation Soil	3 - 5	OTC536-IS-0001-062112	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/21/2012	Investigation Soil	10 - 12	OTC536-IS-002-062112	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OT-C536-Station 2	682727.2639	1686046.1076	6/22/2012	Investigation Soil	7 - 9	OTC536-IS-0003-062212	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/22/2012	Investigation Soil - Field Duplicate	7 - 9	OTC536-IS-0004-062212-FD	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C536-Station 2	682727.2639	1686046.1076	6/22/2012	Investigation Soil	14 - 16	OTC536-IS-0005-062212	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OT-C536-Station 3	682716.1511	1686042.0428	6/22/2012	Investigation Soil	3 - 5	OTC536-IS-0006-062212	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/22/2012	Investigation Soil	10 - 12	OTC536-IS-0007-062212	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OTC536-MW01 (OT-C536-Station 4)	682702.1222	1686045.4628	6/22/2012	Investigation Soil	3 - 5	OTC536-IS-0008-062212	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OTC536-MW01 (OT-C536-Station 4)	682702.1222	1686045.4628	6/22/2012	Investigation Soil	10 - 12	OTC536-IS-0009-062212	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/22/2012	Investigation Soil	0 - 2	OTC536-IS-0010-062212	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/22/2012	Investigation Soil	28 - 30	OTC536-IS-0011-062212	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/4/2012	Groundwater	NA	OTC536-GW-5361-070412	TDS	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

[a] Coordinates are referenced to the North American Datum, 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] EPA, 2007, Test Methods for Evaluating Soil Waste Physical/Chemical Methods, EPA Publication SW-846, Final Update IV. Available online at www.epa.gov/osw/hazard/testmethods/sw846.

Percent Solids and Total Dissolved Solids from *Standard Methods for the Examination of Water and Wastewater* , 19th edition, 1995.

bgs	Below ground surface.
DRO	Diesel range organics.
EPA	Environmental Protection Agency
FD	Field Duplicate.
ft	Feet/foot.
GRO	Gasoline range organics.
GW	Groundwater.
IS	Investigation Soil.
MW	Monitoring Well.
NA	Not Applicable.
ORO	Oil range organics.
PCB	Polychlorinated Biphenyl.
RCRA	Resource Conservation Recovery Act.
RFI	RCRA Facility Investigation
STA	Station.
SVOC	Semivolatile organic compound.
TAL	Target analyte list.
TDS	Total Dissolved Solids.
TPH	Total petroleum hydrocarbons.
VOC	Volatile organic compound.

Table 3-2
Monitoring Well Construction Details and Groundwater Elevation Data
Building 1199 (OT-C536)
Holloman Air Force Base, New Mexico

Well ID	Monitoring Well Construction Details						Groundwater Elevation Data: 7/4/2012		
	Location Coordinates		Installation Date	Well Diameter (in)	Well Depth at Construction (ft bgs)	Screened Interval (ft bgs)	Top of PVC Riser Pipe Elevation[b] (ft amsl)	Depth to Water (ft below top of PVC riser pipe)	Potentiometric Surface Elevation[b] (ft amsl)
	Grid Northing[a]	Grid Easting[a]							
OTC536-MW01	682702.1222	1686045.4628	6/22/2012	2	32.0	27.0-32.0	4094.03	26.04	4067.99

[a] *Location coordinates are referenced to the North American Datum 1983 State Plane Coordinate System, New Mexico - Central, feet.*

[b] *Elevations are referenced to the North American Vertical Datum of 1988 (NAVD 88).*

ft = feet.

ft amsl = feet above mean sea level.

ft bgs = feet below ground surface

ID = identification.

in = inches.

PVC = polyvinylchloride

Table 3-3
Monitoring Well Purge Water Quality Parameters
Building 1199 (OT-C536)
Holloman Air Force Base, New Mexico

Well ID	Sample Date	Depth to Water (ft below top of PVC riser pipe)	Total Depth (ft below top of PVC riser pipe)	Purge Water Volume (gallons)	Temperature (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	TDS (g/L)
OTC536-MW01	7/4/2012	26.04	35.22	Not recorded	19.59	6.91	3.617	Meter malfunction *	2.29	80.0	2.35

** turbidity exhibited a downward trend prior to dropping below zero.*

°C = degrees Celsius.
DO = dissolved oxygen.
ft = feet
g/L = grams per liter.
ID = identification.
mg/L = milligrams per liter.
mS/cm = millisiemens per centimeter.
mV = millivolts.
NTU = Nephelometric Turbidity Unit.
ORP = oxidation-reduction potential.
PVC = polyvinylchloride
TDS = total dissolved solid.

Table 4-1
Soil Analytical Data
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC536-IS-0001-062112		OTC536-IS-0002-062112		OTC536-IS-0003-062212		OTC536-IS-0004-062212-FD		OTC536-IS-0005-062212		OTC536-IS-0006-062212		OTC536-IS-0007-062212		OTC536-IS-0008-062212		OTC536-IS-0009-062212		OTC536-IS-0010-062212		OTC536-IS-0011-062212	
				Sample Date	6/21/2012		6/21/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		28 - 30	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**81.9**		**83.7**		**81.5**		**84.3**		**90.1**		**84.4**		**82.4**		**85.9**		**85.3**		**84**		**75.2**	
VOLATILES (mg/kg)																										
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0015	U	0.00093	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00089	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0016	U	0.001	U	0.0012	U	0.0013	U	0.0013	U	0.0013	U	0.0011	U	0.0013	U	0.0012	U	0.0012	U	0.00097	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0023	U	0.0014	U	0.0017	U	0.0018	U	0.0019	U	0.0018	U	0.0016	U	0.0018	U	0.0017	U	0.0017	U	0.0014	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0015	U	0.00093	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00089	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0015	U	0.00093	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00089	U
1,1-DICHLOROETHENE	NE	240	449		0.0019	U	0.0012	U	0.0014	U	0.0015	U	0.0016	U	0.0015	U	0.0013	U	0.0015	U	0.0014	U	0.0014	U	0.0011	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0016	U	0.001	U	0.0012	U	0.0013	U	0.0013	U	0.0013	U	0.0011	U	0.0013	U	0.0012	U	0.0012	U	0.00097	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0031	U	0.002	U	0.0023	U	0.0024	U	0.0026	U	0.0025	U	0.0022	U	0.0024	U	0.0023	U	0.0024	U	0.0019	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.0013	U	0.00085	U	0.00098	U	0.0011	U	0.0011	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00081	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0015	U	0.00093	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00089	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.0013	U	0.00085	U	0.00098	U	0.0011	U	0.0011	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00081	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0016	U	0.001	U	0.0012	U	0.0013	U	0.0013	U	0.0013	U	0.0011	U	0.0013	U	0.0012	U	0.0012	U	0.00097	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0016	U	0.001	U	0.0012	U	0.0013	U	0.0013	U	0.0013	U	0.0011	U	0.0013	U	0.0012	U	0.0012	U	0.00097	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0015	U	0.00093	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00089	U
2-HEXANONE	NE	210	NE		0.0073	U	0.0046	U	0.0053	U	0.0057	U	0.0061	U	0.0058	U	0.0052	U	0.0057	U	0.0055	U	0.0055	U	0.0044	U
ACETONE	NE	61000	66600		0.027	U	0.017	U	0.02	U	0.021	U	0.022	U	0.022	U	0.019	U	0.021	U	0.02	U	0.02	U	0.016	U
BENZENE	NE	1.1	15.4		0.002	U	0.0013	U	0.0015	U	0.0016	U	0.0017	U	0.0016	U	0.0014	U	0.0016	U	0.0015	U	0.0015	U	0.0012	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0015	U	0.00093	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00089	U
BROMOFORM	NE	62	616		0.002	U	0.0013	U	0.0015	U	0.0016	U	0.0017	U	0.0016	U	0.0014	U	0.0016	U	0.0015	U	0.0015	U	0.0012	U
BROMOMETHANE	NE	7.3	16.5		0.0027	U	0.0017	U	0.002	U	0.0021	U	0.0022	U	0.0022	U	0.0019	U	0.0021	U	0.002	U	0.002	U	0.0016	U
CARBON DISULFIDE	NE	820	1530		0.0027	U	0.0017	U	0.002	U	0.0021	U	0.0022	U	0.0022	U	0.0019	U	0.0021	U	0.002	U	0.002	U	0.0016	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0024	U	0.0015	U	0.0018	U	0.0019	U	0.002	U	0.0019	U	0.0017	U	0.0019	U	0.0018	U	0.0018	U	0.0015	U
CHLOROBENZENE	NE	290	376		0.0013	U	0.00085	U	0.00098	U	0.0011	U	0.0011	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00081	U
CHLOROETHANE	NE	15000	29800		0.0027	U	0.0017	U	0.002	U	0.0021	U	0.0022	U	0.0022	U	0.0019	U	0.0021	U	0.002	U	0.002	U	0.0016	U
CHLOROFORM	NE	0.29	5.86		0.0016	U	0.001	U	0.0012	U	0.0013	U	0.0013	U	0.0013	U	0.0011	U	0.0013	U	0.0012	U	0.0012	U	0.00097	U
CHLOROMETHANE	NE	120	275		0.0027	U	0.0017	U	0.002	U	0.0021	U	0.0022	U	0.0022	U	0.0019	U	0.0021	U	0.002	U	0.002	U	0.0016	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.002	U	0.0013	U	0.0015	U	0.0016	U	0.0017	U	0.0016	U	0.0014	U	0.0016	U	0.0015	U	0.0015	U	0.0012	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0013	U	0.00085	U	0.00098	U	0.0011	U	0.0011	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00081	U
CYCLOHEXANE	NE	7000	NE		0.0019	U	0.0012	U	0.0014	U	0.0015	U	0.0016	U	0.0015	U	0.0013	U	0.0015	U	0.0014	U	0.0014	U	0.0011	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.0013	U	0.00085	U	0.00098	U	0.0011	U	0.0011	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00081	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.002	U	0.0013	U	0.0015	U	0.0016	U	0.0017	U	0.0016	U	0.0014	U	0.0016	U	0.0015	U	0.0015	U	0.0012	U
ETHYLBENZENE	NE	5.4	68.4		0.0013	U	0.00085	U	0.00098	U	0.0011	U	0.0011	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00081	U
ISOPROPYLBENZENE	NE	2100	2430		0.0015	U	0.00093	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00089	U
METHYL ACETATE	NE	78000	78200		0.017	U	0.011	U	0.012	U	0.013	U	0.014	U	0.014	U	0.012	U	0.013	U	0.013	U	0.013	U	0.01	U
METHYL ETHYL KETONE	NE	28000	37100		0.0082	R	0.0052	R	0.006	U	0.0064	U	0.0069	U	0.0066	U	0.0058	U	0.0064	U	0.0062	U	0.0062	U	0.0049	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0074	U	0.0047	U	0.0054	U	0.0058	U	0.0062	U	0.006	U	0.0053	U	0.0058	U	0.0056	U	0.0056	U	0.0045	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0017	U	0.0011	U	0.0013	U	0.0014	U	0.0015	U	0.0014	U	0.0012	U	0.0014	U	0.0013	U	0.0013	U	0.0011	U
METHYLENE CHLORIDE	NE	56	409		0.0062	U	**0.0039**	J	0.0045	U	0.0049	U	0.0052	U	0.005	U	0.0044	U	0.0048	U	0.0047	U	0.0047	U	0.0037	U

Table 4-1
Soil Analytical Data
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC536-IS-0001-062112		OTC536-IS-0002-062112		OTC536-IS-0003-062212		OTC536-IS-0004-062212-FD		OTC536-IS-0005-062212		OTC536-IS-0006-062212		OTC536-IS-0007-062212		OTC536-IS-0008-062212		OTC536-IS-0009-062212		OTC536-IS-0010-062212		OTC536-IS-0011-062212	
				Sample Date	6/21/2012		6/21/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		28 - 30	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																										
STYRENE	NE	6300	7280		0.0035	U	0.0022	U	0.0026	U	0.0027	U	0.0029	U	0.0028	U	0.0025	U	0.0027	U	0.0026	U	0.0027	U	0.0021	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0027	U	0.0017	U	0.002	U	0.0021	U	0.0022	U	0.0022	U	0.0019	U	0.0021	U	0.002	U	0.002	U	0.0016	U
TETRACHLOROETHYLENE	NE	22	7.02		0.0013	U	0.00085	U	0.00098	U	0.0011	U	0.0011	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00081	U
TOLUENE	NE	5000	5270		0.0016	U	0.001	U	0.0012	U	0.0013	U	0.0013	U	0.0013	U	0.0011	U	0.0013	U	0.0012	U	0.0012	U	0.00097	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.002	U	0.0013	U	0.0015	U	0.0016	U	0.0017	U	0.0016	U	0.0014	U	0.0016	U	0.0015	U	0.0015	U	0.0012	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0015	U	0.00093	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00089	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0016	U	0.001	U	0.0012	U	0.0013	U	0.0013	U	0.0013	U	0.0011	U	0.0013	U	0.0012	U	0.0012	U	0.00097	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0027	U	0.0017	U	0.002	U	0.0021	U	0.0022	U	0.0022	U	0.0019	U	0.0021	U	0.002	U	0.002	U	0.0016	U
VINYL CHLORIDE	NE	0.06	0.728		0.002	U	0.0013	U	0.0015	U	0.0016	U	0.0017	U	0.0016	U	0.0014	U	0.0016	U	0.0015	U	0.0015	U	0.0012	U
XYLENES, TOTAL	NE	630	814		0.0043	U	0.0027	U	0.0031	U	0.0034	U	0.0036	U	0.0035	U	0.0031	U	0.0034	U	0.0032	U	0.0033	U	0.0026	U
SEMIVOLATILES (mg/kg)																										
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
2,4-DICHLOROPHENOL	NE	180	183		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.025	U	0.025	U	0.026	U	0.025	U	0.024	U	0.025	U	0.025	U	0.025	U	0.025	U	0.025	U	0.028	U
2,4-DINITROPHENOL	NE	120	122		0.4	U	0.4	U	0.41	U	0.4	U	0.38	U	0.4	U	0.4	U	0.39	U	0.39	U	0.39	U	0.44	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
2,6-DINITROTOLUENE	NE	61	61.1		0.024	U	0.023	U	0.024	U	0.023	U	0.022	U	0.024	U	0.024	U	0.023	U	0.023	U	0.023	U	0.026	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.04	U	0.039	U	0.039	U	0.039	U	0.044	U
2-CHLOROPHENOL	NE	390	391		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
2-METHYLNAPHTHALENE	NE	230	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
2-METHYLPHENOL	NE	3100	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
2-NITROANILINE	NE	610	NE		0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.04	U	0.039	U	0.039	U	0.039	U	0.044	U
2-NITROPHENOL	NE	NE	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.04	U	0.039	U	0.039	U	0.039	U	0.044	U
3-NITROANILINE	NE	NE	NE		0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.04	U	0.039	U	0.039	U	0.039	U	0.044	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.081	U	0.08	U	0.081	U	0.08	U	0.075	U	0.08	U	0.081	U	0.079	U	0.079	U	0.078	U	0.089	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
4-CHLOROANILINE	NE	2.4	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
4-NITROANILINE	NE	24	NE		0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.04	U	0.039	U	0.039	U	0.039	U	0.044	U
4-NITROPHENOL	NE	NE	NE		0.16	UJ	0.16	U	0.16	U	0.16	U	0.15	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.18	U
ACENAPHTHENE	NE	3400	3440		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
ACENAPHTHYLENE	NE	NE	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
ACETOPHENONE	NE	7800	7820		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
ANTHRACENE	NE	17000	17200		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
ATRAZINE	NE	2.1	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U

Table 4-1
Soil Analytical Data
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC536-IS-0001-062112		OTC536-IS-0002-062112		OTC536-IS-0003-062212		OTC536-IS-0004-062212-FD		OTC536-IS-0005-062212		OTC536-IS-0006-062212		OTC536-IS-0007-062212		OTC536-IS-0008-062212		OTC536-IS-0009-062212		OTC536-IS-0010-062212		OTC536-IS-0011-062212	
				Sample Date	6/21/2012		6/21/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		28 - 30	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																										
BENZALDEHYDE	NE	7800	NE		0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.22	U
BENZO(A)ANTHRACENE	NE	0.15	1.48		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
BENZO(A)PYRENE	NE	0.015	0.148		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
BENZO(G,H,I)PERYLENE	NE	NE	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
BENZYL BUTYL PHTHALATE	NE	260	NE		0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.04	U	0.039	U	0.039	U	0.039	U	0.044	U
BIPHENYL	NE	51	57.1		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347		0.081	U	0.08	U	0.081	U	0.08	U	0.075	U	0.08	U	0.081	U	0.079	U	0.079	U	0.078	U	0.089	U
CAPROLACTAM	NE	31000	NE		0.064	U	0.064	U	0.065	U	0.064	U	0.06	U	0.064	U	0.065	U	0.063	U	0.063	U	0.062	U	0.071	U
CARBAZOLE	NE	NE	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
CHRYSENE	NE	15	148		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
DIBENZOFURAN	NE	78	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
DIETHYL PHTHALATE	NE	49000	48900		0.081	U	0.08	U	0.081	U	0.08	U	0.075	U	0.08	U	0.081	U	0.079	U	0.079	U	0.078	U	0.089	U
DIMETHYL PHTHALATE	NE	611000	611000		0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.2	U	0.039	U	0.039	U	0.039	U	0.044	U
DI-N-BUTYL PHTHALATE	NE	6100	6110		0.081	U	0.08	U	0.081	U	0.08	U	0.075	U	0.08	U	0.02	U	0.079	U	0.079	U	0.078	U	0.089	U
DI-N-OCTYLPHTHALATE	NE	730	NE		0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.02	U	0.039	U	0.039	U	0.039	U	0.044	U
FLUORANTHENE	NE	2300	2290		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
FLUORENE	NE	2300	2290		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
HEXACHLOROBENZENE	NE	0.3	3.04		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
HEXACHLOROBUTADIENE	NE	6.2	61.1		0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.04	U	0.039	U	0.039	U	0.039	U	0.044	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367		0.089	U	0.088	U	0.089	U	0.088	U	0.083	U	0.088	U	0.02	U	0.087	U	0.087	U	0.086	U	0.098	U
HEXACHLOROETHANE	NE	12	42.8		0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.02	U	0.039	U	0.039	U	0.039	U	0.044	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
ISOPHORONE	NE	510	5120		0.02	UJ	0.02	UJ	0.02	U	0.02	U	0.019	U	0.02	UJ	0.081	U	0.02	U	0.02	U	0.02	U	0.022	U
M,P-CRESOL	NE	NE	NE		0.029	U	0.029	U	0.029	U	0.029	U	0.027	U	0.029	U	0.065	U	0.028	U	0.028	U	0.028	U	0.032	U
NAPHTHALENE	NE	3.6	43.0		0.032	U	0.032	U	0.033	U	0.032	U	0.03	U	0.032	U	0.02	U	0.031	U	0.031	U	0.031	U	0.036	U
NITROBENZENE	NE	4.8	53.5		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
N-NITROSODIPHENYLAMINE	NE	99	993		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
PENTACHLOROPHENOL	NE	0.89	8.94		0.24	U	0.24	U	0.24	U	0.24	U	0.23	U	0.24	U	0.081	U	0.24	U	0.24	U	0.23	U	0.27	U
PHENANTHRENE	NE	1830	1830		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
PHENOL	NE	18000	18300		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
PYRENE	NE	1700	1720		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U

Table 4-1
Soil Analytical Data
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC536-IS-0001-062112		OTC536-IS-0002-062112		OTC536-IS-0003-062212		OTC536-IS-0004-062212-FD		OTC536-IS-0005-062212		OTC536-IS-0006-062212		OTC536-IS-0007-062212		OTC536-IS-0008-062212		OTC536-IS-0009-062212		OTC536-IS-0010-062212		OTC536-IS-0011-062212	
				Sample Date	6/21/2012		6/21/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		28 - 30	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																									
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.074	U	0.075	U	0.069	U	0.073	U	0.066	U	0.067	U	0.057	U	0.068	U	0.061	U	0.078	U	0.07	U
1,3-DINITROBENZENE	NE	6.10	NE	0.074	U	0.075	U	0.069	U	0.073	U	0.066	U	0.067	U	0.057	U	0.068	U	0.061	U	0.078	U	0.07	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.074	U	0.075	U	0.069	U	0.073	U	0.066	U	0.067	U	0.057	U	0.068	U	0.061	U	0.078	U	0.07	U
2,4-DINITROTOLUENE	NE	1.60	15.7	0.089	U	0.091	U	0.084	U	0.088	U	0.08	U	0.081	U	0.069	U	0.083	U	0.074	U	0.094	U	0.085	U
2,6-DINITROTOLUENE	NE	61.0	61.1	0.08	U	0.082	U	0.075	U	0.079	U	0.072	U	0.072	U	0.062	U	0.074	U	0.067	U	0.084	U	0.076	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.074	U	0.075	U	0.069	U	0.073	U	0.066	U	0.067	U	0.057	U	0.068	U	0.061	U	0.078	U	0.07	U
2-NITROTOLUENE	NE	2.90	29.1	0.074	U	0.075	U	0.069	U	0.073	U	0.066	U	0.067	U	0.057	U	0.068	U	0.061	U	0.078	U	0.07	U
3-NITROTOLUENE	NE	6.10	7.82	0.074	U	0.075	U	0.069	U	0.073	U	0.066	U	0.067	U	0.057	U	0.068	U	0.061	U	0.078	U	0.07	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.074	U	0.075	U	0.069	U	0.073	U	0.066	U	0.067	U	0.057	U	0.068	U	0.061	U	0.078	U	0.07	U
4-NITROTOLUENE	NE	30.0	244.4	0.093	U	0.095	U	0.087	U	0.092	U	0.084	U	0.084	U	0.072	U	0.086	U	0.077	U	0.098	U	0.089	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.18	U	0.19	U	0.17	U	0.18	U	0.17	U	0.17	U	0.14	U	0.17	U	0.15	U	0.19	U	0.18	U
NITROBENZENE	NE	4.80	53.5	0.086	U	0.087	U	0.081	U	0.085	U	0.077	U	0.077	U	0.066	U	0.079	U	0.071	U	0.09	U	0.082	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.074	U	0.075	U	0.069	U	0.073	U	0.066	U	0.067	U	0.057	U	0.068	U	0.061	U	0.078	U	0.07	U
TETRYL	NE	240.0	244.0	0.074	U	0.075	U	0.069	U	0.073	U	0.066	U	0.067	U	0.057	U	0.068	U	0.061	U	0.078	U	0.07	U
METALS (mg/kg)																									
ALUMINUM	13722	77000	78000	**3130**		**6380**		**4680**		**4070**		**7690**		**2640**	J	**11900**		**5540**		**9920**		**3020**		**10500**	
ANTIMONY	1.6	31	31.3	1.2	U	1	U	1.6	U	1.6	U	0.99	U	0.99	UJ	1.1	U	1	U	1.6	U	0.9	U	**1.4**	J
ARSENIC	3.7	0.39	3.90	1.2	U	**1.5**	J	0.8	U	0.78	U	**3.1**	J	0.99	U	**3.5**	J	**1.2**	J	**4.2**		0.9	U	**3.3**	J
BARIUM	169.3	15000	15600	**42.9**	J	**84.2**	J	**72.8**	J	**38.6**	J	**81**	J	**26.1**	J	**106**	J	**47.1**	J	**97.1**		**36.2**	J	**57.3**	J
BERYLLIUM	1.6	160	156	0.58	U	0.52	U	0.4	U	0.39	U	0.5	U	0.49	U	**0.72**	J	0.52	U	**0.54**	J	0.45	U	0.51	U
CADMIUM	0.3	70	70.3	0.58	U	0.52	U	0.8	U	0.78	U	0.5	U	0.49	UJ	0.55	U	0.52	U	0.8	U	0.45	U	0.51	U
CALCIUM	317332	NE	NE	**208000**		**199000**		**260000**		**219000**		**123000**		**222000**	J	**227000**		**202000**		**209000**		**211000**		**260000**	
CHROMIUM[d]	25	117000	117000	**2.5**	J	**6.4**		**4.2**	J	**4.2**	J	**11.2**		**2.2**	J	**12.8**		**4.8**	J	**9.6**		**2.5**	J	**12.7**	
COBALT	7.7	23	NE	**1.3**	J	**2**	J	**1.5**	J	**1.3**	J	**3.6**	J	**0.9**	J	**4.4**	J	**1.8**	J	**3.7**	J	**1.2**	J	**5.7**	J
COPPER	13	3100	3130	**2.2**	J	**3.1**	J	**2**	J	**1.9**	J	**6.4**	J	**1.2**	J	**7**	J	**2.8**	J	**6.3**	J	**2.1**	J	**11.3**	J
IRON	23049	55000	54800	**2460**		**7050**		**4400**		**3780**		**8760**		**2410**		**10700**		**4660**		**9140**		**2440**		**10400**	
LEAD	10.9	400	400	**0.78**	J	**2.9**	J	**2**	J	0.78	U	**4.5**	J	**1**	J	**7.1**	J	**4**	J	**3.8**	J	**2**	J	**9.3**	J
MAGNESIUM	16991	NE	NE	**3480**		**3750**		**2850**		**2310**		**4720**		**1680**	J	**18600**		**3690**		**8230**		**3480**		**10000**	
MANGANESE	393	1800	1860	**47.5**		**141**		**99.9**		**61.4**		**140**		**31.7**		**88.4**		**82.9**		**170**		**47.2**		**391**	
MERCURY	0.0108	10	15.6	0.0091	U	0.0091	U	0.0094	U	0.0096	U	0.0087	U	0.0094	U	0.0098	U	0.0092	U	0.009	U	0.0094	U	0.011	U
NICKEL	17.4	1500	1560	**2.5**	J	**5.6**	J	**3.4**	J	**3**	J	**7.6**	J	**1.9**	J	**11.8**	J	**4**	J	**10.4**	J	**2.8**	J	**11.9**	J
POTASSIUM	5077	NE	NE	**1080**	J	**1640**	J	**1200**	J	**1080**	J	**1880**	J	**703**	J	**2680**	J	**1500**	J	**2330**	J	**971**	J	**2990**	J
SELENIUM	1.4	390	391	2.3	U	2.1	U	3.2	U	3.1	U	2	U	2	U	2.2	U	2.1	U	3.2	U	1.8	U	2	U
SILVER	1.1	390	391	0.58	U	0.52	U	0.4	U	0.39	U	0.5	U	0.49	U	0.55	U	0.52	U	0.4	U	0.45	U	0.51	U
SODIUM	5196	NE	NE	**856**	J	580	U	440	U	430	U	**655**	J	540	U	610	U	570	U	440	U	**655**	J	560	U
THALLIUM	1.3	0.78	0.782	1.5	U	1.4	U	2.1	U	2	U	1.3	U	1.3	U	1.4	U	1.3	U	2.1	U	1.2	U	1.3	U
VANADIUM	42.6	390	391	**9.2**	J	**16.2**	J	**9.5**	J	**7.3**	J	**21.9**	J	**5.3**	J	**24**	J	**11.8**	J	**23.9**		**8.3**	J	**21.8**	J
ZINC	54.6	23000	23500	**7.5**	J	**13.8**		**7.2**	J	**7.9**	J	**20.6**		**6.2**	J	**26.5**		**15.1**		**21.1**		**6.9**	J	**36.8**	

Table 4-1
Soil Analytical Data
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC536-IS-0001-062112		OTC536-IS-0002-062112		OTC536-IS-0003-062212		OTC536-IS-0004-062212-FD		OTC536-IS-0005-062212		OTC536-IS-0006-062212		OTC536-IS-0007-062212		OTC536-IS-0008-062212		OTC536-IS-0009-062212		OTC536-IS-0010-062212		OTC536-IS-0011-062212	
				Sample Date	6/21/2012		6/21/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		28 - 30	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																										
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0082	U	0.008	U	0.0081	U	0.0079	U	0.0073	U	0.0079	U	0.0081	U	0.0077	U	0.0077	U	0.0079	U	0.0088	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.01	U	0.01	U	0.01	U	0.0099	U	0.0092	U	0.0099	U	0.01	U	0.0097	U	0.0096	U	0.0099	U	0.011	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.01	U	0.01	U	0.01	U	0.0099	U	0.0092	U	0.0099	U	0.01	U	0.0097	U	0.0096	U	0.0099	U	0.011	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0082	U	0.008	U	0.0081	U	0.0079	U	0.0073	U	0.0079	U	0.0081	U	0.0077	U	0.0077	U	0.0079	U	0.0088	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0082	U	0.008	U	0.0081	U	0.0079	U	0.0073	U	0.0079	U	0.0081	U	0.0077	U	0.0077	U	0.0079	U	0.0088	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0082	U	0.008	U	0.0081	U	0.0079	U	0.0073	U	0.0079	U	0.0081	U	0.0077	U	0.0077	U	0.0079	U	0.0088	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0082	U	0.008	U	0.0081	U	0.0079	U	0.0073	U	0.0079	U	0.0081	U	0.0077	U	0.0077	U	0.0079	U	0.0088	U
PETROLEUM HYDROCARBONS (mg/kg)																										
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	3.5	U	3	U	3.4	U	3	U	2.8	U	3	U	3.4	UJ	3.9	U	2.9	U	3.2	UJ	2.9	UJ
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	4	U	3.9	U	4.1	U	4	U	**3.95**	J	**10.5**	J	**6.24**	J	**4.43**	J	3.9	U	3.9	U	4.4	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000	4	U	3.9	U	4.1	U	4	U	3.7	U	10.5		4	U	**5.07**	J	3.9	U	3.9	U	4.4	U
CYANIDE (mg/kg)																										
CYANIDE	NE	22.0	46.9	0.073	U	0.069	U	0.072	U	0.07	U	0.064	U	0.07	U	0.073	U	0.068	U	0.068	U	0.07	U	0.077	U
TRITIUM (pCi/g)																										
TRITIUM	NE	NE	NE	4.03	U	3.86	U	4.25	U	4.09	U	4.11	U	4.13	U	4.12	U	4.06	U	4.14	U	4.13	U	4	U

Table 4-1
Soil Analytical Data
Buidling 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
R = result rejected during data validation
RCRA = Resource Conservation Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Table 4-2
Groundwater Analytical Data
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC536-GW-5361-070412	
			Sample date	7/4/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NM WQCC WQS (µg/L)[c]**	Result	VQ
TOTAL DISSOLVED SOLIDS (mg/L)	NE	NE	10,000	**3360**	
VOLATILES (µg/L)					
1,1,1-TRICHLOROETHANE	NE	200	60	0.2	U
1,1,2,2-TETRACHLOROETHANE	NE	NE	10	0.23	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	NE	NE	0.47	U
1,1,2-TRICHLOROETHANE	NE	5	10	0.22	U
1,1-DICHLOROETHANE	NE	NE	25	0.25	U
1,1-DICHLOROETHENE	NE	7	5	0.23	U
1,2,4-TRICHLOROBENZENE	NE	70	NE	0.5	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.20	NE	0.5	U
1,2-DIBROMOETHANE	NE	0.05	0.10	0.37	U
1,2-DICHLOROBENZENE	NE	600	NE	0.25	U
1,2-DICHLOROETHANE	NE	5	10	0.2	U
1,2-DICHLOROPROPANE	NE	5	NE	0.25	U
1,3-DICHLOROBENZENE	NE	NE	NE	0.2	U
1,4-DICHLOROBENZENE	NE	75	NE	0.23	U
2-HEXANONE	NE	NE	NE	4	U
ACETONE	NE	NE	NE	10	UJ
BENZENE	NE	5	10	0.2	U
BROMODICHLOROMETHANE	NE	80	NE	0.95	J
BROMOFORM	NE	80	NE	0.2	U
BROMOMETHANE	NE	NE	NE	0.5	U
CARBON DISULFIDE	NE	NE	NE	0.5	U
CARBON TETRACHLORIDE	NE	5	10	0.25	U
CHLOROBENZENE	NE	100	NE	0.2	U
CHLOROETHANE	NE	NE	NE	0.5	U
CHLOROFORM	NE	80	100	**2.3**	

Table 4-2
Groundwater Analytical Data
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC536-GW-5361-070412	
			Sample date	7/4/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NM WQCC WQS (µg/L)[c]**	Result	VQ
VOLATILES - continued (µg/L)					
CHLOROMETHANE	NE	NE	NE	2	U
CIS-1,2-DICHLOROETHYLENE	NE	70	NE	0.26	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	0.2	U
CYCLOHEXANE	NE	NE	NE	0.31	U
DIBROMOCHLOROMETHANE	NE	80	NE	0.2	U
DICHLORODIFLUOROMETHANE	NE	NE	NE	0.5	UJ
ETHYLBENZENE	NE	700	750	0.2	U
ISOPROPYLBENZENE	NE	NE	NE	0.2	U
METHYL ACETATE	NE	NE	NE	5	U
METHYL ETHYL KETONE	NE	NE	NE	2	U
METHYL ISOBUTYL KETONE	NE	NE	NE	2	U
METHYLCYCLOHEXANE	NE	NE	NE	0.38	U
METHYLENE CHLORIDE	NE	5	100	2	U
STYRENE	NE	100	NE	0.2	U
TERT-BUTYL METHYL ETHER	NE	NE	NE	0.34	U
TETRACHLOROETHYLENE	NE	5	20	0.25	U
TOLUENE	NE	1000	750	0.2	U
TRANS-1,2-DICHLOROETHENE	NE	100	NE	0.35	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.2	U
TRICHLOROETHYLENE	NE	5	100	0.26	U
TRICHLOROFLUOROMETHANE	NE	NE	NE	0.5	U
VINYL CHLORIDE	NE	2	1	0.22	U
XYLENES, TOTAL	NE	10000	620	0.52	U

Table 4-2
Groundwater Analytical Data
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC536-GW-5361-070412	
			Sample date	7/4/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NM WQCC WQS (µg/L)[c]**	Result	VQ
SEMIVOLATILES (µg/L)					
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	0.52	U
2,4,5-TRICHLOROPHENOL	NE	NE	NE	0.49	U
2,4,6-TRICHLOROPHENOL	NE	NE	NE	0.49	U
2,4-DICHLOROPHENOL	NE	NE	NE	0.49	U
2,4-DIMETHYLPHENOL	NE	NE	NE	1.1	U
2,4-DINITROPHENOL	NE	NE	NE	9.7	U
2,4-DINITROTOLUENE	NE	NE	NE	0.49	U
2,6-DINITROTOLUENE	NE	NE	NE	0.49	U
2-CHLORONAPHTHALENE	NE	NE	30	0.49	U
2-CHLOROPHENOL	NE	NE	NE	0.49	U
2-METHYLNAPHTHALENE	NE	NE	30	0.55	U
2-METHYLPHENOL (O-CRESOL)	NE	NE	NE	0.52	U
2-NITROANILINE	NE	NE	NE	0.49	U
2-NITROPHENOL	NE	NE	NE	0.52	U
3,3'-DICHLOROBENZIDINE	NE	NE	NE	0.97	U
3-NITROANILINE	NE	NE	NE	0.49	U
4,6-DINITRO-2-METHYLPHENOL	NE	NE	NE	1.9	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.49	U
4-CHLORO-3-METHYLPHENOL	NE	NE	NE	0.49	U
4-CHLOROANILINE	NE	NE	NE	0.49	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.49	U
4-NITROANILINE	NE	NE	NE	0.49	U
4-NITROPHENOL	NE	NE	NE	4.9	U
ACENAPHTHENE	NE	NE	30	0.49	U
ACENAPHTHYLENE	NE	NE	30	0.49	U
ACETOPHENONE	NE	NE	NE	0.5	U
ANTHRACENE	NE	NE	30	0.49	U

Table 4-2
Groundwater Analytical Data
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC536-GW-5361-070412	
			Sample date	7/4/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NM WQCC WQS (µg/L)[c]**	Result	VQ
SEMIVOLATILES - continued (µg/L)					
ATRAZINE	NE	3	NE	0.66	U
BENZALDEHYDE	NE	NE	NE	4.9	U
BENZO(A)ANTHRACENE	NE	NE	30	0.49	U
BENZO(A)PYRENE	NE	0.20	0.7	0.49	U
BENZO(B)FLUORANTHENE	NE	NE	30	0.49	U
BENZO(G,H,I)PERYLENE	NE	NE	30	0.49	U
BENZO(K)FLUORANTHENE	NE	NE	30	0.49	U
BENZYL BUTYL PHTHALATE	NE	NE	NE	1.1	U
BIPHENYL	NE	NE	NE	0.49	U
BIS(2-CHLOROETHOXY) METHANE	NE	NE	NE	0.49	U
BIS(2-CHLOROETHYL) ETHER	NE	NE	NE	0.52	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	6	NE	1.1	U
CAPROLACTAM	NE	NE	NE	3.9	U
CARBAZOLE	NE	NE	NE	0.49	U
CHRYSENE	NE	NE	30	0.49	U
DIBENZ(A,H)ANTHRACENE	NE	NE	30	0.5	U
DIBENZOFURAN	NE	NE	NE	0.49	U
DIETHYL PHTHALATE	NE	NE	NE	1.1	U
DIMETHYL PHTHALATE	NE	NE	NE	0.96	U
DI-N-BUTYL PHTHALATE	NE	NE	NE	0.84	U
DI-N-OCTYLPHTHALATE	NE	NE	NE	1.1	U
FLUORANTHENE	NE	NE	30	0.49	U
FLUORENE	NE	NE	30	0.49	U
HEXACHLOROBENZENE	NE	1	NE	0.54	U
HEXACHLOROBUTADIENE	NE	NE	NE	0.97	U
HEXACHLOROCYCLOPENTADIENE	NE	50	NE	1.8	U
HEXACHLOROETHANE	NE	NE	NE	0.97	U

Table 4-2
Groundwater Analytical Data
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC536-GW-5361-070412	
			Sample date	7/4/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NM WQCC WQS (µg/L)[c]**	Result	VQ
SEMIVOLATILES - continued (µg/L)					
INDENO(1,2,3-C,D)PYRENE	NE	NE	30	0.49	U
ISOPHORONE	NE	NE	NE	0.49	UJ
M,P-CRESOL	NE	NE	NE	1.1	U
NAPHTHALENE	NE	NE	30	0.78	U
NITROBENZENE	NE	NE	NE	0.57	U
N-NITROSODI-N-PROPYLAMINE	NE	NE	NE	0.49	U
N-NITROSODIPHENYLAMINE	NE	NE	NE	0.97	U
PENTACHLOROPHENOL	NE	1	NE	5.2	U
PHENANTHRENE	NE	NE	30	0.49	U
PHENOL	NE	NE	NE	0.49	U
PYRENE	NE	NE	30	0.49	U
EXPLOSIVES (µg/L)					
1,3,5-TRINITROBENZENE	NE	NE	NE	0.076	U
1,3-DINITROBENZENE	NE	NE	NE	0.092	U
2,4,6-TRINITROTOLUENE	NE	NE	NE	0.076	U
2,4-DINITROTOLUENE	NE	NE	NE	0.076	U
2,6-DINITROTOLUENE	NE	NE	NE	0.076	U
2-AMINO-4,6-DINITROTOLUENE	NE	NE	NE	0.076	U
2-NITROTOLUENE	NE	NE	NE	0.076	U
3-NITROTOLUENE	NE	NE	NE	0.076	U
4-AMINO-2,6-DINITROTOLUENE	NE	NE	NE	0.078	U
4-NITROTOLUENE	NE	NE	NE	0.076	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	NE	NE	0.076	U
NITROBENZENE	NE	NE	NE	0.08	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	NE	NE	0.076	U
TETRYL	NE	NE	NE	0.076	U

Table 4-2
Groundwater Analytical Data
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC536-GW-5361-070412	
			Sample date	7/4/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NM WQCC WQS (µg/L)[c]**	Result	VQ
METALS (µg/L)					
ALUMINUM	1043	NE	NE	**139**	J
ANTIMONY	6	6	NE	4	U
ARSENIC	10	10	100	2	U
BARIUM	38	2000	1000	**19**	J
BERYLLIUM	4	4	NE	1	U
CADMIUM	5	5	10	2	U
CALCIUM	1,136,664	NE	NE	**592,000**	J
CHROMIUM, TOTAL	12	100	50	2	U
COBALT	36	NE	NE	1	U
COPPER	9.8	1300	1000	2	U
IRON	300	NE	1000	**126**	J
LEAD	9	15	50	2	U
MAGNESIUM	3,692,782	NE	NE	**173,000**	
MANGANESE	50	NE	200	**27.4**	
MERCURY	0.5	2	2	0.05	U
NICKEL	22	NE	NE	2	U
POTASSIUM	212,144	NE	NE	**7950**	J
SELENIUM	50	50	50	**7.5**	J
SILVER	10	NE	50	1	U
SODIUM	20,989,580	NE	NE	**665,000**	
THALLIUM	2	2	NE	3.7	U
VANADIUM	90	NE	NE	**12.3**	J
ZINC	17	NE	10000	10	U

Table 4-2
Groundwater Analytical Data
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC536-GW-5361-070412	
			Sample date	7/4/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NM WQCC WQS (µg/L)[c]**	Result	VQ
PCBs (µg/L)					
PCB-1016 (AROCHLOR 1016)	NE	NE	1	0.19	U
PCB-1221 (AROCHLOR 1221)	NE	NE	1	0.24	U
PCB-1232 (AROCHLOR 1232)	NE	NE	1	0.24	U
PCB-1242 (AROCHLOR 1242)	NE	NE	1	0.19	U
PCB-1248 (AROCHLOR 1248)	NE	NE	1	0.19	U
PCB-1254 (AROCHLOR 1254)	NE	NE	1	0.19	U
PCB-1260 (AROCHLOR 1260)	NE	NE	1	0.19	U
PETROLEUM HYDROCARBONS (µg/L) [d]					
GASOLINE RANGE ORGANICS C6-C10	NE	NE	See individual VOC & SVOC	50	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	400	96	U
OIL RANGE ORGANICS C28-C40	NE	NE	200	96	U
CYANIDE (µg/L)					
CYANIDE	NE	200	200	5	U
TRITIUM (pCi/L)					
TRITIUM	NE	NE	NE	620	U

Table 4-2
Groundwater Analytical Data
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NM WQCC Water Quality Standard

Value exceeds EPA Maximum Contaminant Level

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," letter to D. Scruggs, Chief, Environmental Restoration Program, Holloman Air Force Base from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, New Mexico Environment Department, March 1.*

[b] *U.S. Environmental Protection Agency (EPA), 2012b, National Primary Drinking Water Regulations: List of Drinking Water Contaminants and Maximum Contaminant Levels.*

[c] *New Mexico Water Quality Control Commission, Water Quality Standards, 20.6.2 New Mexico Administrative Code.*

[d] New Mexico Environment Department (NMED), 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, New Mexico Environment Department, Santa Fe, New Mexico, February, Table 6-2. TPH Screening Guidelines for Potable Groundwater (GW-1), February 2012, Table A-1: NMED Soil Screening Levels, updated June 2012. "Unknown oil" criteria used for Oil Range Oraganics.

EPA = U.S. Environmental Protection Agency

GW = groundwater

J = estimated value

MCL = Maximum Contaminant Level

µg/L = micrograms per liter

mg/L = milligrams per liter

NE = not established

NM WQCC= New Mexico Water Quality Control Commission

pCi/L = picocuries per liter

RCRA = Resource Conservation Recovery Act

RFI = RCRA Facility Investigation

U = not detected at the detection limit shown

VQ = validation qualifier

WQS = Water Quality Standard

Table 4-3
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	LDY-IDW01-090412	
		Sample Date	9/4/2012	
		Sample Type	Waste	
		40 CFR 261 Waste Characteristic Criteria	Result	Lab Qual
General Chemistry				
Corrosivity as pH	pH Units	> 2 and < 12.5	**7.7**	
Cyanide Reactivity	mg/kg	< 250	1.5	U
Ignitability (Flashpoint)	°F	> 140 °F	>200	
Solids, Percent	%	-	**84.4**	
Sulfide Reactivity	mg/kg	< 500	59	U
TCLP Volatiles				
Benzene	mg/L	0.5	0.0020	U
Chlorobenzene	mg/L	100	0.0020	U
Chloroform	mg/L	6	0.0022	U
Carbon tetrachloride	mg/L	0.5	0.0025	U
1,1-Dichloroethylene	mg/L	0.7	0.0023	U
1,2-Dichloroethane	mg/L	0.5	0.0020	U
p-Dichlorobenzene	mg/L	7.5	0.0023	U
Methyl ethyl ketone	mg/L	200	0.0020	U
Tetrachloroethylene	mg/L	0.7	0.0025	U
Trichloroethylene	mg/L	0.5	0.0026	U
Vinyl chloride	mg/L	0.2	0.0022	U
TCLP Semivolatiles				
2-Methylphenol	mg/L	200	0.0054	U
3&4-Methylphenol	mg/L	200	0.011	U
Pentachlorophenol	mg/L	100	0.054	U
2,4,5-Trichlorophenol	mg/L	400	0.0050	U
2,4,6-Trichlorophenol	mg/L	2	0.0050	U
1,4-Dichlorobenzene	mg/L	7.5	0.010	U
2,4-Dinitrotoluene	mg/L	0.13	0.0050	U
Hexachlorobenzene	mg/L	0.13	0.0056	U
Hexachlorobutadiene	mg/L	0.5	0.010	U
Hexachloroethane	mg/L	3	0.010	U
Nitrobenzene	mg/L	2	0.0059	U
Pyridine	mg/L	100	0.016	U
TCLP Metals				
Arsenic	mg/L	5	0.020	U
Barium	mg/L	100	**0.12**	J
Cadmium	mg/L	1	0.010	U
Chromium	mg/L	5	0.010	U
Lead	mg/L	5	0.010	U
Mercury	mg/L	0.2	0.00050	U
Selenium	mg/L	1	0.020	U
Silver	mg/L	5	0.010	U

Table 4-3
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

°F = degrees Fahrenheit
> = greater than
< = less than
% = percent
CFR = Code of Federal Regulations
J = estimated value
Lab Qual = laboratory qualifier
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
TCLP = Toxicity Characteristic Leaching Procedure
U = not detected at the detection limit shown

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles				
Acetone	µg/L	NE	10	U
Benzene	µg/L	5	0.21	U
Bromodichloromethane	µg/L	80	0.20	U
Bromoform	µg/L	80	0.34	U
Chlorobenzene	µg/L	100	0.20	U
Chloroethane	µg/L	NE	0.50	U
Chloroform	µg/L	80	0.26	U
Carbon disulfide	µg/L	NE	0.49	U
Carbon tetrachloride	µg/L	5	0.31	U
Cyclohexane	µg/L	NE	0.48	U
1,1-Dichloroethane	µg/L	NE	0.21	U
1,1-Dichloroethylene	µg/L	7	0.20	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.71	U
1,2-Dibromoethane	µg/L	0.05	0.30	U
1,2-Dichloroethane	µg/L	5	0.22	U
1,2-Dichloropropane	µg/L	5	0.26	U
Dibromochloromethane	µg/L	80	0.20	U
Dichlorodifluoromethane	µg/L	NE	0.50	U
cis-1,2-Dichloroethylene	µg/L	70	**0.42**	J
cis-1,3-Dichloropropene	µg/L	NE	0.22	U
m-Dichlorobenzene	µg/L	NE	0.25	U
o-Dichlorobenzene	µg/L	600	0.22	U
p-Dichlorobenzene	µg/L	75	0.20	U
trans-1,2-Dichloroethylene	µg/L	100	0.23	U
trans-1,3-Dichloropropene	µg/L	NE	0.21	U
Ethylbenzene	µg/L	700	0.29	U
Freon 113	µg/L	NE	0.33	U
2-Hexanone	µg/L	NE	2.0	U
Isopropylbenzene	µg/L	NE	0.20	U
4-Methyl-2-pentanone	µg/L	NE	2.3	U
Methyl Acetate	µg/L	NE	5.0	U
Methyl bromide	µg/L	NE	0.79	U
Methyl chloride	µg/L	NE	0.50	U
Methylcyclohexane	µg/L	NE	0.20	U
Methylene chloride	µg/L	5	2.0	U
Methyl ethyl ketone	µg/L	NE	3.1	U
Methyl Tert Butyl Ether	µg/L	NE	0.21	U
Styrene	µg/L	100	0.20	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles (continued)				
1,1,1-Trichloroethane	µg/L	200	0.20	U
1,1,2,2-Tetrachloroethane	µg/L	NE	0.24	U
1,1,2-Trichloroethane	µg/L	5	0.20	U
1,2,4-Trichlorobenzene	µg/L	70	0.50	U
Tetrachloroethylene	µg/L	5	0.32	U
Toluene	µg/L	1000	0.20	U
Trichloroethylene	µg/L	5	0.31	U
Trichlorofluoromethane	µg/L	NE	0.50	U
Vinyl chloride	µg/L	2	0.44	U
Xylene (total)	µg/L	10000	0.50	U
Semivolatiles				
2-Chlorophenol	µg/L	NE	0.68	U
4-Chloro-3-methyl phenol	µg/L	NE	0.78	U
2,4-Dichlorophenol	µg/L	NE	0.67	U
2,4-Dimethylphenol	µg/L	NE	0.74	U
2,4-Dinitrophenol	µg/L	NE	5.0	U
4,6-Dinitro-o-cresol	µg/L	NE	1.4	U
2-Methylphenol	µg/L	NE	0.69	U
3&4-Methylphenol	µg/L	NE	1.3	U
2-Nitrophenol	µg/L	NE	0.65	U
4-Nitrophenol	µg/L	NE	4.8	U
Pentachlorophenol	µg/L	1	4.8	U
Phenol	µg/L	NE	0.53	U
2,4,5-Trichlorophenol	µg/L	NE	0.86	U
2,4,6-Trichlorophenol	µg/L	NE	0.75	U
Acenaphthene	µg/L	NE	0.67	U
Acenaphthylene	µg/L	NE	0.67	U
Acetophenone	µg/L	NE	0.72	U
Anthracene	µg/L	NE	0.72	U
Atrazine	µg/L	3	0.83	U
Benzaldehyde	µg/L	NE	4.8	U
Benzo(a)anthracene	µg/L	NE	0.52	U
Benzo(a)pyrene	µg/L	0.2	0.55	U
Benzo(b)fluoranthene	µg/L	NE	0.73	U
Benzo(g,h,i)perylene	µg/L	NE	0.64	U
Benzo(k)fluoranthene	µg/L	NE	0.64	U
4-Bromophenyl phenyl ether	µg/L	NE	0.76	U
Butyl benzyl phthalate	µg/L	NE	0.68	U
1,1'-Biphenyl	µg/L	NE	0.92	U
2-Chloronaphthalene	µg/L	NE	0.70	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Semivolatiles (continued)				
4-Chloroaniline	µg/L	NE	0.66	U
Caprolactam	µg/L	NE	2.4	U
Carbazole	µg/L	NE	0.50	U
Chrysene	µg/L	NE	0.56	U
bis(2-Chloroethoxy)methane	µg/L	NE	0.67	U
bis(2-Chloroethyl)ether	µg/L	NE	0.69	U
bis(2-Chloroisopropyl)ether	µg/L	NE	0.76	U
4-Chlorophenyl phenyl ether	µg/L	NE	0.84	U
2,4-Dinitrotoluene	µg/L	NE	0.66	U
2,6-Dinitrotoluene	µg/L	NE	0.77	U
3,3'-Dichlorobenzidine	µg/L	NE	0.71	U
Dibenzo(a,h)anthracene	µg/L	NE	0.56	U
Dibenzofuran	µg/L	NE	0.72	U
Di-n-butyl phthalate	µg/L	NE	0.96	U
Di-n-octyl phthalate	µg/L	NE	0.96	U
Diethyl phthalate	µg/L	NE	0.96	U
Dimethyl phthalate	µg/L	NE	0.77	U
bis(2-Ethylhexyl)phthalate	µg/L	6	1.1	U
Fluoranthene	µg/L	NE	0.56	U
Fluorene	µg/L	NE	0.73	U
Hexachlorobenzene	µg/L	1	0.66	U
Hexachlorobutadiene	µg/L	NE	0.92	U
Hexachlorocyclopentadiene	µg/L	50	0.76	U
Hexachloroethane	µg/L	NE	0.71	U
Indeno(1,2,3-cd)pyrene	µg/L	NE	0.55	U
Isophorone	µg/L	NE	0.61	U
2-Methylnaphthalene	µg/L	NE	0.66	U
2-Nitroaniline	µg/L	NE	0.72	U
3-Nitroaniline	µg/L	NE	0.62	U
4-Nitroaniline	µg/L	NE	0.93	U
Naphthalene	µg/L	NE	0.61	U
Nitrobenzene	µg/L	NE	0.69	U
N-Nitroso-di-n-propylamine	µg/L	NE	0.82	U
N-Nitrosodiphenylamine	µg/L	NE	0.96	U
Phenanthrene	µg/L	NE	0.68	U
Pyrene	µg/L	NE	0.65	U
Petroleum Hydrocarbons				
Gasoline Range Organics (C6-C10)	mg/L	NE	0.05	U
Diesel Range Organics (C10-C28)	mg/L	NE	**0.115**	J
Oil Range Organics (C28-C40)	mg/L	NE	0.10	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Metals				
Aluminum	µg/L	NE	**36.2**	J
Antimony	µg/L	6	**6.7**	J
Arsenic	µg/L	10	2.5	U
Barium	µg/L	2000	**29.1**	J
Beryllium	µg/L	4	0.50	U
Cadmium	µg/L	5	1.0	U
Calcium	µg/L	NE	**654,000**	
Chromium	µg/L	100	4	U
Cobalt	µg/L	NE	**6.2**	J
Copper	µg/L	1300	**2.9**	J
Iron	µg/L	NE	**97.5**	J
Lead	µg/L	15	2.2	U
Magnesium	µg/L	NE	**310,000**	
Manganese	µg/L	NE	**179**	
Mercury	µg/L	2	0.03	U
Nickel	µg/L	NE	**3.7**	J
Potassium	µg/L	NE	**16,500**	
Selenium	µg/L	50	4.0	U
Silver	µg/L	NE	0.50	U
Sodium	µg/L	NE	**762,000**	
Thallium	µg/L	2	0.078	U
Vanadium	µg/L	NE	**4.5**	J
Zinc	µg/L	NE	**12.8**	J

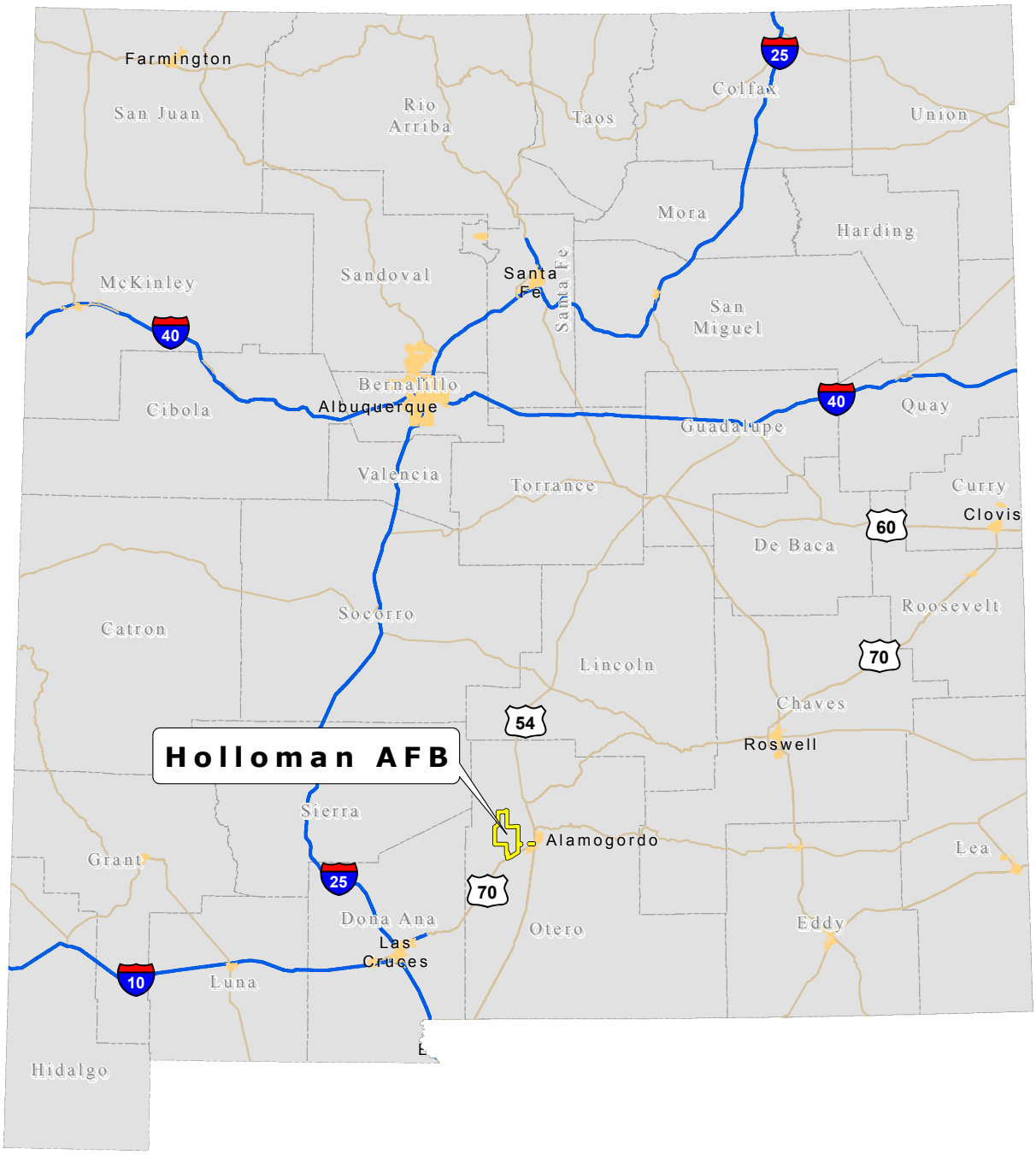
Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

[a] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

EPA = U.S. Environmental Protection Agency.
J = estimated value.
MCL = maximum contaminant level.
NE = not established
µg/L = micrograms per liter.
mg/L = milligrams per liter.
RSL = regional screening level.
U = not detected at the detection limit shown.
VQ = validation qualifier.

Figures



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Date: 8/28/2013

Approved By: BFoss

Checked By: CLong

Drawn By: BGrod

Office: Hou

Legend

Holloman AFB

N

WGS 84 UTM Zone 13N Meters

0 20 40 80
Kilometers

0 10 20 40
Miles

Figure 1-1

Holloman Air Force Base Location

Holloman AFB, New Mexico

Office	Drawn By	Checked By	Approved By	Date	File Path
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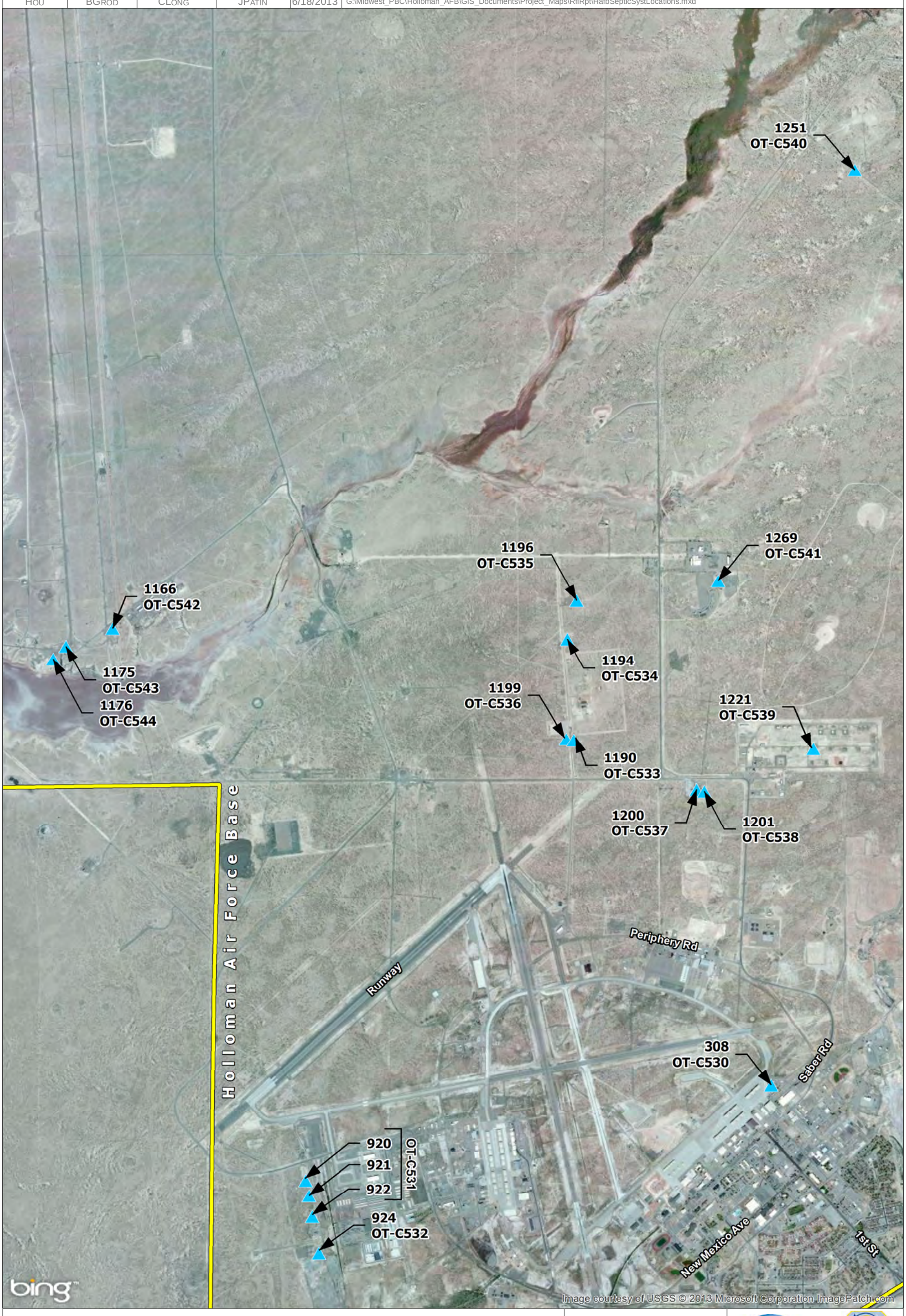


LEGEND

- Holloman AFB
- Septic Tank System

N

WGS 84 UTM Zone 13N
Meters

1 inch = 2,800 feet

0 700 1,400 2,800
Feet

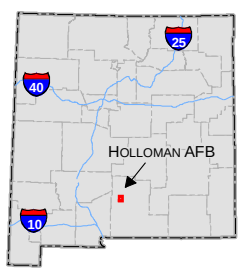
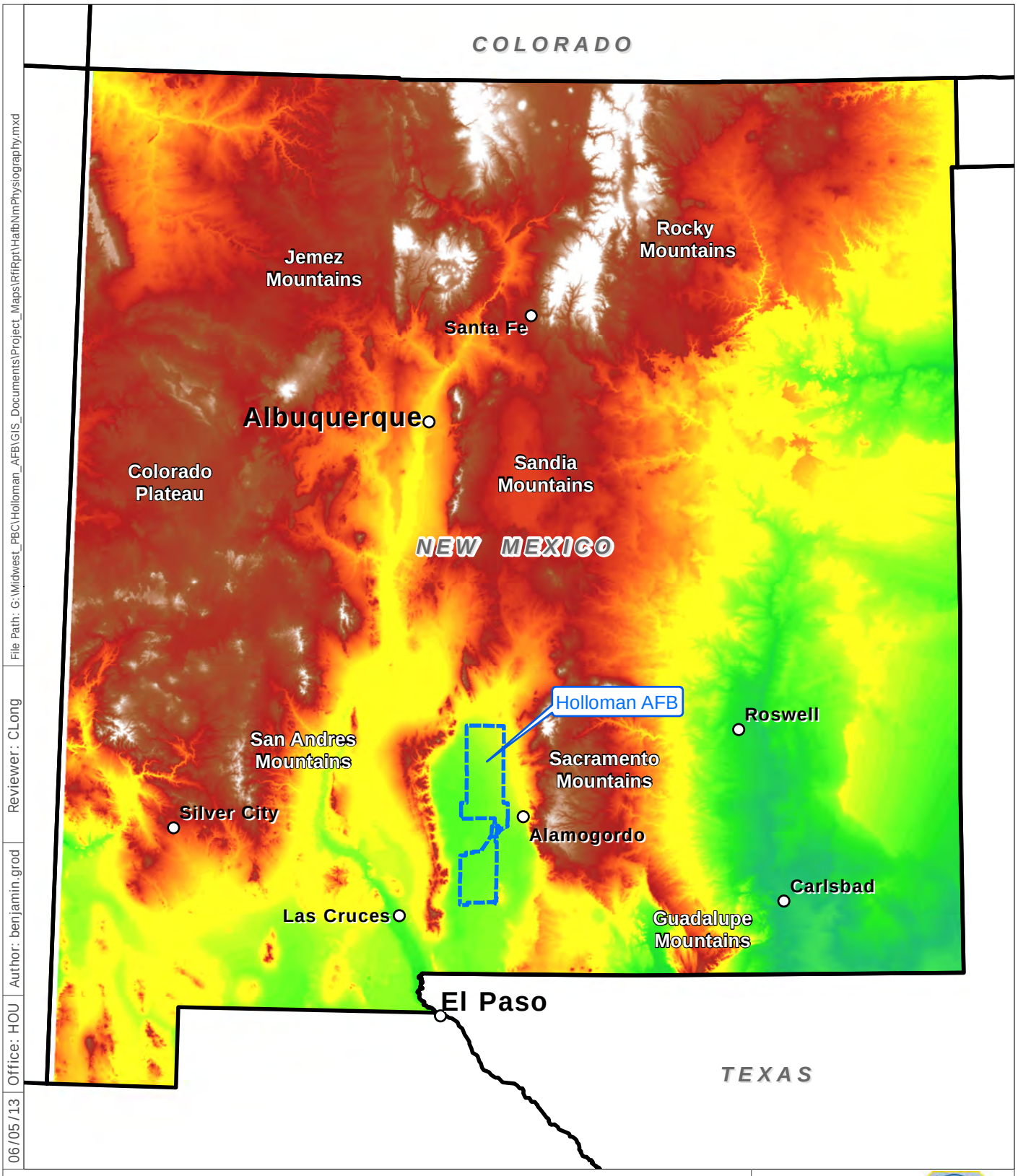


Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
Holloman AFB, NM



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Reviewer: CLong
Author: benjamin.grod
Office: HOU
06/05/13

Legend

Holloman Air Force Base (AFB) Installation Area

Elevation
- High : 3,936 meters
- Low : 0 meters

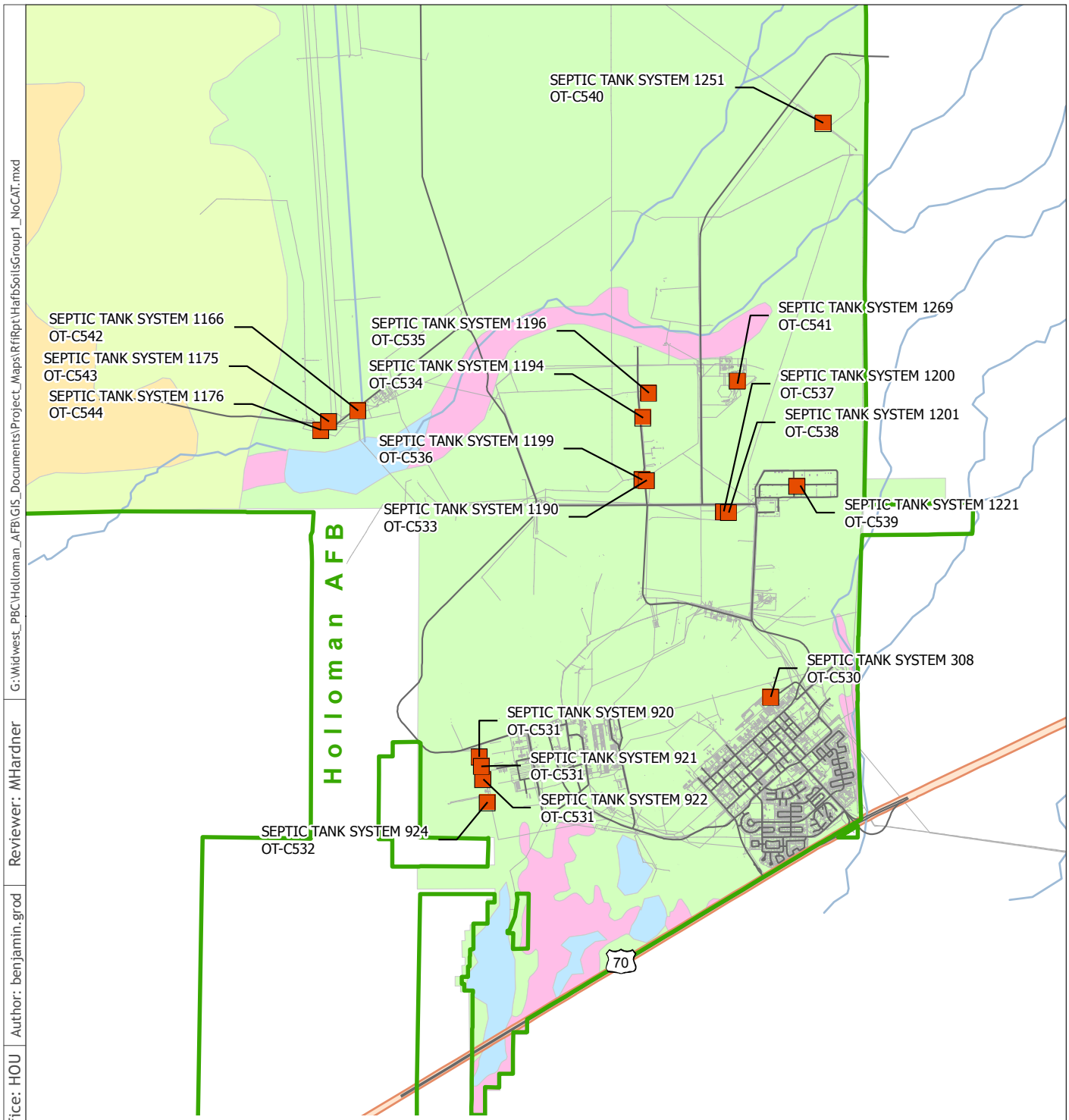
NAD 83 SPCS
New Mexico Central
Feet

0 50
Miles

Figure 2-1

Physiographic Map

Holloman AFB, New Mexico



Note:
1) Soils types at Holloman Air Force Base, New Mexico are based on United States Department of Agriculture (USDA) Soil Conservation Service Classifications. Source USDA, 1981

06/18/13 | Office: HOU | Author: benjamin.grod | Reviewer: MHardner | G:\Widwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbSoilsGroup1_NoCAT.mxd

Legend

- Installation Area
- Group 1 Septic Tank Sites
- Surface Water
- Active Dune Land Gypsum
- Duneland Yesum Association
- Holloman-Gypsum Land-Yesum complex
- Intermittent Water
- Mead Silty Clay Loam
- Rock Land Warm

NAD 83 SPCS
New Mexico Central
Feet

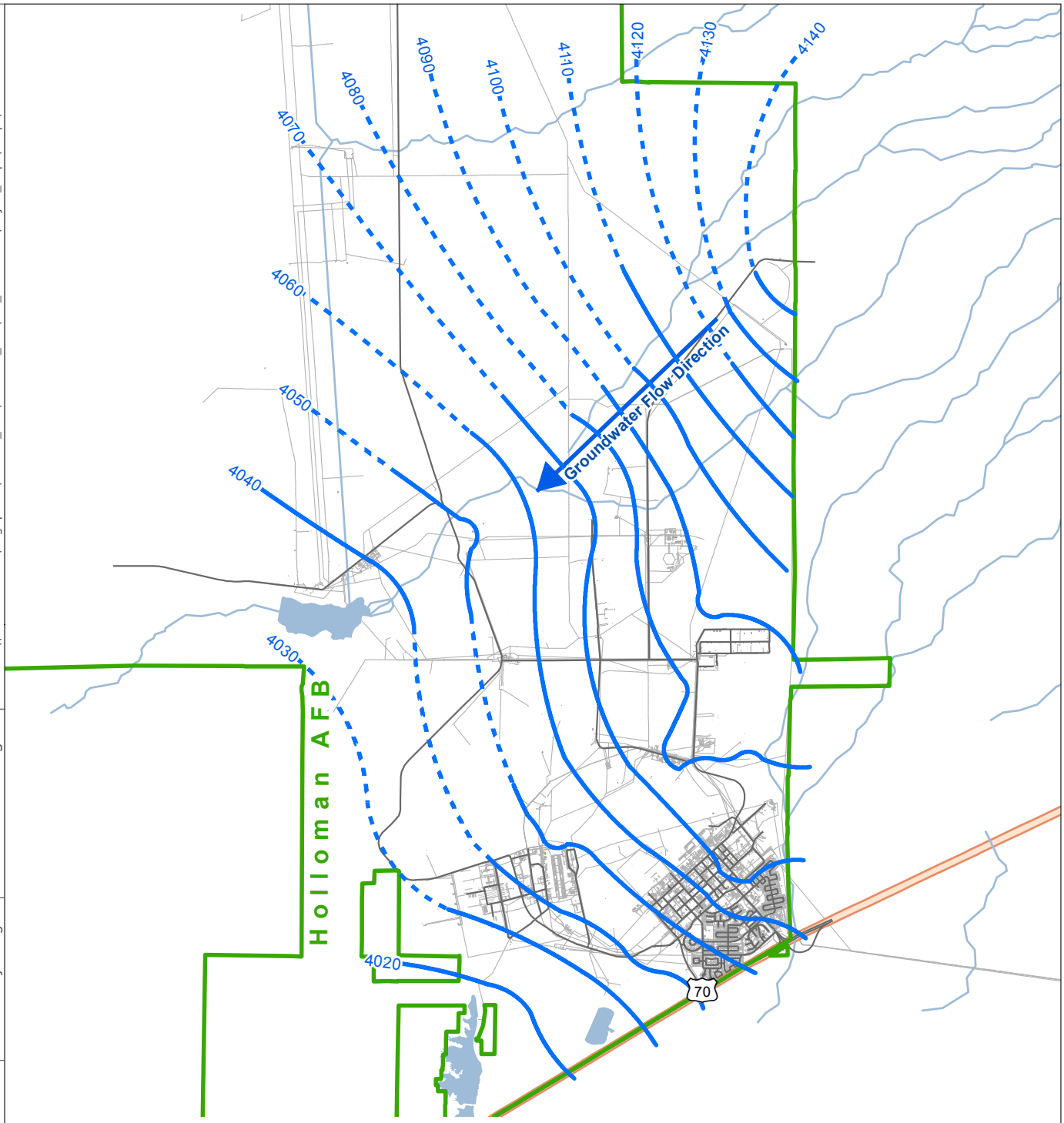
0 7,000
Feet

CBI

Figure 2-2

Septic Systems Soils Map

Holloman AFB, New Mexico



Note:
1) Groundwater contour map showing groundwater elevation contours across Holloman Air Force Base, New Mexico, are based on 2002 measurements taken from the shallow aquifer.
2) Source: Holloman AFB GIS, 2002 LTM.

08/28/13 | Office: HOU | Author: benjamin.grod | Reviewer: CLong | File Path: \\cfsfs01.cfs.com\arcgisprod2\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbGw2002.mxd

Legend

- Installation Area
- Groundwater Flow Direction
- Groundwater Elevation Contour (ft) (Dashed where inferred)
- Surface Water

NAD 83 SPCS
New Mexico Central
Feet

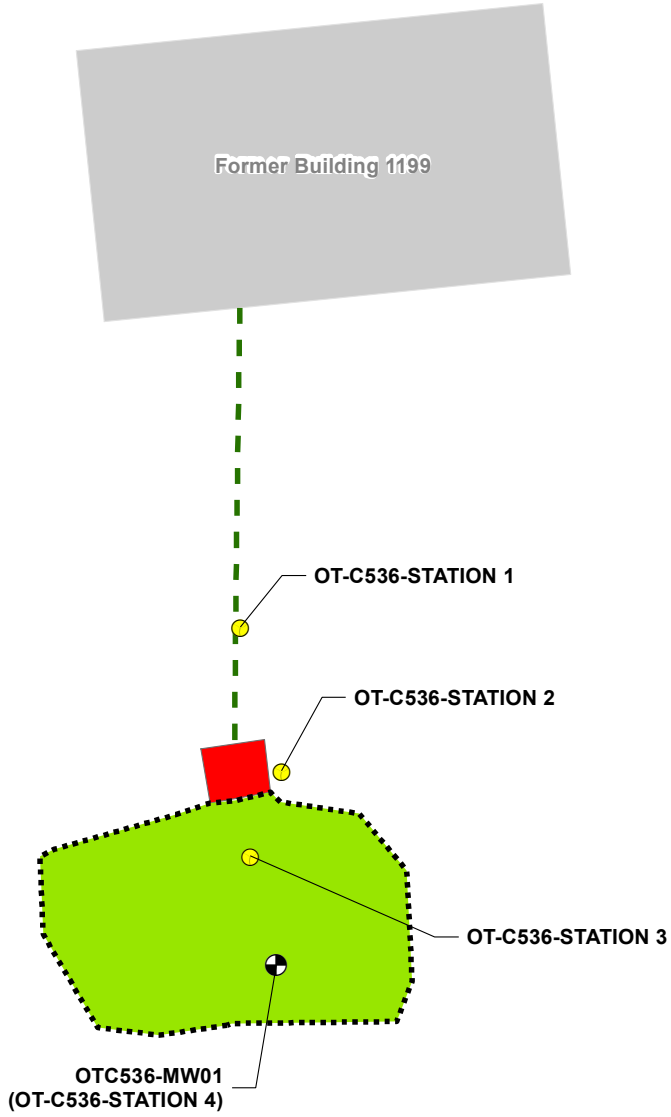
0 8,000
Feet

Figure 2-3

Regional Groundwater Contour Map

Holloman AFB, New Mexico

9/25/2013 | Office: HOU | Author: benjamin.grod | Reviewer: CLong | G:\Widwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\OTC536\OTC536_STS-1199_SiteLayout.mxd



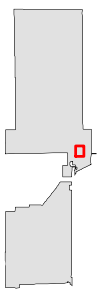
Legend

- Monitoring Well
- Soil Boring Station
- Influent Line
- Leach Field
- Septic Tank
- Building

N

NAD 83 SPCS
New Mexico Central
Feet

0 10 20
Feet



CBI

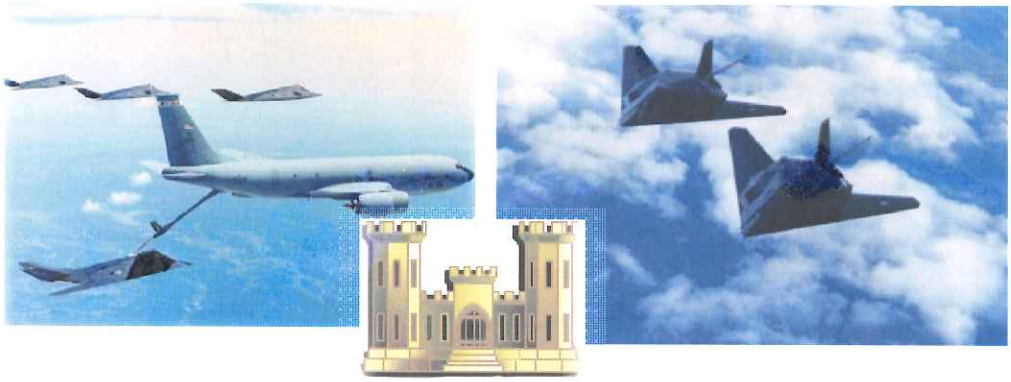
Figure 3-1

Site Layout and
Sampling Locations
Building 1199
Septic Tank System OT-C536

Holloman AFB, New Mexico

Appendix A
Historical Records

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS



Holloman Air Force Base
New Mexico

APRIL 2007

Headquarters, Air Combat Command
Langley Air Force Base, Virginia

49 CES/CEV
Holloman Air Force Base, New Mexico

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH FIGHTER WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

APR 27 2007

MEMORANDUM FOR NEW MEXICO ENVIRONMENT DEPARTMENT
Attn: Mr. James P. Bearzi
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe NM 87505-6303

FROM: 49 CES/CEV
550 Tabosa Ave.
Holloman AFB NM 88330-8458

SUBJECT: Submittal of Information Required by NMED Letter of August 30, 2006
Septic Tanks and Associated Drain Fields, Holloman AFB
EPA ID# NM6572124422

1. Pursuant to Part 4, Condition IV.B.3 of Permit No. NM6572124422, Holloman AFB is submitting the final portion of the required information.

2. This final portion of the required information covers the history of the facilities served by each septic tank and, based on the historic activities that occurred in each facility, the possible wastes that were discharged into the septic systems.

3. If you have any questions or comments, please contact Mr. Dave Griffin or Mr. George Fish at (505) 572-3931.

DEBORAH J. HARTELL
Chief, Environmental Flight

cc: w/Attachments
Mr. Cornelius Amindyas
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

Mr. David Strasser
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS
HISTORY

Holloman's records show a list of fifty seven (57) septic tank systems broken into three categories- Active Septic Systems, Inactive Septic Systems, and Removed Septic Systems. The systems are identified by the Building number they are/were attached to. There are twenty five (25) Active Septic Systems which are listed in this report. There are twenty one (21) Inactive Septic Systems that are listed and the history of activities in the building associated with the system is identified to the extent of available knowledge. There are eleven (11) Removed Septic Systems listed with histories based on available record knowledge.

The Active systems are identified, but no histories of the buildings are provided as this will likely change over time particularly with change in mission (aircraft on base) or tie-in to the base waste water treatment system. A history will be added to this list if and when the septic system is no longer needed and moved to the Inactive or Removed list.

The Inactive systems are scheduled for proper closure per guidance given in the NMED Liquid Waste Regulation 20.7.3.307 NMAC. This regulation calls for capping of the line(s) from the building to the septic tank, pumping out the tanks contents, penetration of the bottom of the tank, along with collapse of the tank roof and filling of the tank with sand or soil.

The septic systems on the Removed list have had the actual septic tank excavated and removed.

A search of Real Property records and the Historic Properties Inventory yielded the information available on the buildings. There was not information available on every building, but if new information becomes available, it will be added to the list.

Attachment 54a-e shows the current plan of where the sewer system lies to show what buildings are currently connected to Holloman's Sewer System. Any building that does not have an active septic tank is either abandoned or connect to Holloman's Sewer System.

ACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	149	1998		1000
2	312	1994		1000
3	375	1968		500
4	882			
5	864 (863)	1994	5'x8'x6'4"	750
6	885	1970	7'10"x4'8"x6'10"	1000
7	886			
8	887	1991		1000
9	923	1959	4'2"x7"x7'9.5"	1600
10	1022	1992		1200
11	1066	1994		1000
12	1160	1957	5'x12'4"x7'6"	1500
13	1161	1957		750
14	1162	1957		350
15	1163	1957		350
16	1169	1962		1680
17	1195	1962		1260
18	1256	1970	12'8"x4'8"x5'	
19	1270			
20	1271			
21	1278	2004		1250
22	1284			
23	1625			
24	75600	1989		1200
25	La Luz Gate (1290)(**1292**)	2004		1250

INACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	308	1965		
2	920	1959	4'2"x7"x7'9.5"	1600
3	921	1959	4'2"x7"x7'9.5"	1600
4	922	1959	4'2"x7"x7'9.5"	1600
5	924	1959	4'2"x7"x7'9.5"	1600
6	1091	1969	6'8"x3'x8'5"	
7	1097	1987	5'10"x5'x7'8"	1672
8	1190	1952	9'x4'x8'10"	3000
9	1194	1987	4'x4'x8'10"	1350
10	1196	1993	4'6"x11'x6'	1300
11	1199	1957		500
12	1200	1954	4'x8'x4'	1000
13	1201	1951	2'6"x6'6"x5'5"	650
14	1219	1985	5'4"x10'6"x8'4"	
15	1221	1983	4'8"x9'4"x6'2"	1100
16	1226	1985	5'6'2"x6'	
17	1235	1986		1189
18	1239	1977	4'6"x8'6"x6'	750
19	1250	1957		350
20	1251			
21	1269	1966	4'6"x9'	500

INACTIVE SEPTIC SYSTEMS

BUILDING 308

This is a 3200 SF building originally constructed in 1965. The original operation in the building was calibration of guided weapons for aircraft. In the 1970s and early 1980s the building was used as a nosedock for F-4 - Test Aircraft Radar electronic work area. It has never had a floor drain.
This facility is currently being used to store air craft support equipment for Building 309. The shop has been used in the past for servicing, inspecting, and repairing AGE equipment, but due to the reduction in personnel, this work is currently only performed in Building 309. The need to expand the work area for AGE equipment maintenance into Building 308 in the near future is not anticipated. A current view of the building is shown below in Figure 1.

Figure 1: Picture of Bldg. 308

Facilities associated with the septic system consist of:

- Toilet
- Lavatory
- Janitorial Sink

The building is located at 340 Delaware Ave. The point of contact for this building is Ms. Vicky Cruz and Mr. Adam Ferrara, they can be reached at 575-~~475~~-5272. The hours

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of operation for this building when it is in use is one 8.5 hr shift (0630-1500) and one 9 hr shift (1500-2400), five days per week.

Industrial Wastewater Drainage: There are no floor or trench drains in this facility. A janitor's sink is located in the restroom. The sanitary sewer pipe from the restroom connects with the pipe from the restrooms in Building in 309. The effluent pipe then proceeds south to Manhole 334E the layout of this facility can be seen below in **Figure 2**. At the time of the inspection surveyors were unable to open Manhole 334E. No cross-connections to the storm sewer were identified.

Industrial Wastewater Sources/Existing Pretreatment/ Existing Management Practices: There is only once source of industrial wastewater from this facility: floor washing

Floor Washing: The floor in this facility is washed every three months using a Tennant floor scrubber, 10 gallons of water and Simple Green. Average and maximum daily wastewater flows from this activity are estimated to be less than one gallon and ten gallons, respectively. The wastewater from this activity is discharged into the French drain at Building 309; therefore, the quantity of wastewater generated by this activity is included in the flow summary for Building 309.

Existing management practices consist of sweeping the floor prior to washing it.

Site Description: Aircraft Corrosion Control
Site Specific Contingency Action Plan: See Attachment 1
Secondary Containment Routes: None
Probable Spill Route: Leaks dissipate in local area on ground
Material Compatibility: No material incompatibilities

Connected to Sewer?

Stored Substances:

Chemical	Container Type
MEK	1 gallon can
Polyurethane Paint	1 gallon can
Naptha	1 gallon can
Toluene	1 gallon can
Epoxy Primer	1 gallon can
PD-680 Type II	55 gallon drum
Waste Paint/Thinners	55 gallon drum

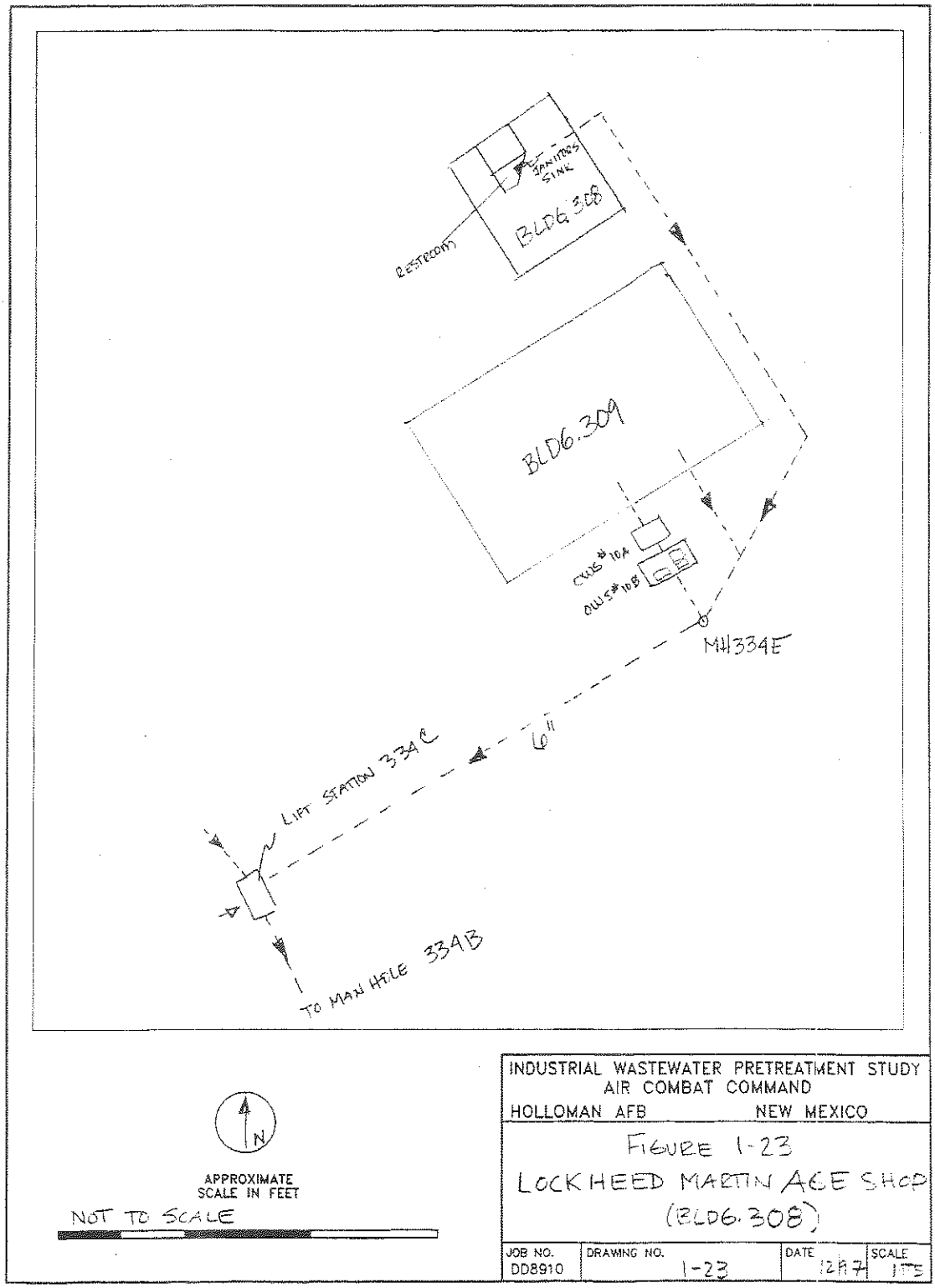

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Figure 2: Layout of Bldg. 308 and 309

INACTIVE SEPTIC SYSTEMS

BUILDINGS 920, 921, 922

These are three identical buildings constructed in 1959. Each building has 1900 SF. They were originally built for ammunition assembly which primarily consisted of bolting rocket components together prior to use. All three buildings are presently vacant and empty.
Each of the three buildings has a simple bathroom consisting of a:

- Toilet
- Lavatory

Multiple inspections were set up for this site, but no one showed up. Therefore, no follow-up information was found. Pictures of the current buildings are shown below in Figures 3-5.

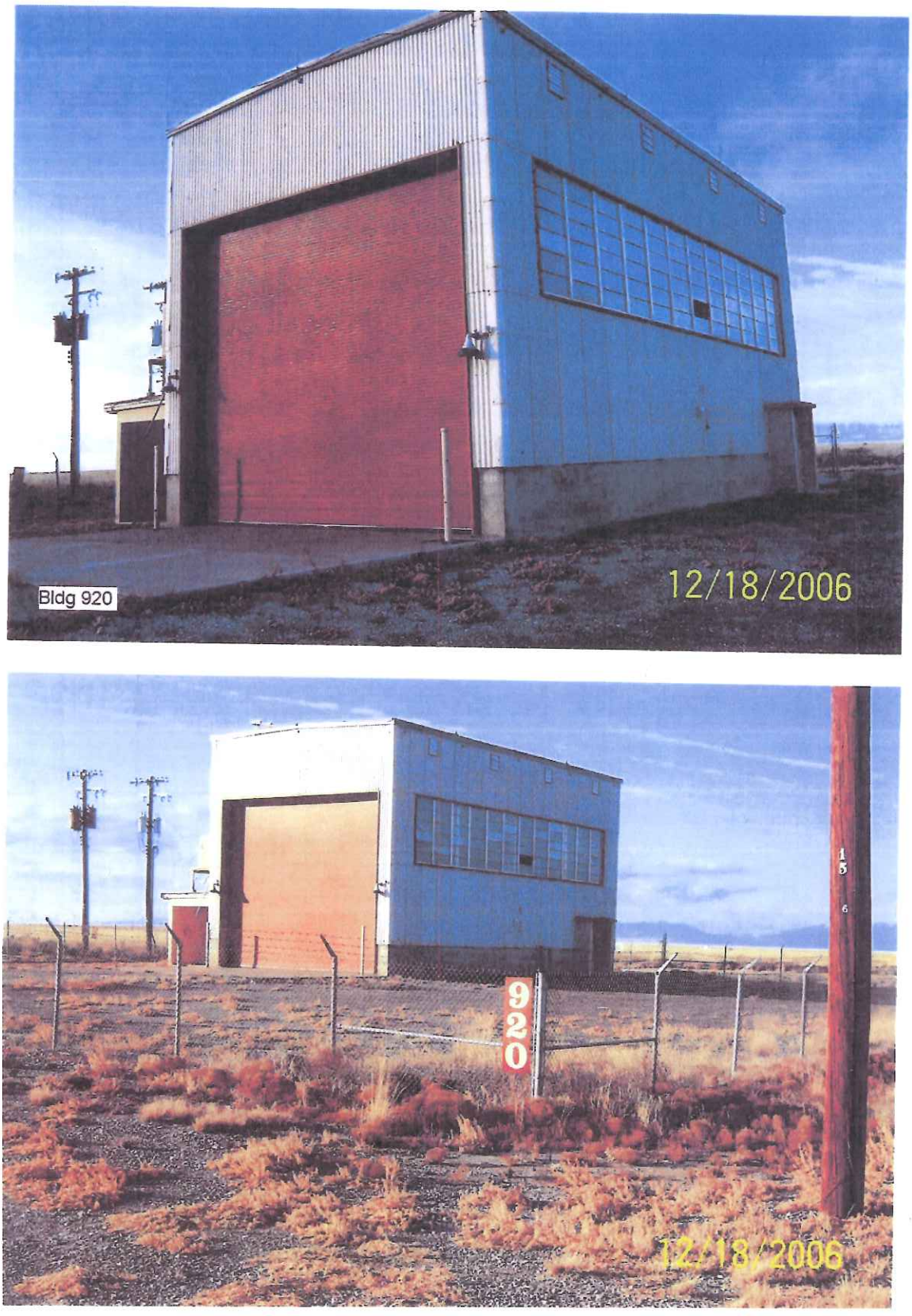


Figure 3: Pictures of Bldg. 920

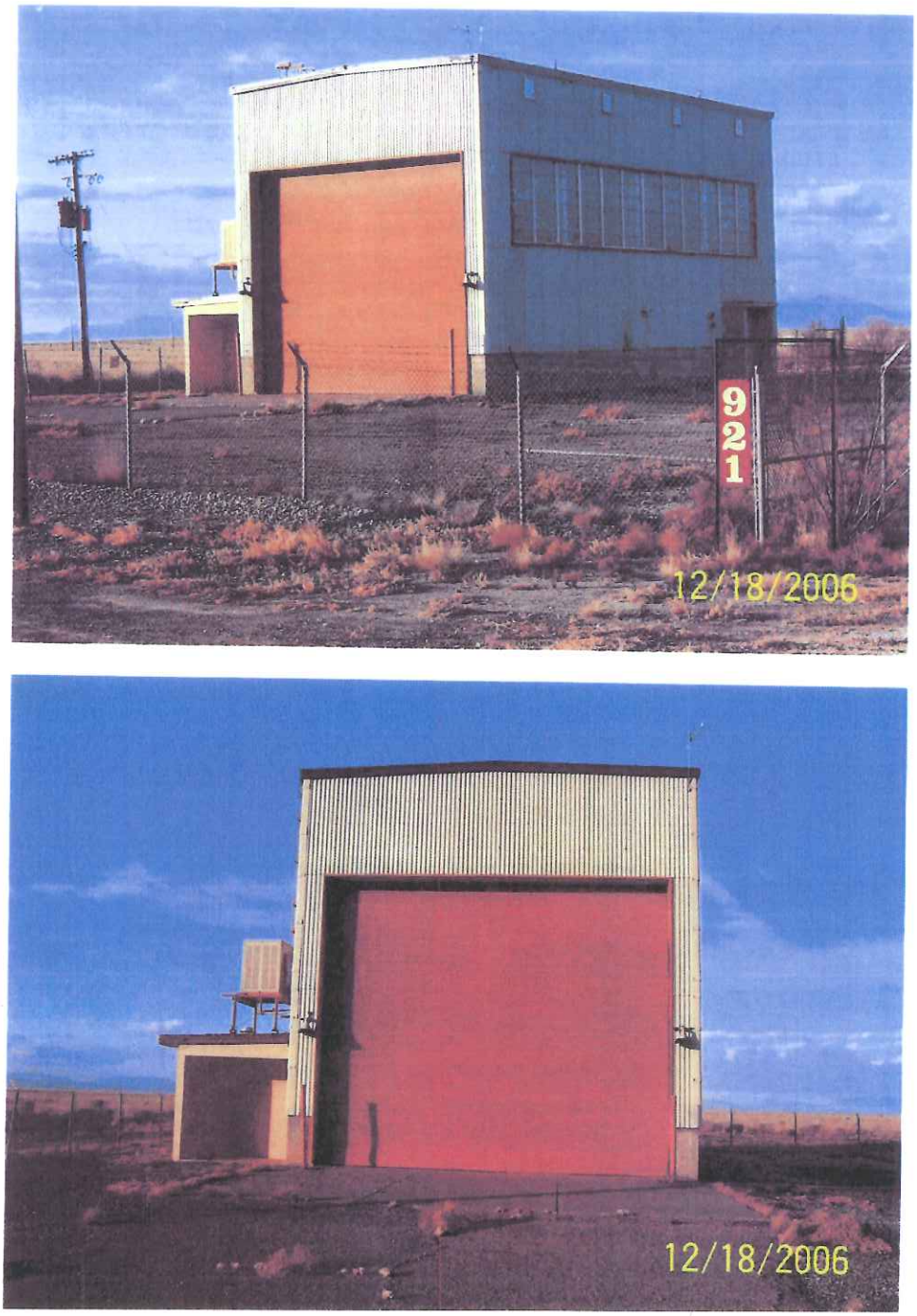


Figure 4: Pictures of Bldg. 921

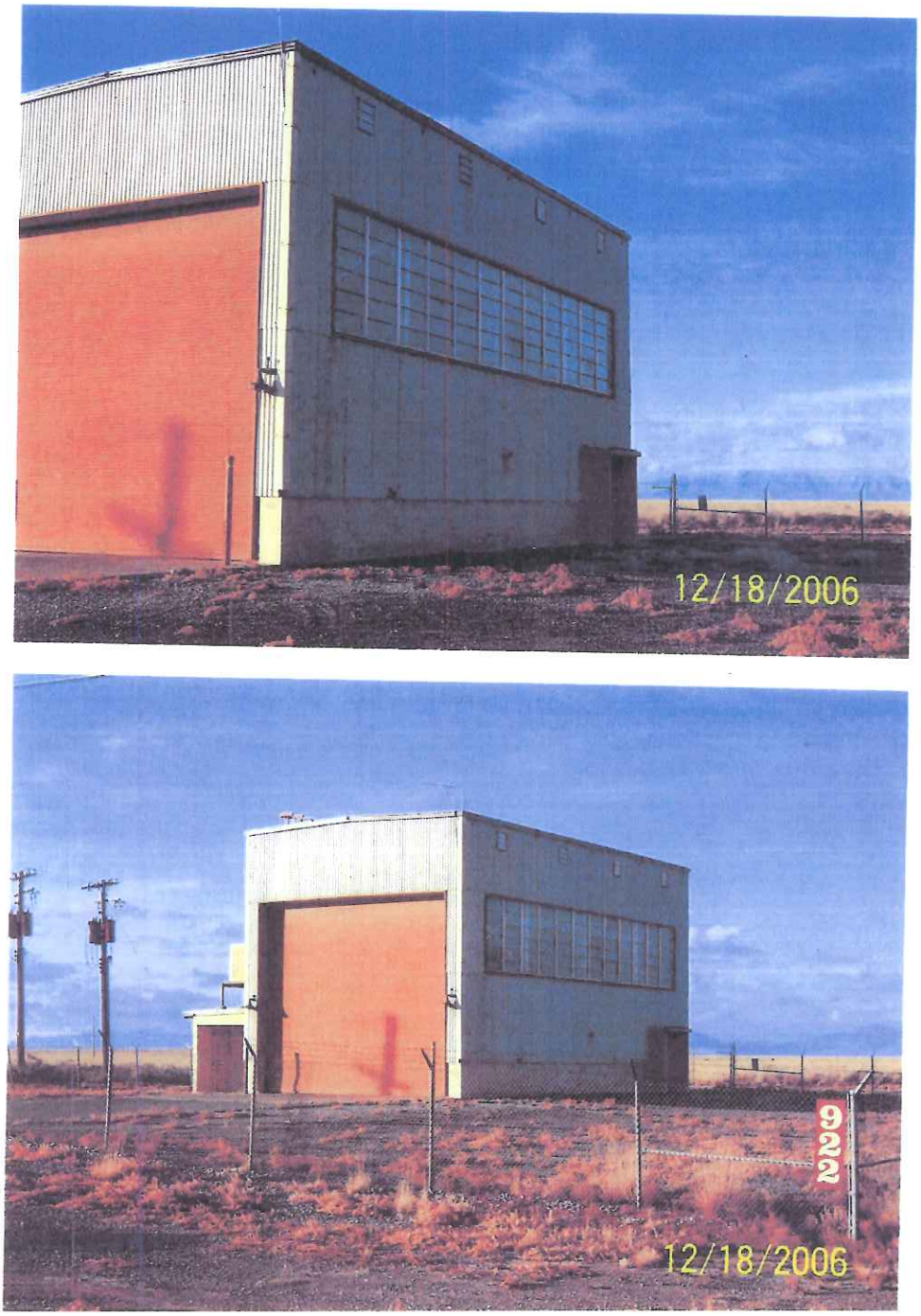


Figure 5: Pictures of Bldg. 922

INACTIVE SEPTIC SYSTEMS

BUILDING 924

This building was constructed in 1959 and has 4800 SF.
The building's original service was ammunition assembly similar to buildings 920-922.
It was later used for maintenance of radar tracking equipment.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

An on site inspection was done for this building on 20 Dec 2007 with the current facility manager, Mr. Michael Tackett. He did not have any information about the history of the septic tank system. Currently the building is being used for munitions storage. For the past two year it has stored rocket motors for the test track. From the on site inspection and drawings (Attachment 4-6) it can be seen that the bathroom drain is separate and there are no floor drains.

There are no pictures on file of this building.

INACTIVE SEPTIC SYSTEMS

BUILDING 1091

Site Description: There are no current files on this building because the building has been demolished. The building served as the Airfield Control Tower until replaced by the present Control Tower
On Attachment 55b a drawing of where the leach field was located in 1984 can be seen.
Grid Coordinates: J.9, 10.2
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: No secondary containment associated with underground storage tank
Probable Spill Route: Leakage from underground tank will contaminate water table in local vicinity

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 / UST

There were also three drawings that were discovered during the research stage of the project. The drawing (Attachment 7) shows the Septic Tank Details, Septic Tank Drain Field and the Drain Field Details.

INACTIVE SEPTIC SYSTEMS

BUILDING 1097

Specifications and history of this building are given in the following "Cold War Survey: Holloman Air Force Base". Along with this survey an on site inspection was done on 28 November 2007 with the current facility managers, A1C Clinton Bennett and TSgt Robert Edyburn. During the on site inspection it was discovered that the bathroom is separated from work area drains. In the past the building was used as a communications work center (office space) until 2005. There are no floor drains in the work area. It is currently being used as a houses base for a radio system network. There were also three drawings (Attachment 8-10) that were discovered in the investigation phase of the project. The drawings show the Materials Septic System, the Septic Tank Placement and Piping, the Latrine Plan, and the Mechanical Plumbing Plan.

Facilities in this building consist of:

- Toilet
- Urinal
- Lavatory

Description: Communications facility
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: None
Probable Spill Route: Leaks dissipate in local area on ground

Tank Location: South of facility
Fuel Flow – South/West

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 /AST
	500 gal each/ 1 /UST (Abandoned)

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Communications, Receiver.
Historic: Transmitter/Receiver.
Street Address: 1432 Sabre Road, HAFB, 88330-7842.

Building Number: 1097

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [ ] Minor [ ] Moderate [x] Major

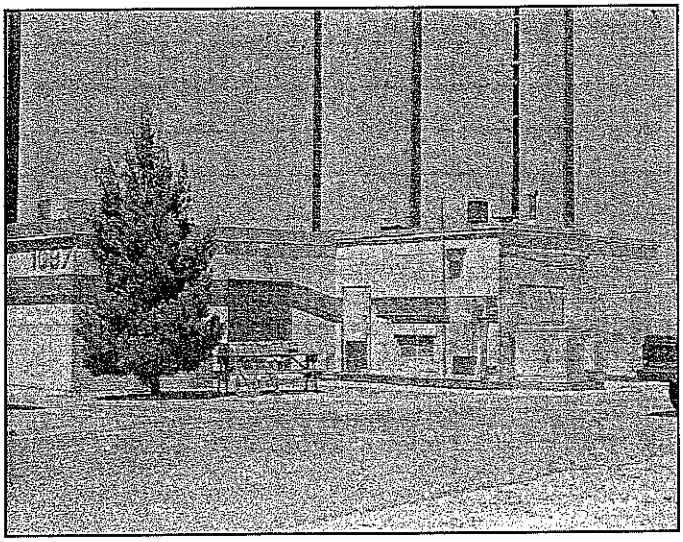
Comments:

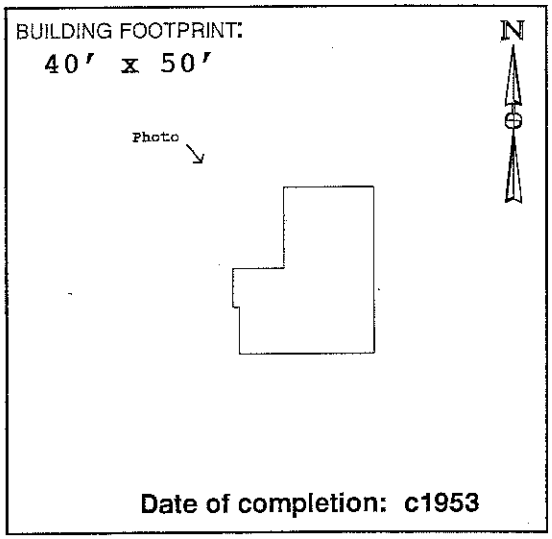
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1097 has not retained historic integrity.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1953

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1097 is a small transmitter building designed with few embellishments for utilitarian use only. Building 1097 originally had a rectangular footprint identical to Building 1098 and Building 1095. The original floor plan was sectioned into 4 rooms. An addition was constructed at the west elevation in 1986 using compatible structural and architectural components (CE File #1097-1). Both the builder and the architect are unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1097.

Current Function: Receiver/Air Traffic Control/Radio Control.

Original Function: Transmitter/Receiving/Communications.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1098-1 (c1952).

Foundation: Concrete wall footing. Concrete slab on granular fill.

Exterior walls: Painted concrete masonary units (CMU).

Roof: BUR on 2" rigid insul.; 2" poured gypsum on gyp board sup. by steel joists.

Notable interior features, including machinery:
Construction drawings document *"UHF Radio Air/Ground Facilities AN/GRC-27"*.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:
Continues to function as a communications facility/receiver site.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1097 has served as a Base communications facility since its completion c1953. Several renovations have resulted in a loss of historic integrity for this building. Building 1097 is no longer eligible for the National Register of Historic Places.

VII. ASSOCIATED BUILDINGS:

Location plan CE File #1098-2 identifies at least three north area transmitter sites. Building 1097 was associated with transmitter Building 1098. This facility is also associated with the flightline, and with communications Building 221.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building #1097 retains its original function as a radio receiver facility, however it has been modified to accommodate electrical, mechanical, and equipment additions and change-outs. Original equipment has been replaced.

Office space was added to the south elevation (1986: CE File #1097-1). All six windows at the north, east and west elevations have been blocked in. Original doors have been replaced. Vinyl floor tile covers original tile throughout. Dropped ceilings have been added.

This building, although retaining historic significance as a receiving site, has lost integrity of design, materials, workmanship, and association with its period of significance. Note: A Sgt. Boots (extension 3132) was identified by Building 1097 personnel as being a possible source for oral history research concerning specific activities associated with this facility.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Office space added to the west elevation (c1986: CE File #1097-1).

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Construction of adjacent buildings has altered viewshed.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Windows have been blocked in.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: An addition obscures the original west elevation. The original window treatments removed. Dropped ceilings added. Original asphalt floor tile covered.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: The presence of interior communications equipment and exterior poles contribute to the integrity of feeling as a radio site.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

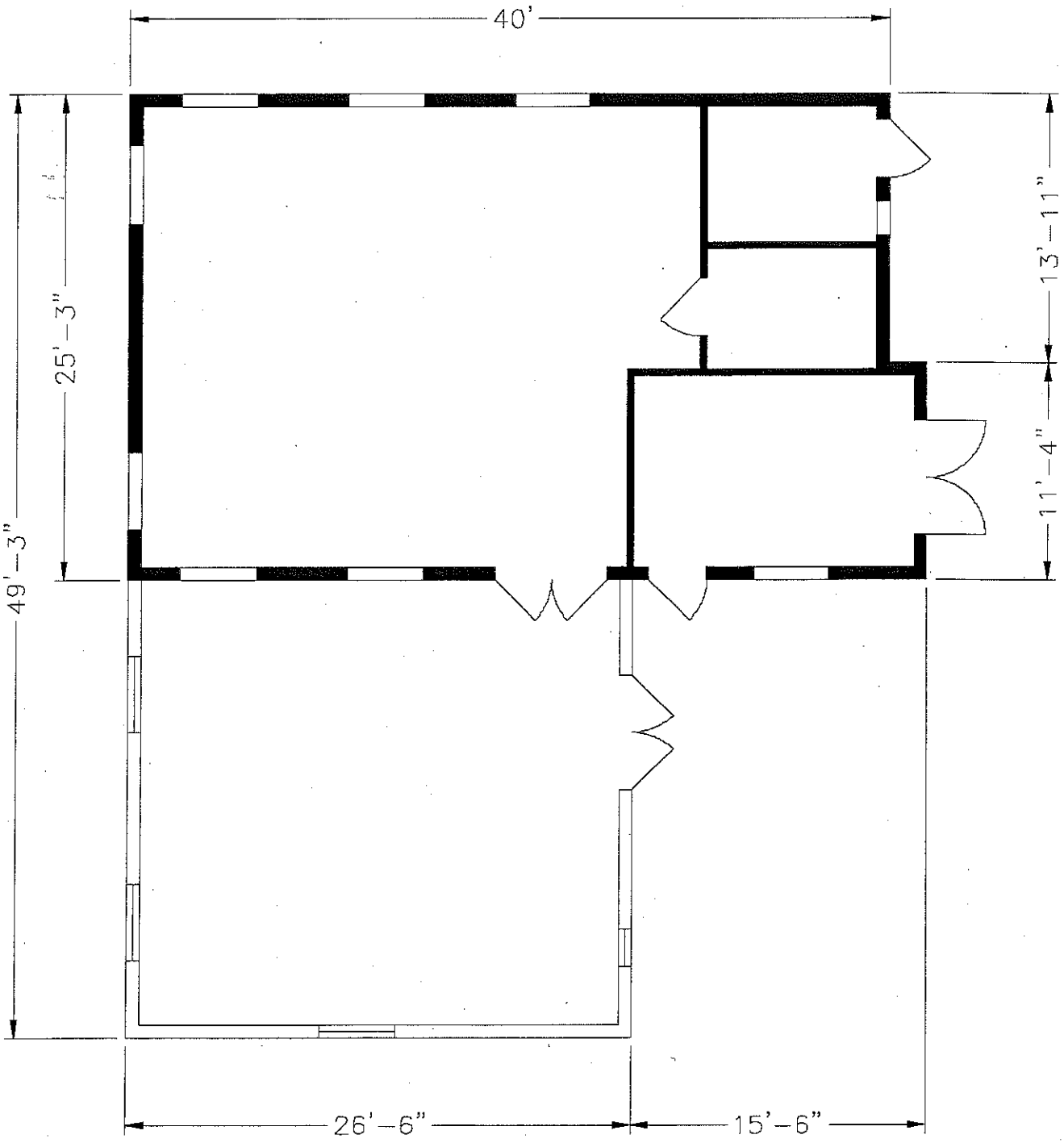
Comments: Original equipment has all been replaced.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #81**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



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Source: CE File #1098-2 (c1971)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1097** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1190

This building was constructed in 1952 and demolished in 2002. Specifications and history are provided in the "Cold War Survey".

The only drawing discovered was the plumbing floor plan and it can be seen in Attachment 11. Attachment 55d shows the current location of the leach field in 1984.

2002 Demolished Due To Unrelated Condition

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Security Police Building.
Historic: Change House/Unconventional Fuel Storage.
Street Address: 1514 Lethal Road, HAFB, 88330-7840.

Building Number: 1190

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1190 is in need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

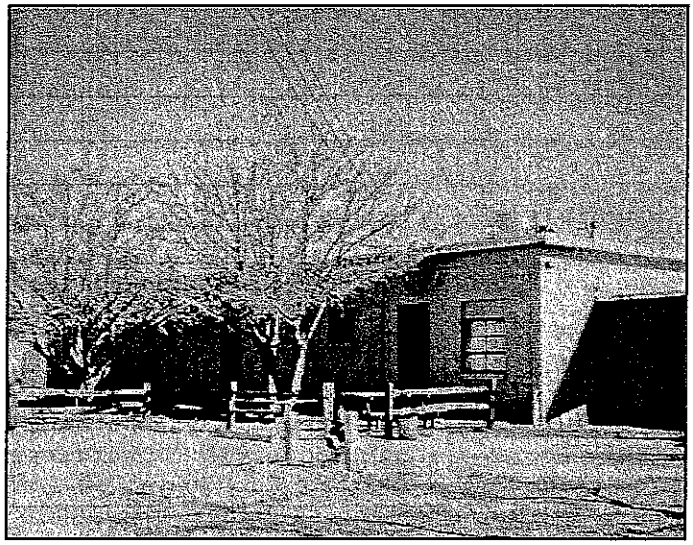
Comments: Interior partitions have been removed (date unknown).

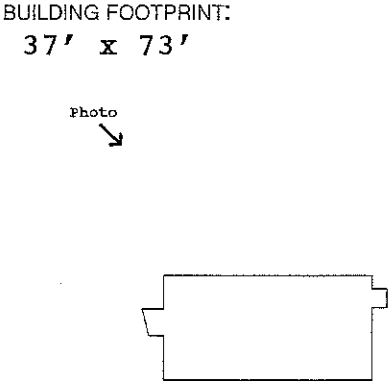
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1190 is a single-story, flat-roofed, concrete masonry unit (CMU) building exhibiting large roll-up equipment doors, numerous personnel access doors, and asymmetrical window fenestration. Construction drawings prepared in 1951 were stamped "As-built" but were not stamped in the revision block. Real Property Accountable Record/1190 indicates that Building 1190 was completed c1952 as a Change House for unconventional fuels personnel. W. C. Kruger Company (Santa Fe, NM) provided the construction drawings stored in CE File #1190. The builder is not known. A comparison of the current building and original blueprints reveals that no structural modifications to the building have occurred.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1190; CE File 1195-1 (c1951).

Current Function: Security Police operations.

Original Function: Change House, Unconventional Fuels.

Interim Functions: "RC Con House" (n.d.); "Prpln R-L Fuel/Lub" (n.d.); Prop Res Lab Rocket" (n.d.); "Prpln R-L Rkt" (n.d.); Sp Operations (n.d.).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1190-1 (c1951).

Foundation: Poured concrete footings and grade beams; concrete slab.

Exterior walls: Concrete masonry units (CMU).

Roof: (Built-up) gravel on rigid insul.; 2" slab sup. by metal lath and steel joists.

Notable interior features, including machinery: Shower stalls, locker room, dressing room, and laboratories.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

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VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Recommend reassessment of Building 1190 once the fifty-year construction date is met in the year 2002. This building retains historic integrity.

VII. ASSOCIATED BUILDINGS:

According to CE File #1190-1 *Title Sheet*, Unconventional Fuels Storage Building 1190 was associated with Building 1194 (Booster Inspection), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

This building retains all aspects of historic integrity. Although not meeting the "exceptional importance" standard imposed on buildings constructed within the last fifty years, Building 1190 remains potentially eligible as an individual property once the fifty-year date of construction is met in the year 2002. Recommend inclusion in a Multiple Property nomination along with the other unconventional fuels storage buildings. Building 1190 is currently being used as a storage and administrative facility by the 49th Squadron Security Police personnel. The original shower stalls, dressing room, locker room, shop, tools and supply rooms are all used for storage. Free-standing shelves have been installed to accommodate storage. As a result, some original doors and windows are blocked from view. Minor alterations have occurred at the interior. Two partitions have been removed. Glazed tile walls appear to have been added to at least one office. Vinyl tile has been installed over one section of the concrete slab in what once served as a machine shop. Some of the window panes have been painted. Because this facility remains potentially eligible, recommend that the original design features be considered in future modifications, and that photographs document any changes to the essential features. Suggested routine maintenance: Prune trees away from principal facade. Noticeable water damage warrants inspection of the roof. Replace broken window panes. Repair hole at exterior south elevation wall.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: Interior room layout as a Change House remains a key design element. This layout includes large open interior spaces, smaller labs/offices, and showers, dressing, and locker rooms used by unconventional fuels personnel.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Although no longer used as such, Building 1190 continues to be situated in the vicinity of other buildings historically associated with unconventional fuels testing and storage. This building appears to been recently landscaped.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two interior partitions removed. Glazed tile walls in office rather than CMU shown on original drawings.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Nearly all original workmanship remains visible, particularly at exterior.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Aside from the change in operations occurring here, Building 1190 remains essentially as it was originally constructed.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

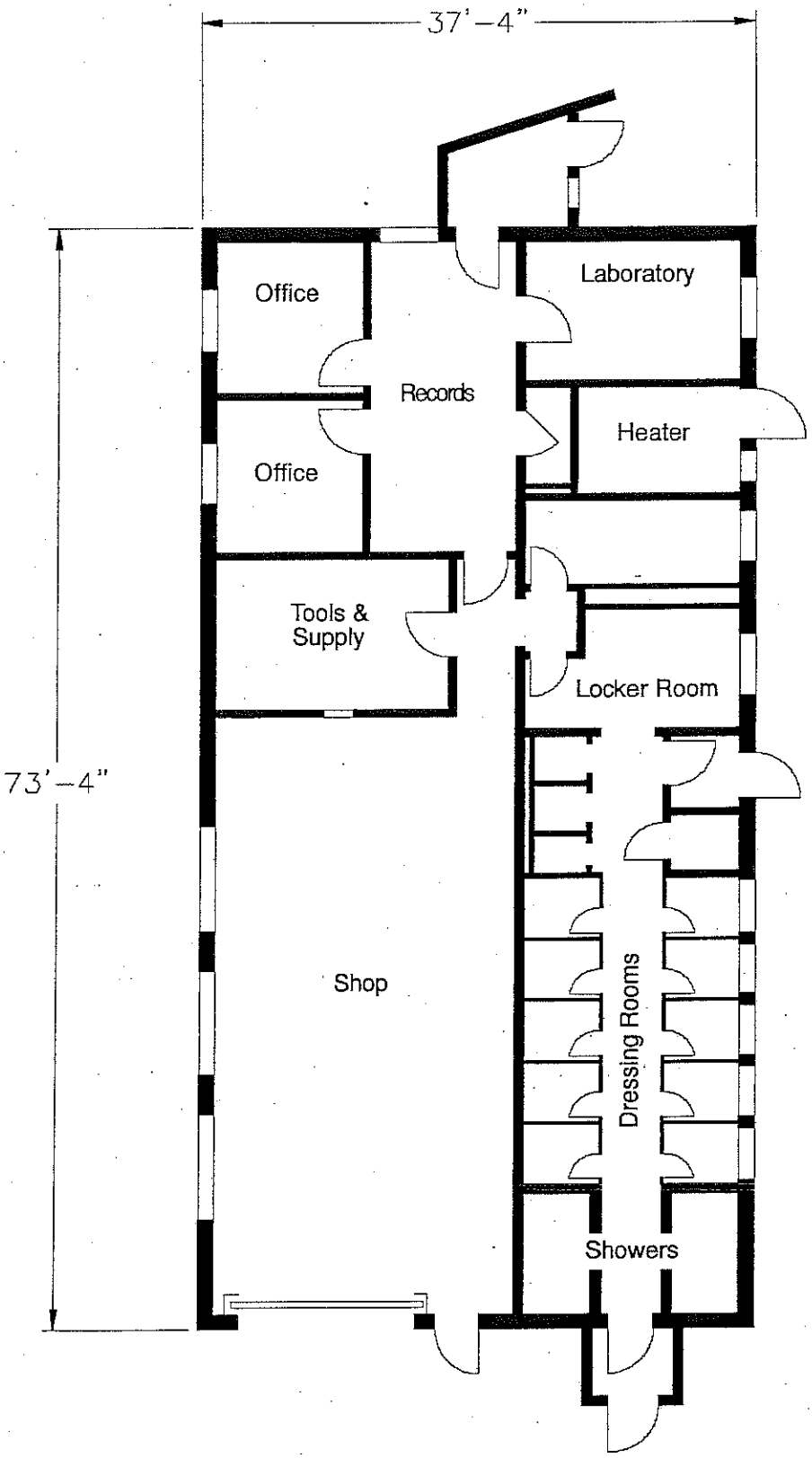
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #-Photo #**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1190-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1190** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Mike Gardner* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1194

Specifications and history are given in the "Cold War Survey".
Facilities in this building consist of:

- Toilet
- Lavatory

An on site inspection was done on 7 Jan 08 with the current facility manager, SSgt Joshua Roberts. In the inspection it was noted that the bathroom is separated from the work area drain. There was no history known. The building is currently being used for storage and it has been used for storage and has been used for storage for the past ten years.
Attachment 55d shows where the leach field for Bldg.1194 was located in 1984.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME: **Building Number:**

Current: Research Equipment Storage.

Historic: Booster Inspection/Unconventional Fuel.

Street Address: 1584 Lethal Rd., HAFB, 88330-7840. **1194**

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1194 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

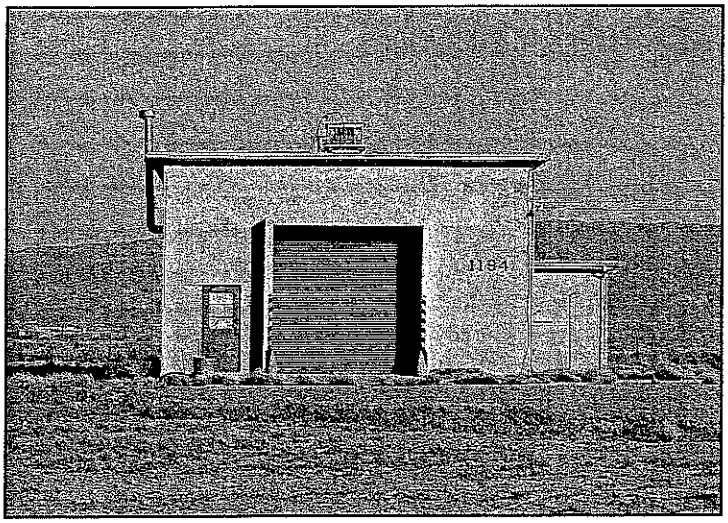
Comments: Interior partitioning is reversible.

Preliminary Determination of National or State Register Eligibility:

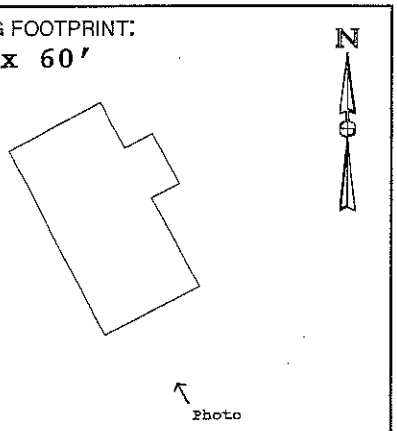
[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.



BUILDING FOOTPRINT:
30' x 60'



Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1194 is a rectangular, single-story, high bay structure made of concrete masonry units (CMU) and exhibiting a flat roof. The principal elevation faces west, showing one large roll-up door, and one personnel door. One row of windows is located below the eave line at the north and south elevations. The ceiling at the interior is exposed. "As-built" construction drawings show that Building 1194 was completed in 1952. W. C. Kruger Co. (Santa Fe, NM) provided the architectural work (1952: CE File 1194). The builder is unknown. No structural modifications to the original structure were noted.

III. HISTORIC AND CURRENT USE:

Current Function: Research equipment storage.

Original Function: Missile Assembly Test Building/Booster Inspection.

Interim Functions: "Mls/Space Rsch Tst" (n.d.); "M/Assembly Test Bldg" (n.d.); "Shp Wpn and Rlse Sys" (c1976); "BE Stor Cv Fclty" (n.d.); "Rsch Equip Stor" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1195-1 (c1952).

Foundation: Poured concrete footings and stem wall. Slab on compacted fill.

Exterior walls: CMU between concrete columns and bond beams.

Roof: BUR gravel. Rigid insulation. 2" concrete deck supported by steel joists.

Notable interior features, including machinery:

4-ton Wright Company chain-operated crane and hoist system, hoist no. 5197, serial no. 4925. The hoist is attached to a runway "I"-beam (crane) supported by steel support beams. Large metal roll-up doors at east and west elevations.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

210

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1194, although not meeting the "exceptional importance" standard, may be eligible for the National Register for its role in early Cold War materiel development once the fifty-year construction date is met in 2002.

VII. ASSOCIATED BUILDINGS:

According to CE File #1195-1 (c1951) *Title Sheet*, Building 1194 was associated with Building 1190 (Change House), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1194 remains essentially as it was constructed c1952. The original floor plan layout included one main room and an equipment room. A small area in the northwest corner of the main room has been partitioned. No documentation was found pertaining to this modification. This minor partitioning of the main room is reversible. This building is no longer associated with either missile assembly and test activities or unconventional fuels storage, and currently serves as an equipment storage room for the 6585th Test Group. Construction drawings (1956: CE File # 1194-1) show that an addition to this building was planned. There is no indication that this addition was ever built. Because this building retains historic integrity, and may be eligible for the National Register under Criteria A and/or C once the 50-year construction date is reached in the year 2002, recommend that future modifications take essential design features into account. Note: One isolated occurrence of prehistoric artifacts was noted on the grounds north of the building, including one white chert core, and one secondary chert flake.

Suggested routine maintenance: Scrape, prime, and paint the exterior. Replace downspouts. Prune landscape plantings away from foundation.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Construction drawings show plans for an addition to the north elevation (1956: CE File #1194-1). There is no evidence that this addition was ever built.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The high open-bay floor plan allowing the crane and hoist system, and the large metal equipment roll-up doors remain as key design elements.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Buildings 1193 and 1194 remain in an unmodified and isolated setting.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Nearly all of the historic materials used to construct this building remain visible.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two doors have been replaced. All windows appear to be original. Interior partitions at the northwest corner divide the original floor plan.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Although retaining its original open floor plan, this building is currently used for storage of modern equipment.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

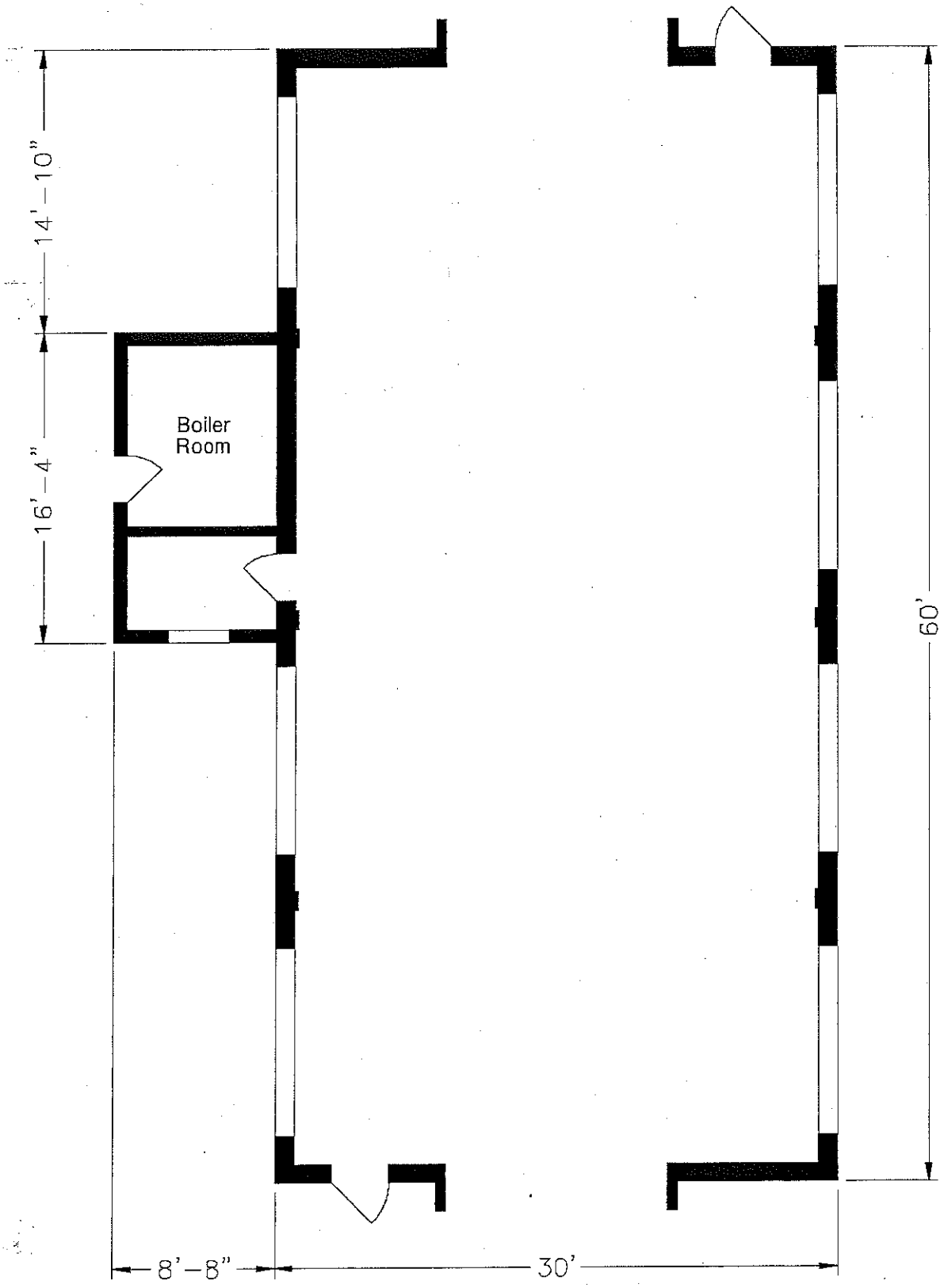
Comments: The open floor plan, isolated setting, hoist system, and nearby continuity check stand (Building 1193) contribute to this building's integrity of association.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #3-Photo #31**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1195-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1194** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1196

This building was constructed in 1956. It originally built for missile assembly, but is now in communications equipment storage.
The original facilities consisted of:

- Toilet
- Lavatory

These facilities were replaced in 1975 with:

- Toilet
- Urinal
- Lavatory

An on site inspection for this building was done on 4 Dec 07 with the current facility manager Sgt Lander. The information gathered from this inspection was that there were not any floor drains located within the building. In the past it was used for TAC can and for the past ten years it has been used for storage.
Attachment 55d shows where the leach field for Bldg. 1196 was located in 1984.

Figure 6: Picture of Bldg. 1196

INACTIVE SEPTIC SYSTEMS

BUILDING 1199

This building was constructed in 1957. It was originally built as a rocket fuel laboratory. In 1987 it was converted to the Security Forces Kennel.
As the fuels laboratory, it contained:

- Toilet
- Urinal
- Lavatory
- Shower

After conversion to the kennel, the facilities were changed to:

- Toilet
- Urinal
- Stainless Steel Sink

During the investigation stage of the project there were drawings found for building 1199. Attachment 12 and 13 are of the Site Plan, the Sewer Isometric, the Plumbing Plan and the Floor Plan.

Along with the drawings that were found an on site inspection was completed on 29 Nov 07 with the current facility manager, SSgt Gilmore. A new Security Forces Kennel area has been built and now the building is currently being used to house animals until they can be transferred to Alamogordo Animal Control.

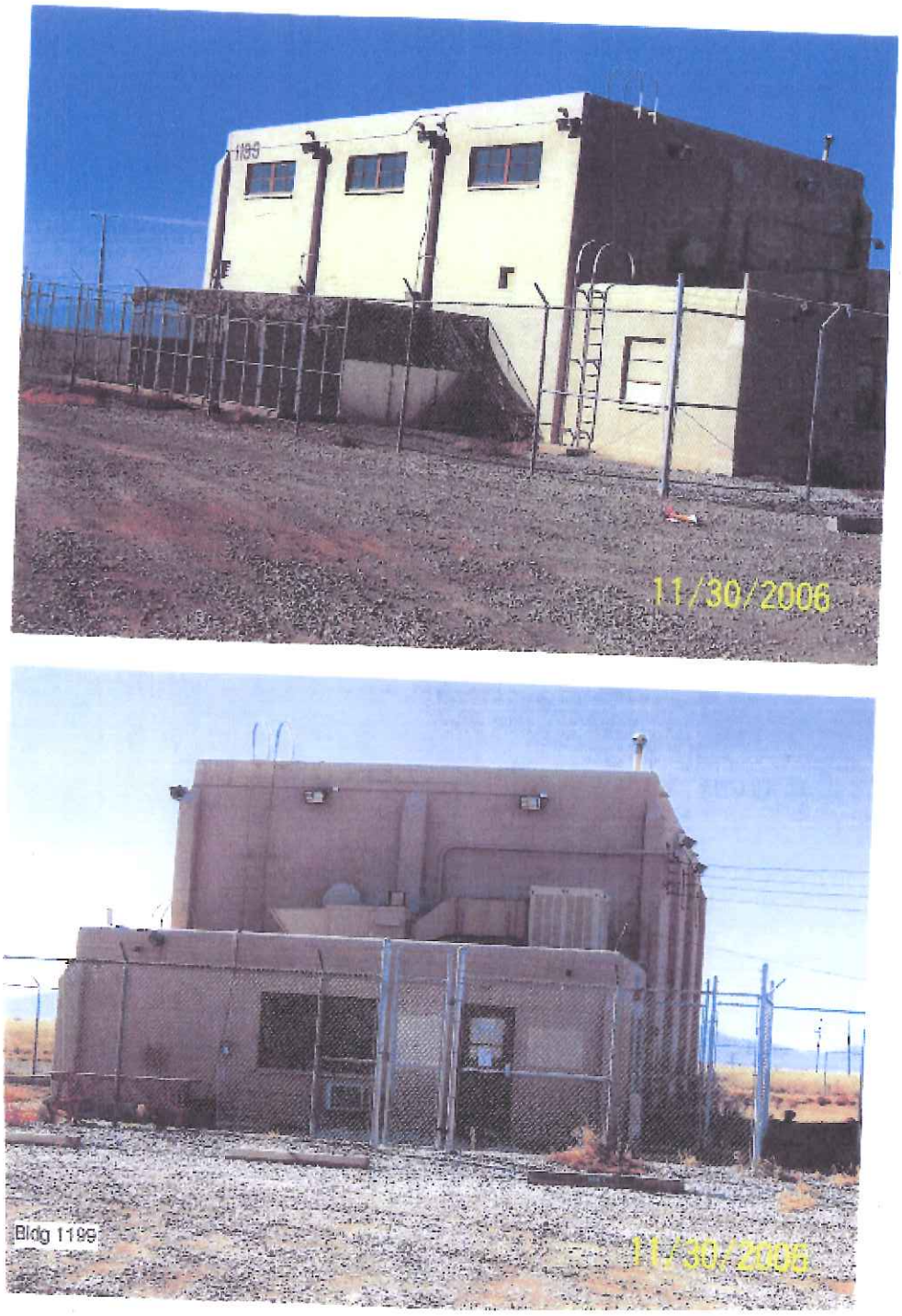


Figure 7: Pictures of Bldg 1199

INACTIVE SEPTIC SYSTEMS

BUILDING 1200

Specifications and History: See "Cold War Survey".

Three drawings were found for this building. These drawings show the Plumbing Floor Plan (Attachment 14), a Floor Plan (Attachment 15) and the Septic Tank and Drain Field (Attachment 16).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab, Medical (VACANT).
Historic: Space Biology Laboratory.
Street Address: 841 Douglas Road, HAFB, 88330-7823.

Building Number: 1200

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [ ] Needs maintenance [x] Deteriorated [ ] Archaeological

Comments: Building 1200 is abandoned, and showing signs of deterioration.

Degree of Alteration: [ ] None [ ] Minor [x] Moderate [ ] Major

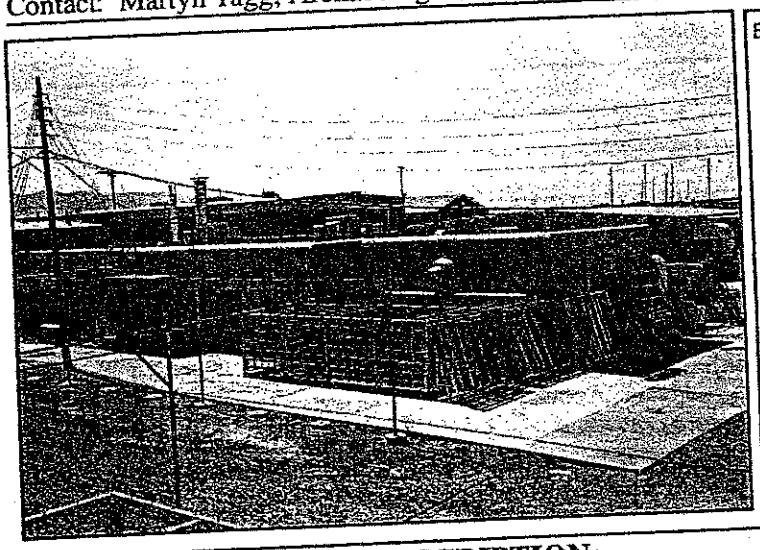
Comments: Alterations are architectural rather than structural.

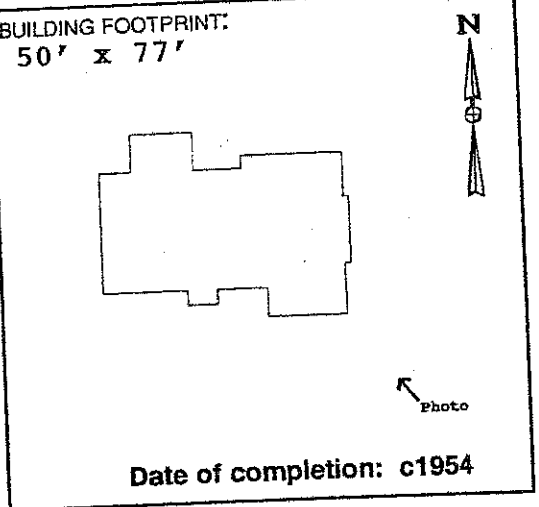
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1200 no longer retains historic integrity. See Section VI.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1954

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II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1200 is a rectangular, single-story, flat-roofed concrete masonry unit (CMU) building constructed as one of several laboratories dedicated to important aeromedical research using both animals and humans. None of the construction drawings were correctly stamped "As-built." According to Real Property Accountable Record/1200, the estimated date of construction is 1954. Subsequent improvements documented in CE File drawer #1200 include an addition to the medical lab (c1958), a covered passageway added to the boiler room (c1957), and a frame wall addition to the surgery room (c1957). Neither the builder nor the architect is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1200; Field visit Summer 1995.

Current Function: Vacant.

Original Function: Space Biology laboratory/Animal experimentation.

Interim Functions: Animal experimentation/Storage.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1200-1 (c1953).

Foundation: Concrete wall footings. Concrete slab on fill.

Exterior walls: Painted concrete masonry units (CMU).

Roof: BUR on concrete deck, supported by metal lathe and steel bar joists.

Notable interior features, including machinery:

Originally used as a medical laboratory, with work tables, work benches, built-in lockers, cabinets, operating tables, x-ray tables, etc.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:

274

One room is currently being used for storage. All medical and laboratory equipment has been removed.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Due to extensive alterations to the exterior, Building 1200 no longer retains historic integrity. Recommend, however, that this building be considered as a contributing feature in a basewide early Cold War National Register of Historic Places Multiple Property nomination.

VII. ASSOCIATED BUILDINGS:

Building 1200 was an integral part of Holloman's aeromedical facilities, including Buildings 1201, 1202, 1203, 1204, 1205, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Since its original construction c1954, Building 1200 has been used as a laboratory and medical facility for a wide variety of research animals, including trout, black bear, dogs, mice, and chimpanzees. Although currently abandoned, this building featured a lead-lined x-ray room, an autopsy room, an observation room, a surgery room, a dark room, and animal pens (c1954: CE File #1200-1). Built-in steel lockers, metal cages, x-ray tables, work benches, food bins, operating tables, scrub sinks, surgical lamps, sterilizers, etc. have been removed. Two exterior doors have been blocked in, and thirteen exterior windows have been blocked in. One exterior door and one exterior window have been added. Interior walls have been added, removed, or relocated. A storage room has been added to the south elevation. Animal cages remain at the west elevation. The presence of dead rodents, foul odors, torn pipe and duct insulation (possible containing asbestos) and peeling paint (possible lead-based) represent hazards to health and safety. Because of the unique and important nature of the research conducted here, recommend that this building be nominated as a contributing feature as part of an HAFB early Cold War National Register Multiple Property nomination.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?
[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.
Comments: The building has been located at its present location since c1954.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?
[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact
Comments: Most of the original doors and windows have been removed. All of the equipment has been removed. Most of the original finishes have been obscured.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting
To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting
Comments: Continues to be situated in an isolated setting with the other Aeromedical facilities.

Materials: To what extent have the original materials used to construct this structure been retained?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Elevations have changed due to modified openings, an addition, and a covered passageway. Interior wainscot and cornice removed, wall tile added.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Exterior walls and cages remain intact. Some architectural features remain. Most of the original interior workmanship has been lost.

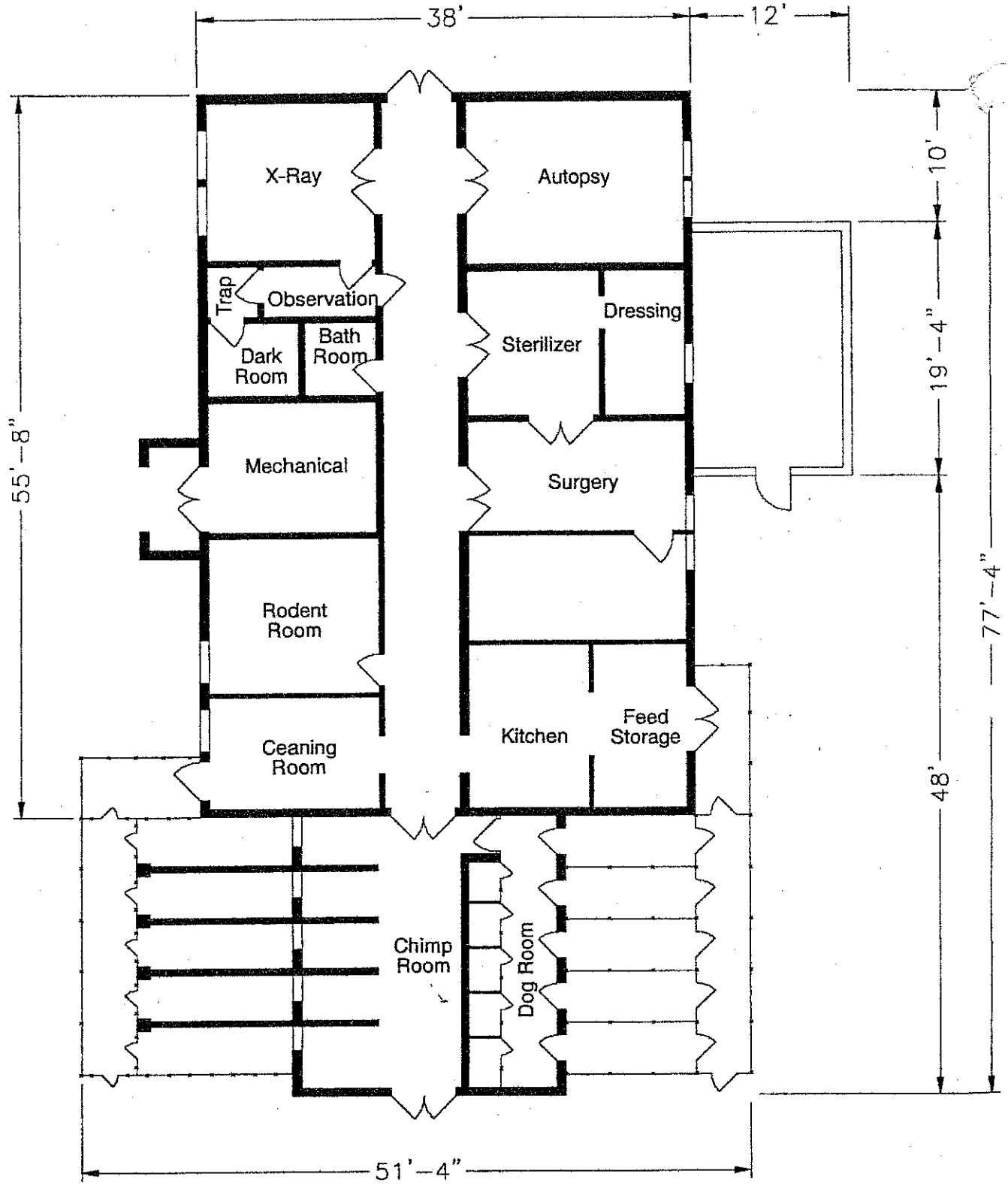
Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?
[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity
Comments: Building 1200 continues to be situated within the compound set aside for animal research. Chimpanzee research continues today in nearby buildings.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?
[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity
Comments: Although all of the equipment has been removed, this building still demonstrates a link with its past by virtue of its setting, the odors, and the animal cages.

X. FURTHER INFORMATION:

Surveyed By:
Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #94**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1200-1 (c1954)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1200** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

BUILDING 1201

Specifications and History: See "Cold War Survey"

Seven drawings were found for this building. These drawings show the Septic Tank and Absorbent Area Layout, Isometric Sewer Layout, Septic Tank Plan and Septic Tank Elevation (Attachment 17), Floor Plan (Attachment 18), Layout Plan (Attachment 19) and Systematic-Waste System (Attachment 20).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab Medical.
Historic: Aero. Medical Field Lab.
Street Address: 821 Douglas Road, HAFB, 88330-7823.

Building Number: 1201

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Structurally intact. In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

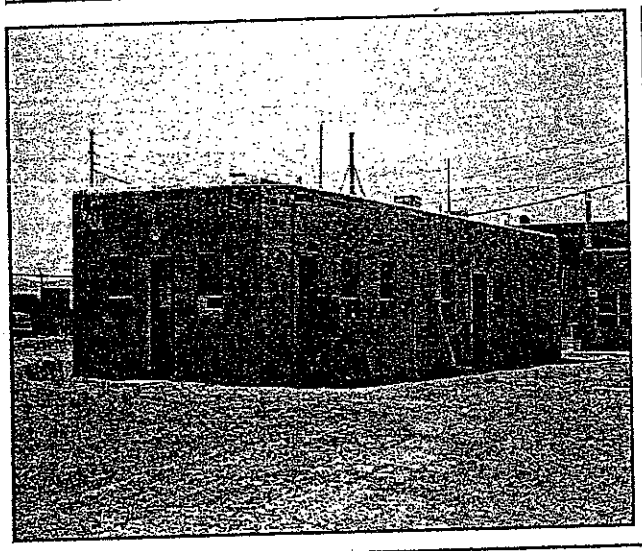
Comments: Mortuary/autopsy room added as subsequent improvement c1958.

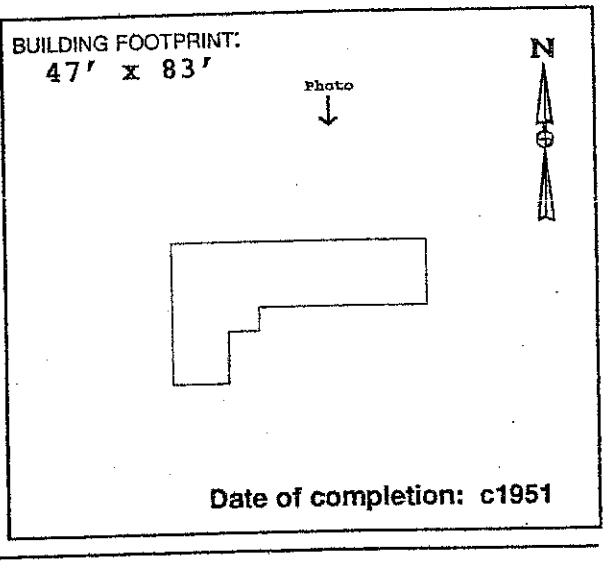
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible under Criteria A and/or C at a national level.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1951

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1201 is an "L-shaped", single-story, flat-roofed, building constructed primarily using painted 8" structural clay tile and exhibiting asymmetrical door and window placement. Animal cages occupy the west elevation. Real Property Accountable Record/1201 indicates that this science laboratory was constructed c1951. The construction drawings consulted were stamped "As-Built," although no date was given. Both the architect and builder are unknown.

At least two structural modifications may be viewed as subsequent improvements to the original building, including the addition of a Mortuary/ Autopsy Room (c1958: CE File #1201-4), and the addition of a rooftop observation deck (c1952: CE File #1201-5).

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1201.

Current Function: Carpentry shop; Employee break room; Office space.

Original Function: Aerospace Medical Lab; Animal experimentation.

Interim Functions: "SC Lab Human Eng" (n.d.); "SC Lab Med (c1968).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1201-1 (c1951).

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted structural clay tile.

Roof: Built-up roof w/ gravel on sheeting, supported by 2x12 wood joists.

Notable interior features, including machinery:

Fixed chain link cages, lab tables, equipment tables, work tables, wood storage bins, sterilizer, incubator.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL: (Based on field visit Summer 1995

[c1958 SUBSEQUENT IMPROVEMENT--MORTUARY/AUTOPSY]:

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted cement masonry unit (CMU).

Roof: 5-Ply built up roof on concrete slab. Steel joists.

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Notable interior features, including machinery:

Washer and dryer, kitchenette, tool room, table saw, furniture, lockers.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1201 is eligible to the National Register under Criteria A and/or C at a national level of significance for its vital role in early aeromedical research in support of the early Cold War space exploration mission.

VII. ASSOCIATED BUILDINGS:

Building 1201 was associated with the other Aeromedical facilities, including Buildings 1200, 1202, 1203, 1204, 1205, 1206, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1201 retains historic integrity as far as the structure itself goes. Very little physical evidence remains of this structure's original use as an animal laboratory. The cages have been removed. Two interior walls with doors have been added. One interior wall has been removed. Service sinks, work tables, wooden bins, an incubator, and other lab support items shown on c1951 construction drawings have been removed. An area of the original roof approx. 10' x 13' was reinforced with three inches of concrete for observation deck c1952 (CE File #1201-5). A mortuary/autopsy room was added c1958. These additions may be viewed as early improvements, and do not diminish Building 1201's historic integrity. Drawings itemize a "2-body" mortuary room, an autopsy table, a band saw, cabinets, a sterilizer, a photography area, and other laboratory equipment. This equipment has been removed. This room currently serves as a lounge area for employees. Due to the important research conducted here in support of this nation's space program, further research is warranted. Recommend that Building 1201 be included in a Cold War-era Multiple Property nomination. Suggested routine maintenance: This building is showing the signs of long-term neglect. Fill the stress cracks at the exterior corners. Scrape and paint exterior walls. Replace window glass and door hardware as needed.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Continues to be situated in an isolated compound.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Original structure essentially intact. Interior lab equipment and cages removed.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Enclosed by chain link fence topped with barbed wire, along with other research facilities. Chimpanzee research continues in nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Clay tile walls still intact. Some glass block windows remain. Some glass block windows blocked in when addition constructed. Floor tiles removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Roof, walls, and exterior openings remain essentially the same. The east elevation changed due to an early addition. Interior partitions, openings, and finishes have changed.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Historic photographs show that the natural, historic, and aesthetic character of Building 1201 has been retained.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

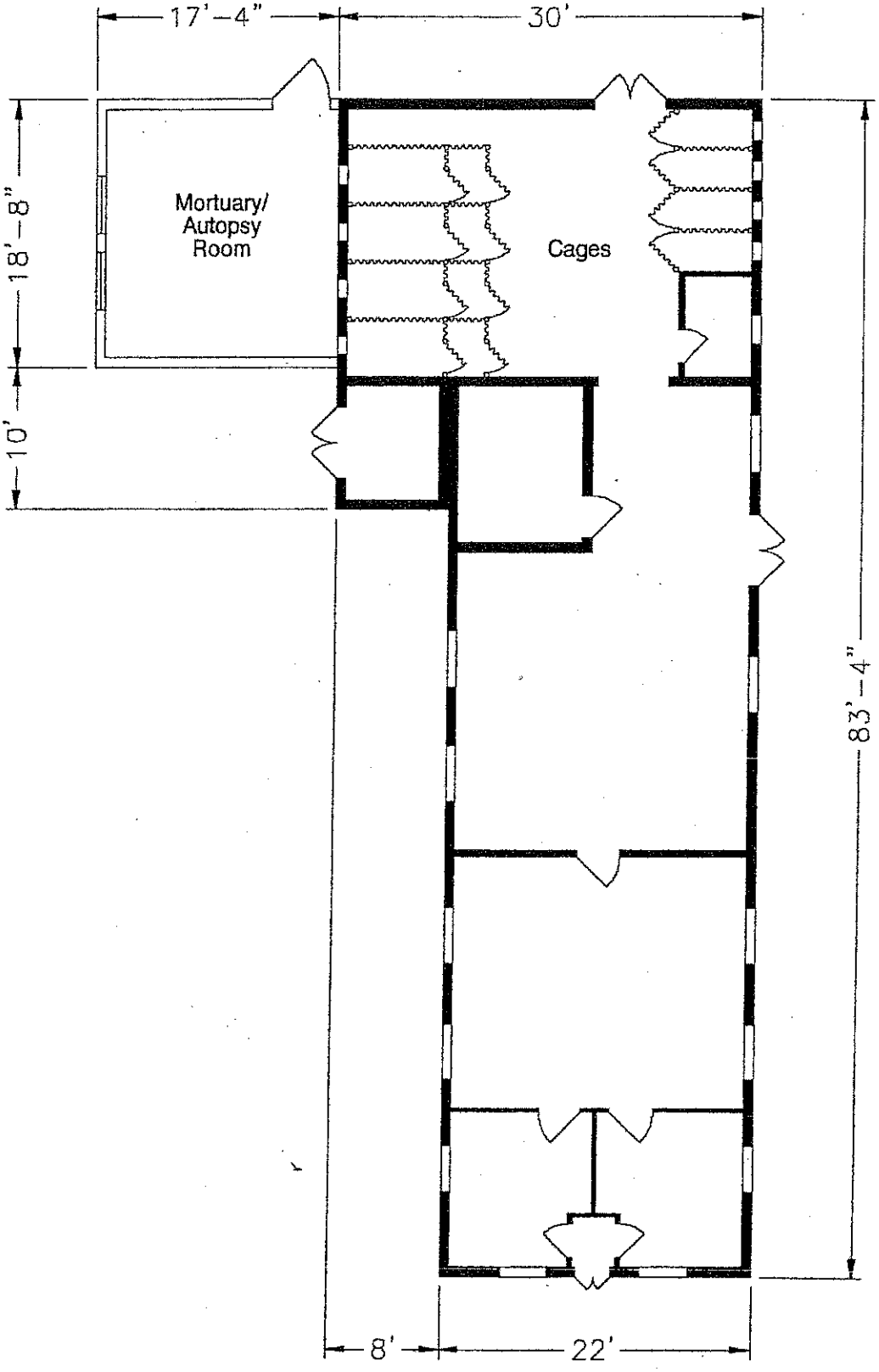
Comments: Building 1201 retains a visible link with its period of significance.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #91**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1995**



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Source: CE File #1201-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1201** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

Buildings 1219, 1221, 1235 and 1239
An on site inspection was completed on 20 Dec 07 with the current facilities manager, TSgt Pote, he has been the facilities manager for the past nine years. During the inspection it was discovered that there are sink holes on all leach fields in the compound. All buildings in this compound have separate drains for the bathrooms. All buildings are also currently connect to the base sewer system.
Attachment 55d shows the leach field location for Buildings 1219, 1221, 1235 and 1239.

BUILDING 1219

This building is the Administrative Offices for the Munitions Maintenance Squadron. It was constructed in 1985 and covers 4476 SF.
There are Men's and Women's Bathrooms that discharged into two (2) septic tanks prior to the installation of a sewer main that discharges to the Base Waste Water Treatment Plant.

INACTIVE SEPTIC SYSTEMS

Building 1221

This building is in the Ammo Depot and was originally constructed for ammunition storage. It was later switched to store inert munitions.
The building was constructed in 1983 and covers 2857 SF.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan (Attachment 21), Floor Plan (Attachment 22), Partial Plan (Attachment 23), Septic Tank Details and Sewage Disposal System (Attachment 24) and a Profile of Sewer Line Septic Tank and Disposal Field (Attachment 25).

INACTIVE SEPTIC SYSTEMS

BUILDING 1226

This is a munitions maintenance shop building constructed in 1985. It has 2945 SF of floor space.
Facilities installed include:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Utilities Plan (Attachment 26), Plumbing Demolition Plan (Attachment 27), Plumbing and HVAC Plan (Attachment 28) and Waster/Water Piping Detail (Attachment 29).

In Figure 8 on the following page it can clearly be seen where the leach field is in relation to where building 1226. This is the leach field for building 1219, 1221, 1235 and 1239 as well. In Attachment 46 (a map showing many of the building on Holloman AFB) it can be seen where building 1226 is in relation to these building.

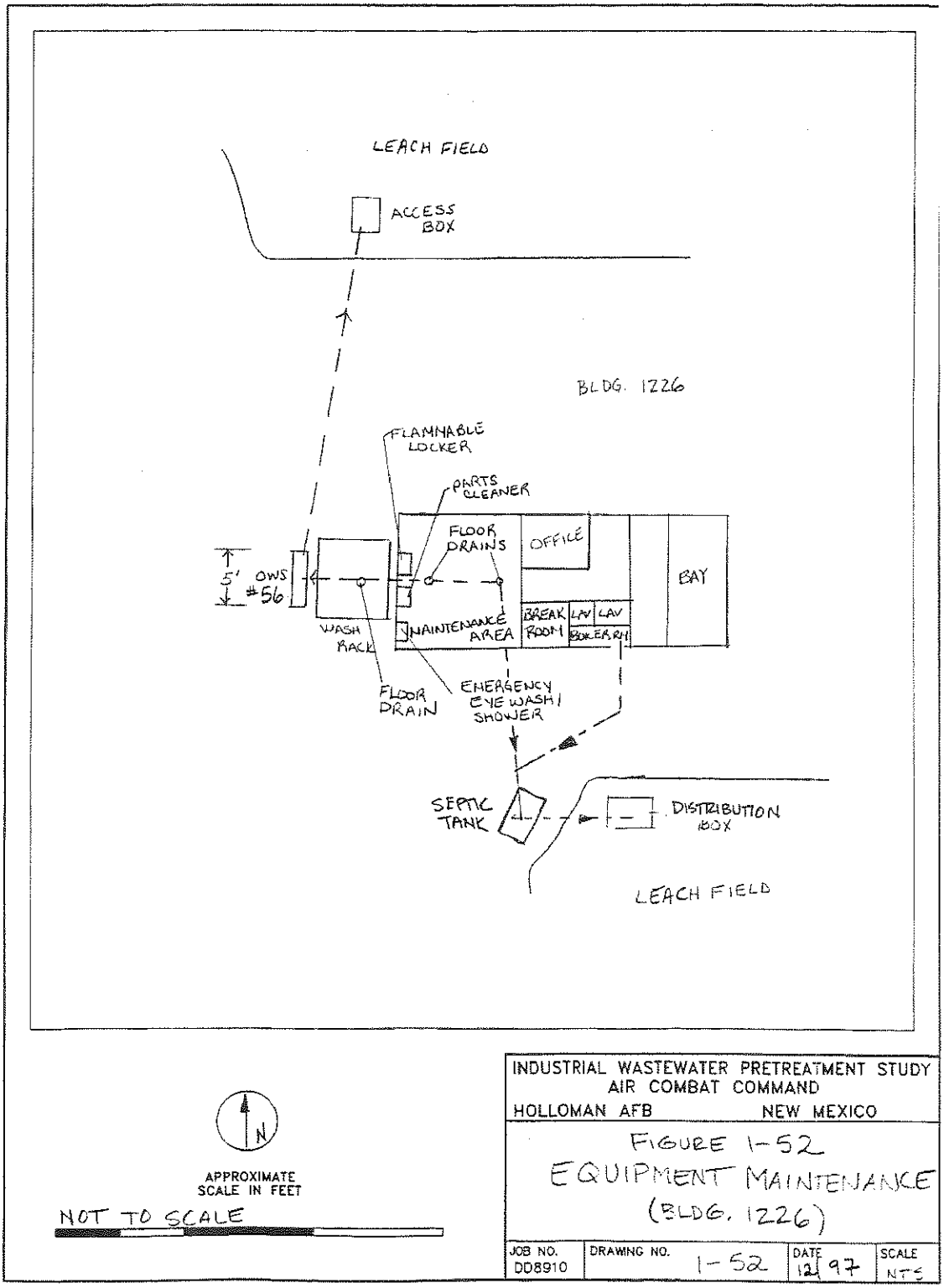

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Figure 8: Drawing of Leach field

INACTIVE SEPTIC SYSTEMS

BUILDING 1235

This building was constructed in 1964 and contains 3000 SF of floor space.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, a drawing for this building was also located. This drawing (Attachment 30) shows the Site Plan, Septic Tank Details and Sewer Clean Out.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST

INACTIVE SEPTIC SYSTEMS

BUILDING 1239

This is another building in the Ammo Depot. It was constructed in 1971 and contains 1920 SF.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Urinal
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan, Septic Tank Details, Utility Plan (Attachment 31), Floor Plan (Attachment 32), Grading Plan (Attachment 33) and Lavatory Detail (Attachment 34).

INACTIVE SEPTIC SYSTEMS

BUILDING 1250

This building was constructed in 1957 and contains 2890 SF.
It was originally a water pumping station. In 1985 it was changed into a storage facility. As part of the change in service the bathroom facilities were removed. Currently it has a large infestation of vectors and it is unsafe to go inside. The POC for this building is Mr. Chuck Price.
The original facilities consisted of:

- Toilet
- Lavatory
- Floor drains for the water pumps

INACTIVE SEPTIC SYSTEMS

BUILDING 1251

This building was constructed in 1965 and contains 1300 SF.
In the records it is listed as a Research and Testing Shop. It currently has a large infestation of vectors, therefore it is not safe to go inside. The building has been vacant since the mid 90's. The point of contact for this building is Mrs. Eisele.
It contains the following facilities:

- Toilet
- Lavatory

INACTIVE SEPTIC SYSTEMS

BUILDING 1269

This building was constructed in 1966 and contains 3262 SF.
The original service was a Medical Science Laboratory. It has been relegated to a storage facility.
The facilities consisted of:

- Toilet
- Lavatory
- Kitchen Sink with Garbage Disposal

Site Specific Contingency Plan: See Attachment 1

Max. Spill Quantity (gal): 55

Chemical	Container Type
Benzene	NA
Acetonitrile	

REMOVED SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	1102	1952	6'x4'x8'10"	2500
2	1103	1948	7'x9'x3'2"	1412
3	1108	1958	6'x9'6"x6'3"	750
4	1119			
5	1150	1953	4'x9'x6'3"	2500
6	1154			
7	1166	1960		450
8	1175	1949	5'1"x10'4"x6'10"	2970
9	1176	1959		640
10	1265	1992		1200
11	1173			

REMOVED SEPTIC SYSTEMS

BUILDING 1102

Specifications and History: See "Cold War Survey." More information can be seen in the drawings. The drawings that have been found for this building are as follows the Grading Plan (Attachment 35), Septic Tank Details and Boring Log Results (Attachment 36), Leaching Well and Cover Details and Sewer Clean Out (Attachment 37).

Attachment 55c shows where the leach field was located for this building in 1984.

This building has the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Missile Radar Station.
Historic: Radar Triangulation: King I.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1102

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

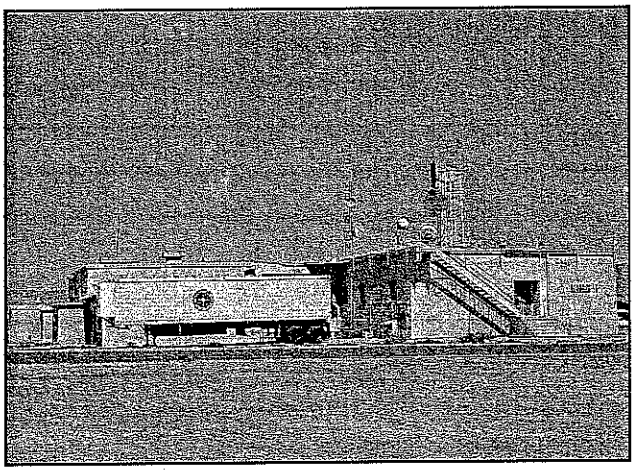
Comments: Essential structural and architectural features remain intact.

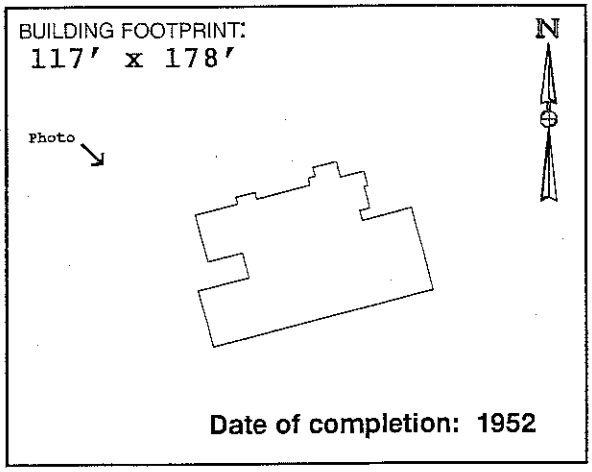
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Recommend listing as part of a Cold War Multiple Property.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1102 is a one-story concrete masonry unit, multi-shaped building with a central corridor running east-west the entire length and single rooms flanking both sides of the corridor. Original footprint shows primarily rectangular shape with a central projecting core. This core is a large open room with an upper balcony around its perimeter. Construction of the original building was completed in 1952, according to "As-built" drawings in CE File #1102-1. Surveillance display room added in 1969 (CE File #1102-1). It is unclear when north elevation additions constructed, although information in Real Property Accountable Record/1102 date the additions as being post-1970. The architect for this project was W. C. Kruger (Santa Fe, NM). The builder is unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1102.

Current Function: Telemetry and Optics. Altitude measurements.

Original Function: Missile Instrumentation Station; Mission Control.

Interim Functions: Missile Radar Station.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1102-1 (c1952).

Foundation: Concrete footing and foundation wall. Column spread footing.

Exterior walls: Concrete masonry units (CMU).

Roof: Bituminous concrete over built-up roof, ltweight concrete, supported by one-way concrete slab using concrete beams and steel beams encased in concrete.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

380

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Eligible under Criteria A and/or C at a national level of significance for important role in early Cold War-era missile and High Speed Test Track mission control and tracking. Further research recommended.

VII. ASSOCIATED BUILDINGS:

Building 1102 supported all missions at White Sands Missile Range and at Holloman Air Force Base until Building 300 and possibly 1527 at White Sands were constructed.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1102 continues to operate as a mission control building, with mostly optics and telemetry functions. The Flight and Instrument Control Room, and the Surveillance Radar rooms are vacant. Originally, missiles were fired using an analog boards (mechanical) system. When operations changed to a digital system in c1978, support moved from the central instrument control room to the north addition off of this room. Nearly all of the original interior finishes remain unchanged.

Suggested routine maintenance: Scrape, prime, and paint all block and concrete surfaces. Remove vegetation and rusted pipes by gas meter. Fill depressions at foundation, and regrade using gravel to promote positive drainage. Fill holes at concrete stoops. Replace wood bumper at dock using similar-sized lumber. Secure panel covers on abandoned electrical panels. Enclose live connections in junction boxes. Scrape, prime, and paint metal stairs. Reattach stair nose treads. Remove miscellaneous debris from building perimeter.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Still situated at the northeast corner of the intersection of Tula Peak Road, and Douglas Road.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The original floor plan remains intact.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Continues to be situated at the intersection of two roads in an isolated setting with few nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Most all original materials have been retained at both the exterior and the interior.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: All original exterior and interior room finishes remain visible. At the south elevation, one window is blocked, one window has been replaced with a door, and the door at the loading dock has been replaced. Most of the north elevation is obscured by the addition of an operations room.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1102 continues to support limited mission control operations.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

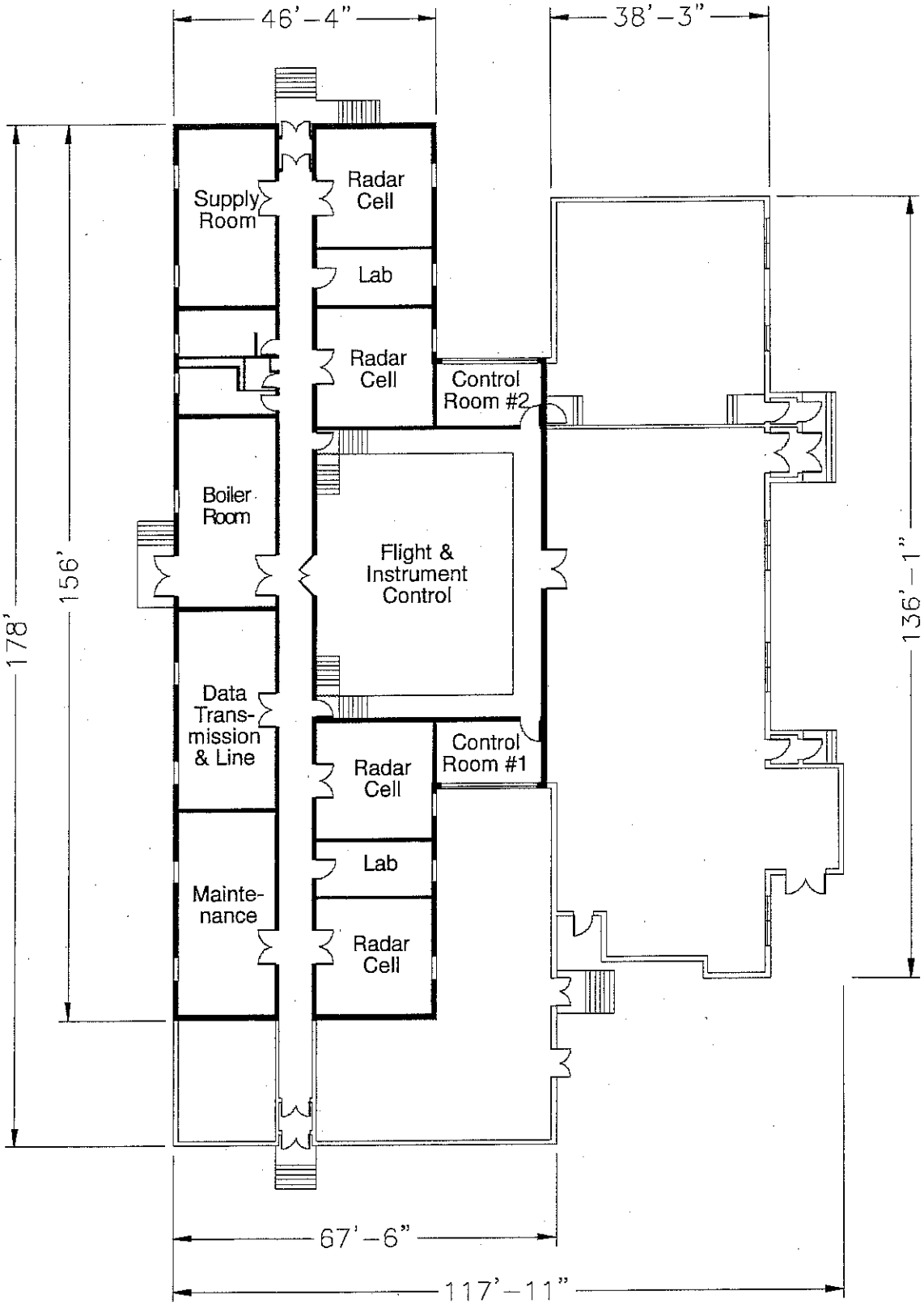
Comments: Building 1102 retains an evident link with its aesthetic and functional historic character.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #49**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1102-1 (c1952)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1102** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-6401* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1103

Specifications and History: See "Cold War Survey" the Layout Plan (Attachment 38) has also been provided.

Attachment 55c shows where the leach field was located for this building in 1984.

Facilities: This building contains the following facilities.

- Tiolets-2
- Urinals-2
- Lavatories-3
- Service Sinks-3

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Timing.
Historic: Telemetering Building.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1103

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance only.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

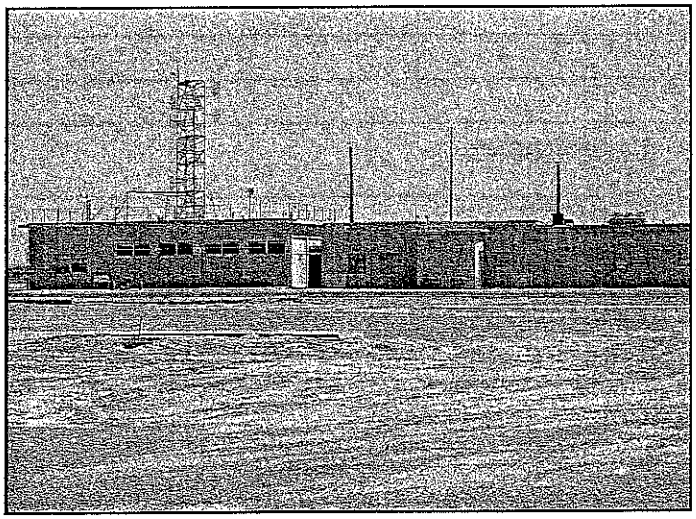
Comments: Few alterations since early improvements.

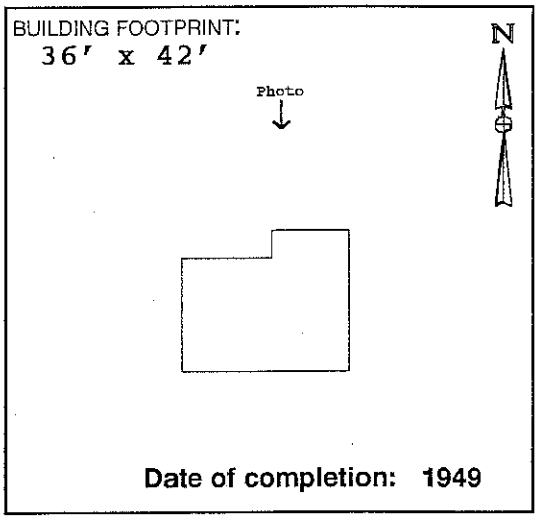
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Research recommended to determine historic use. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1103 is a one-story rectangular building with concrete masonry unit walls, and a flat roof. The original building was completed in 1949, according to "As-built" drawings located in CE File #1103-1. This original construction is centrally located, flanked to the east and west by subsequent additions. Real Property Accountable Record/1103 documents the addition of 2,930 square feet to the original building with the notation "Subsequent Improvements thru May 57." One or both additions to the original building may therefore be considered to be subsequent improvements, rather than additions that compromise historic integrity. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE: (Personal communication with Building 1103 personnel)

Current Function: (East end) Leased by WSMR to transmit mission timings.

Current Function: (West end) Unknown.

Original Function: Telemetering station for data collection of Range missions.

Interim Functions: Real Property Accountable Record/1103: "Communications CTR" (c1962); "Telecom Cen" (c1971); "Comm Fclty" (c1980); "Elec Rsch Rdr" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1103-2 (1967); CE File #1103-1 (1949).

Foundation: Concrete wall footing.

Exterior walls: Painted concrete masonry units (CMU).

Roof: Built-up roof on wood sheathing and 2 x 8 wood joists.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Although perhaps not meeting the "exceptional importance" stipulation imposed on buildings constructed within the last fifty years, Building 1103 may be eligbile for the National Register under Criterion A at a regional or national level in the year 1999. If further research determines that Building 1103 is not eligible as an individual property, consideration should be given to its eligibility as a contributing feature in a Cold War Multiple Property submission for its support of early Cold War-era test launches.

VII. ASSOCIATED BUILDINGS:

Building 1103 was associated during its historic period of significance with Building 1102, mobile data collection vans, and Building 300 at White Sands Missile Range.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1103 appears very different today from depictions on "As-built" drawings dated 1949. It is unclear whether additions to the east and west ends of the original building represent early improvements to the original building, or whether these additions represent later construction that has compromised the historic integrity of the original building. Information obtained from Real Property Record/1103 and field visits seems to indicate that the additions represent early improvements to the original building. If so, Building 1103 retains historic integrity. Further research is needed to verify the construction sequence, and to verify what early Cold War-era research activities were supported by Building 1103. Currently, Building 1103 is leased by the White Sands Missile Range. Aside from minor partitioning at the telemetering room, the original floor plan of the original building shows no alterations. Wood posts (6 x 6) that appear on original drawings to support the roof girders have been removed.

Suggested routine maintenance: Repair, or replace in kind, the exterior wood architectural features, including the soffit, fascia, wood doors, and louvers. Patch spalling concrete at foundation. Remove vegetation at roof.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Original telemetering room is now used as spare equipment storage.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Earlier location plans indicate three utility buildings situated in a row next to Building 1103 to the east. These buildings have been removed. Continues to be set in a somewhat isolated setting, in the vicinity of King-I.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Unable to access some rooms. Those rooms that were accessed, however, appear to have most of the original materials intact. A brick chimney and a metal stack have been removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original windows at north elevation have been covered up at the interior. The telemetering room has been partitioned (reversible).

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity

Comments: Building 1103 personnel are actively engaged in serving as a timing link for White Sands Missile Range tests.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

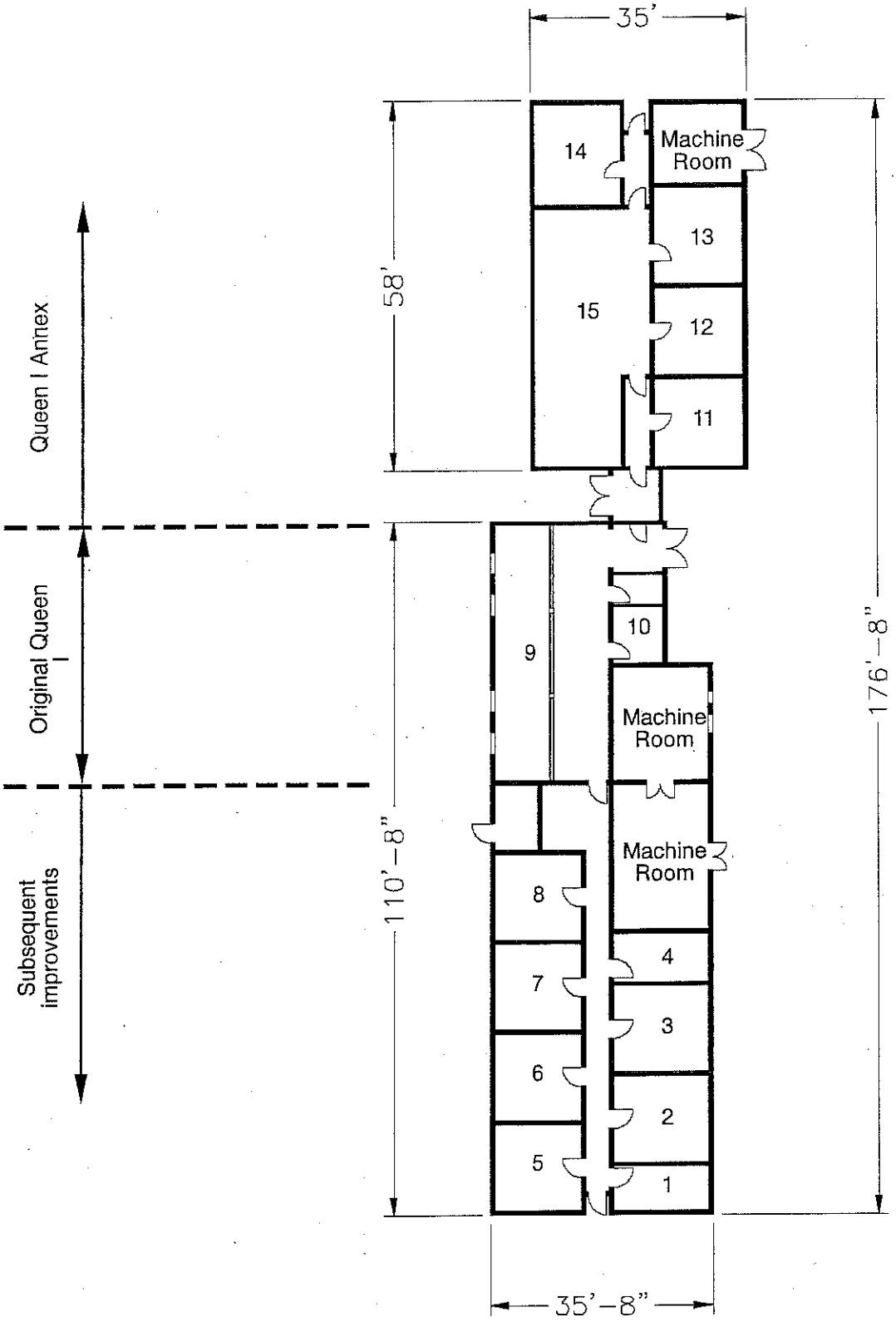
Comments: Building 1103 continues to provide support to the White Sands Missile Range.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #47**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: Dynalectron *Facilities Handbook*, c1964.

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1103** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1108

This building was constructed in 1958 and contains 2626 SF of floor space.
The building was originally built to serve as the telephone exchange. In 1980 it was retitled as a communications facility.
The building contains the following facilities:

- Toilet
- Lavatory
- Janitorial Sink

The drawings provided (Attachment 39-40) show a Utility Plot Plan, Septic Tank Details, Sewer Clean Out, Toilet Room Details and Plan Details.

Attachment 55e shows where the leach field was located for this building in 1984.

Site Specific Contingency Plan: See Attachment 1 and 2

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate into local area on ground

Tank location: North of facility

Fuel Flow - North

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST
MOGAS	250 gal each/ 2 /AST

REMOVED SEPTIC SYSTEMS

BUILDING 1119

This is an Army owned building that contains 2224 SF of floor space. Use and maintenance of the building was transferred to the Air Force in 2005. Prior to the Air Force taking possession the Army had delegated the building to the GSA for use as a vehicle maintenance shop. Once the Air Force took over, the building changed service to an electrical shop and storage facility.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
Diesel	250 gal ea/ 3 /AST
MOGAS	250 gal ea/ 2 /AST
Diesel	750 gal ea/ 3 /AST

Figure 9: Picture of Bldg 1119

REMOVED SEPTIC SYSTEMS

BUILDING 1150

This is also an Army owned building and therefore details are lacking from Holloman's records. The building has 2844 SF.
The original service is unknown, but since the Air Force started using the building it has been used as storage space.
It contains the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 9: Drawing of Bldg 1150

REMOVED SEPTIC SYSTEMS

BUILDING 1154

This is an Army owned building and there is no information in Holloman's files pertaining to this building.

Attachment 55c shows where the leach field was located for this building in 1984.

REMOVED SEPTIC SYSTEMS

BUILDING 1166

This building was constructed in 1960 and contains 4955 SF. The structure is a Test Track Shop/Storage Building known as the "Break Setter Building".
The facilities include:

- Toilets-2
- Urinal
- Lavatory
- Shower

Attachment 41 is a drawing showing the sewer layout and the septic tank details.

Attachment 55c shows where the leach field was located for this building in 1984.

Site Specific Contingency Action: See Attachment 3

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate in local area on ground; if full tank or drum spilled' the substance may reach open ditch.

Material Compatibility: No material incompatibilities

Chemical	Container Type
Oil/Water Separator Waste	500 gal/ 1 / UST

Figure 10: Picture of Bldg. 1166

REMOVED SEPTIC SYSTEMS

BUILDING 1175

Specifications and History: See "Cold War Survey"
Facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

In Attachments 42-44 a trench pit, the toilet room details, the trench junction to UPS, the sanitary sewer manhole and water and sewer piping can be found for Bldg 1175.

Attachment 55c shows where the leach field was located for this building in 1984.

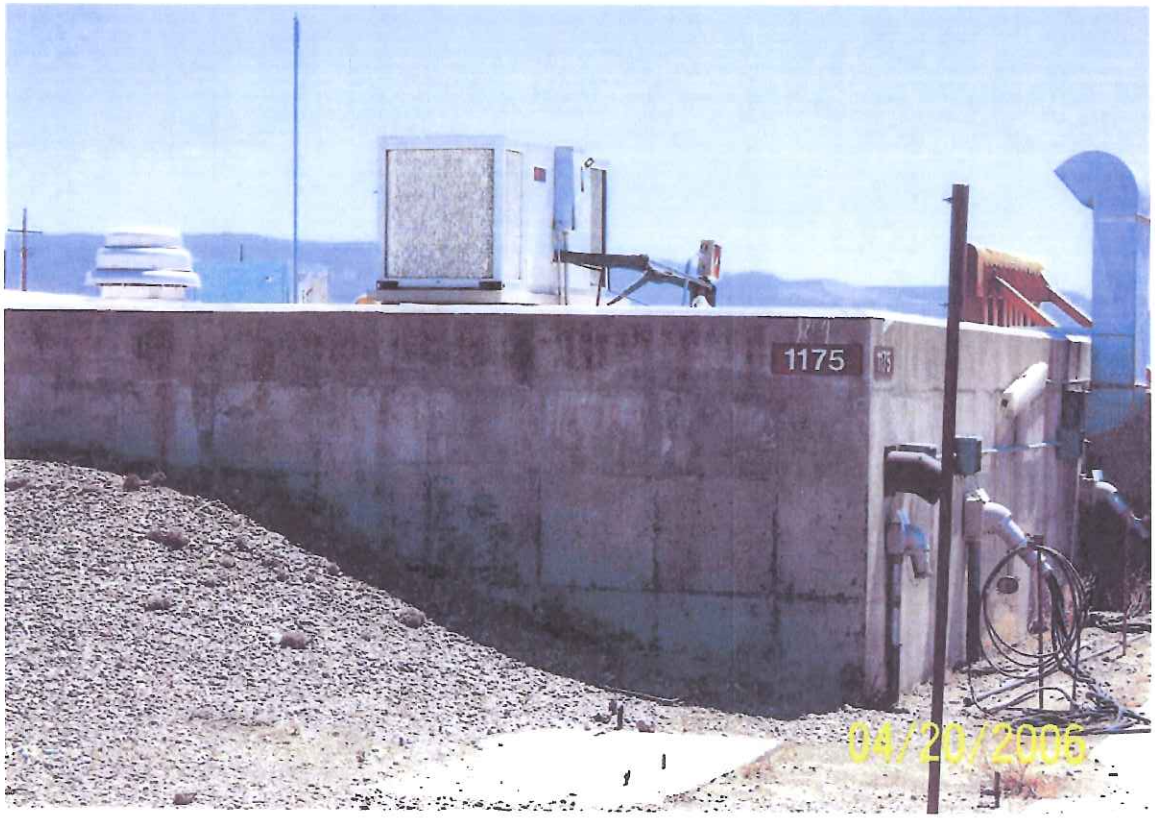


Figure 11: Picture of Bldg 1175

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Blockhouse--"Alpha".
Historic: Blockhouse--"Alpha".
Street Address: 1656 Test Track Rd., HAFB, 88330-7848.

Building Number: 1175

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1175 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

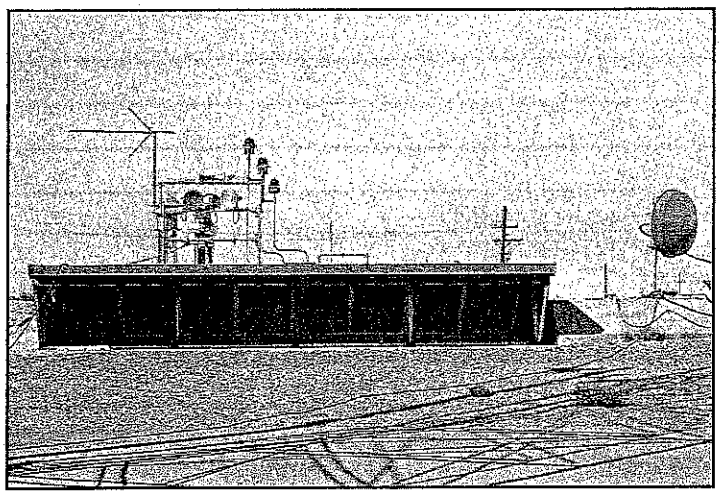
Comments: Modernization at interior to enable continued Test Track use.

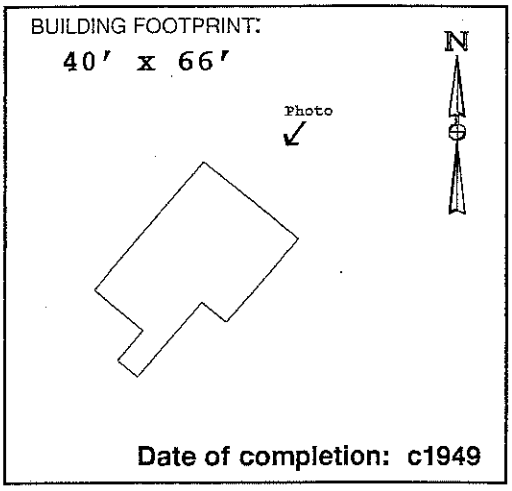
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible for the National Register under Criteria A and/or C.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1175 is an irregularly shaped, one-story concrete structure, built mostly below grade. The building is accessed by a ramp leading down to double doors at the southwest elevation. These doors access the original launch control room constructed in c1949. This entrance, three entrances off of the ramp, and windows facing the track (northeast) are the only visible openings. A 15′ x 32′-6″ addition was constructed at the northwest elevation in 1960 (CE File #1175-2). Another addition, adjacent to northwest side of ramp was completed in 1981 (CE File #1175-3). The ramp extension was also constructed at this time. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1175; CE File #1175-1 (c1949).

Current Function: Launch control facility, High Speed Test Track.

Original Function: Launch control facility, High Speed Test Track.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1175-1 (c1949); CE File #1175 (c1980).

Foundation: Concrete footings.

Exterior walls: Reinforced concrete.

Roof: 3-foot thick reinforced concrete.

Notable interior features, including machinery:
A long row of thick blast-proof windows faces the track to the northeast.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

366

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

"Alpha" Block house Building 1175 is one of the original High Speed Test Track support facilities, constructed c1949 to provide launch control. Recommend that Building 1175 be nominated under Criteria A and C as part of a basewide early Cold War Multiple Property listing.

VII. ASSOCIATED BUILDINGS:

Building 1175 operated, and continues to operate, in support of the high speed test track launching activities, along with Buildings 1162, 1163, 1161, 1645, and the Horizontal Test Stand facility (Buildings 1159 and 1160).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1175 retains historic integrity. Due to its national level of significance under Criteria A and C, recommend that Building 1175 be listed along with the other test track support buildings as part of a Multiple Property nomination to the National Register of Historic Places.

Subsequent improvements to the original Building 1175 augmented the original design and function as a launch control facility for important research conducted at the high speed test track. The interior was renovated in 1984 (CE File #1175-4). Although this renovation obscures original interior finishes, Building 1175 as a whole retains historic integrity of location, design, setting, workmanship, materials, feeling, and association. Of interest to future researchers may be the dramatic changes in computer technology which have occurred since the construction of Alpha Blockhouse: Computers which at that time required several rooms to house, now occupy considerably less space. Launch control operations continue at Alpha Blockhouse, although rooms designed to hold early equipment are virtually empty.

Suggested routine maintenance: Repair bond beam where steel is exposed. Remove vegetation at exterior embankments. Remove debris at front walkway.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Subsequent improvements to the original floor plan added to Building 1175's design and function as a launch control facility.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Except for the construction of smaller buildings in the vicinity, the original setting of Building 1175 near the test track launch pad has been retained.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: The raised wood floor in the console room has been removed. The original light fixtures have been removed. One wood and glass partition has been removed. Sheetrock® walls, carpeting, wainscot, and linoleum have been added to the control room.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original workmanship at the northeast elevation, and at the entrances at the ramp is still visible. Interior renovations hide the original architectural craftsmanship.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1175 continues to function as a launch control facility for the High Speed Test Track.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

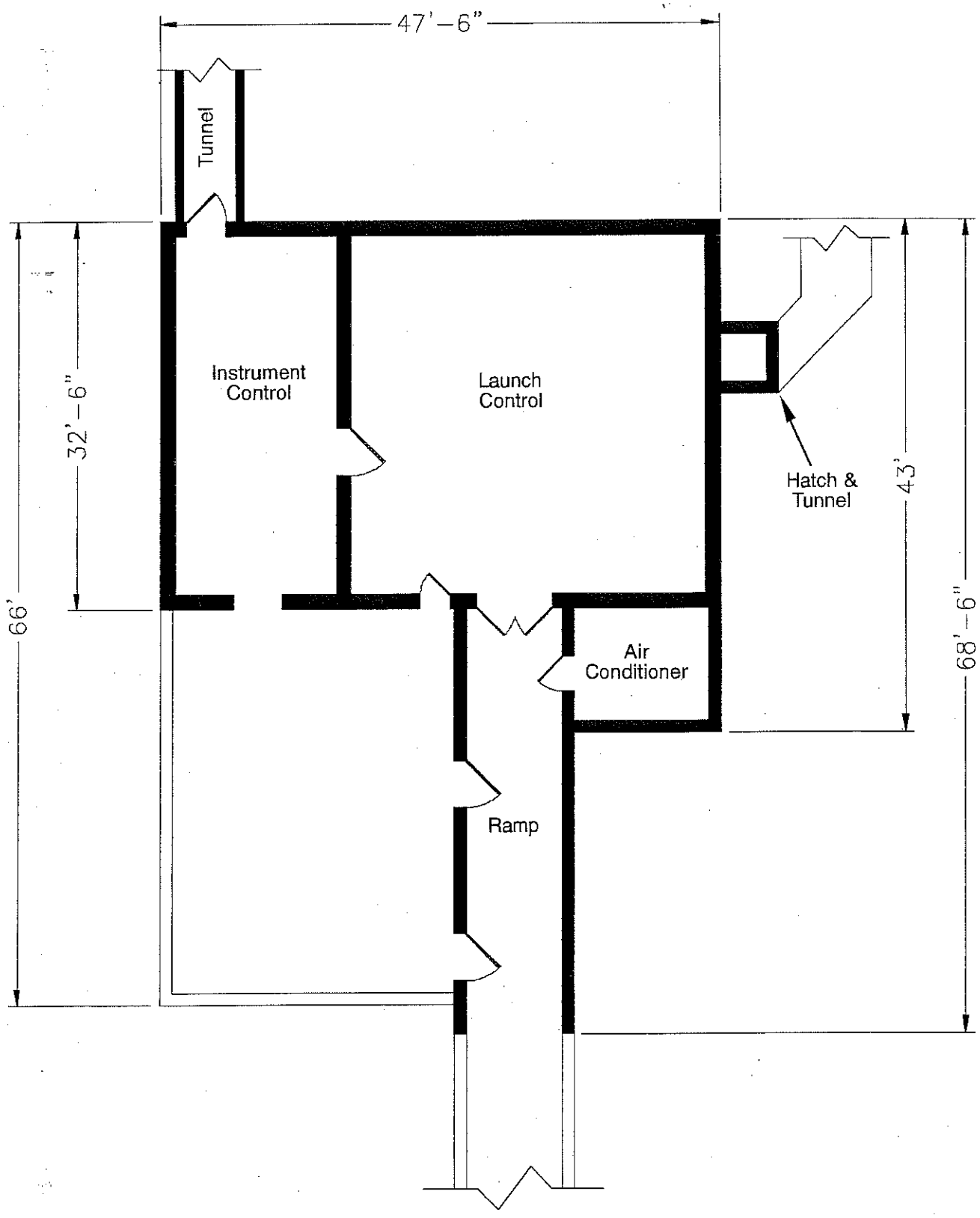
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #35**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1175 (c1980)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1175** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1176

This building was constructed in 1959 and contains 3850 SF.
The building is located at the Test Track and is known as the Sled Launch Shop.
Facilities include:

- Toilet
- Lavatory
- Shower

In Attachments 45-48 a plumbing plan, new drain pit, utility plan, sewer clean out, utilities contour plan and septic tank details can be found for Bldg 1176.

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 12: Picture of Bldg 1176

REMOVED SEPTIC SYSTEMS

BUILDING 1173

This building was constructed in 1957 and contains 17,428 SF.
The building is the main office building at the Test Track.
It contains the following facilities:

- Toilets-8
- Urinals-4
- Lavatories-9
- Janitorial Sinks-2

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 13: Picture of Bldg 1173

REMOVED SEPTIC SYSTEMS

BUILDING 1265

This building was constructed in 1957 and covers 43,388 SF.
This is the Inertial Guidance Facility, previously known as the Guided Weapons Lab.
The building contains the following facilities:

- Toilets-12
- Urinals-6
- Lavatories-12
- Janitorial Sinks-5

This building has been attached to the sewer system at Holloman AFB since before 1984.

In Attachments 49-53 a Water Piping Diagram, Partial Plumbing Plan, Floor Plan, Building, Pavement and Utilities Layout, Sewer Clean Out, and Enlarged Plan can be found for Bldg 1265.

North Wind

Letter No. NW-2008-155

Mr. Dave Griffin
Project Manager
49 CES/CEV
550 Tabosa Ave.
Holloman AFB, NM 88330-8458

11 March 2008

SUBJECT: Technical Memorandum summarizing the decommissioning of inactive septic tanks at HAFB in January of 2008

Dear Mr. Griffin:

Reference Contract Number: W9128F-04-D-0017 DO-0017

Attached please find a copy of the above referenced Technical Memorandum and attached State of New Mexico On-Site Liquid Waste System Abandonment forms. Also attached are copies of the daily reports for the field work.

Please contact me (phone 785-838-3141 or email at tmatzen@northwind-inc.com) or the Program Manager, Rusty Gilbert (phone 210-722-4074 or email at rgilbert@northwind-inc.com) if you have any questions.

Sincerely,

Thomas A. Matzen, P.G.
Project Manager
North Wind, Inc.

Attachments: Technical Memorandum summarizing decommissioning work conducted on inactive septic tanks at HAFB

cc: R. Gilbert (North Wind)
Mr. Tom Zink (USACE Omaha District)
Letter File

North Wind

Technical Memorandum

11 March 2008

To: Mr. David Griffin, Holloman AFB
CC: Mr. Tom Zink, USACE Omaha

From: Tom Matzen, North Wind, Inc

SUBJECT: Decommissioning of Abandoned Septic Tanks Conducted 8 - 24 January 2008 at Holloman AFB

Purpose

This memorandum summarizes the septic tank decommissioning activities conducted on abandoned STLFs from 8 through 24 January 2008 at Holloman AFB.

Description of Work

North Wind, Inc. (NWI) contracted a local septic system installer (Jontel Septic) to decommission 21 abandoned Septic Tanks at Holloman AFB. During the course of the decommission work NWI was requested also to abandon a septic tank at Building 1284 for a total of 22 tanks. North Wind provided a field supervisor to obtain excavation permits, coordinate field activities, and to ensure that quality and safety requirements were met.

Base dig permits were obtained for each of the systems prior to conducting any excavation work necessary to locate the systems. After dig permits were obtained, each system was excavated (if required) to the extent necessary to remove the top of each tank, crush or otherwise perforate the bottom of each tank such that water will not pool in the abandoned tank, and backfill each tank with clean fill per State of New Mexico requirements. Each system was pumped out (if it contained any liquid or sludge), and visually inspected prior to decommissioning.

The required system abandonment forms for each septic tank with accompanying photographs are in Attachment 1. Attachment 2 contains the Daily Progress Report/Quality Control Report Forms. Please note that these forms start at number 29. Forms 1 through 28 were used for daily reporting on the Septic Tank and Leach Field Inspection work.

Interpretation of Findings:

Several tanks were still active and so were not decommissioned. These include the tanks at Buildings 308 (actually an oil/water separator), 1097, 1219, 1226, 1235, and 1239. No septic tanks could be located at Buildings 1200, 1201, and 1269 though we did backfill an earthen pit at Building 1200 and an abandoned sewage treatment plant at Building 1201. Mr. Shawn Quarles, the Base safety person, marked Building 1190 off of the 332 form. Mr. Quarles stated that Building 1190 had been demolished and that there was nothing left at that location. The location of the septic tank at Building 1284 was such that it could not be accessed for demolition. The septic tank at Building 1091 was not abandoned at this time as NWI was unable to obtain a security escort. The tank at Building 1091 will be abandoned while NWI is working on the active septic tank upgrades.

As the abandonment forms indicate, the majority of the septic systems on the original list provided by HAFB were decommissioned per state requirements.

Table 1 summarizes the decommissioning activities and status of the listed septic systems.

Summary of Results

Table 1. Summary of septic system decommissioning activities for abandoned STLFs at HAFB.

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
1	308	01/24/08	Found an oil/water separator still in use.	Notified Base POC that this is an oil/water separator.
2	920	01/16/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
3	921	01/16/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
4	922	01/17/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
5	924	01/17/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
6	1091	01/24/08	Building is in security area. Could not obtain escort.	No action taken at this time. Will decommission tank when we are in the area doing tank replacement work.
7	1097	01/23/08	Found that the septic tank for this building is also hooked into Bldg 1099 and is still in use. Inspected system. This septic tank has no manholes, bottom is damaged and is leaking, no baffle present, leach field is dry and full of dirt.	Turned system back over to active list and inspected system. Inspection form is attached.
8	1190	01/14/08	During the course of obtaining a dig permit for this Bldg the safety person, Mr. Shawn Quarles, marked this one off of the 332 form. Mr. Quarles stated that this Bldg had been demolished and that nothing was left at that location.	Notified Base POC of situation regarding Bldg 1190

North Wind

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
9	1194	01/09/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
10	1196	01/08/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
11	1199	01/09/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
12	1200	01/11/08	No septic tank located. Did locate abandoned earthen pit with a concrete cover. Notified Base POC of situation and received instructions to backfill and abandon.	Removed concrete cover over pit and backfilled pit with clean fill.
13	1201	01/11/08	No septic tank located. Did locate an old abandoned treatment plant. Notified Base POC of situation and received instructions to decommission and backfill the old treatment plant.	Demolished old treatment plant by crushing bottom and caving in sides, then backfilled with clean soil.
14	1219	01/18/08	Septic tank still in use	Notified Base POC that system is still in use
15	1221	01/18/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
16	1226	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.
17	1235	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.
18	1239	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.

North Wind

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
19	1250	01/23/08	Located abandoned septic tank. Also found an old diesel tank still containing fuel.	Opened septic tank, pumped out, crushed bottom, and backfilled tank. Notified Mr. Gomolak at CE Environmental regarding diesel UST.
20	1251	01/23/08	Located abandoned septic tank	Opened tank, pumped out, crushed bottom, and backfilled tank.
21	1269	01/16/08	Could not locate any septic tank. Mr. Vernon (a 30+ year employee) stated that the building had been on the base sewer system for the last 30 years and that the septic tank may have been removed when the moat around the building was removed.	Notified Base POC that there does not seem to be a septic tank at this building.
22	1284 (not on original list, added at request of HAFB POC)	01/16/08	Septic tank hangs over back side of area and is not accessible for removal. This tank is a holding tank with a manual valve that drains to a ditch below. There is no water in the associated Bldg.	Notified Base POC. No action taken.

Future Work

As discussed above in Table 1 the septic tank at building 1091 still must be decommissioned. There are septic systems in that area that require repair and 1091 will be decommissioned when the other septic tanks are being repaired.

North Wind

Attachment 1
Septic Tank Abandonment Forms

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
ON-SITE LIQUID WASTE SYSTEM ABANDONMENT

NMED Permit No.: N/A

System Owner's Name: USACE

Address: HAFB Building # 1199

BUILDING SEWER:

_____ Connected to Sewer Lines or Plugged/Capped based on UPC Requirements

ON-SITE LIQUID WASTE SYSTEM TYPE:

- [✓] Septic Tank
- [ ] Seepage Pit
- [ ] Sec./Tert. Treatment Unit
- [ ] Other:
- [ ] Holding Tank
- [ ] Cesspool

ABANDONMENT PROCEDURE:

- ✓ System Pumped
- ✓ Bottom of System Opened or Ruptured or Unit Collapsed
- ✓ System filled with Earth, Sand, Gravel, Concrete, or Other Approved Material
- ✓ Top Cover Removed or Collapsed
- ✓ System Filled to the Top of Sidewalls or above the Level of any Outlet Pipe
- ✓ System Filled Level with Top of Ground Surface

COMMENTS/VIOLATIONS:

Elevation 4133 GPS: N32.87671° W-106.10142°

ABANDONMENT PERFORMED BY:

Company Name: Ortiz Septic Co.

Address: PO Box 927, Zuzax NM 88337

NMED ACTION TAKEN:

- [ ] Abandonment Approved
- [ ] Abandonment Approved w/conditions (See Comments/Violations)
- [ ] Abandonment Not Approved (See Comments/Violations)

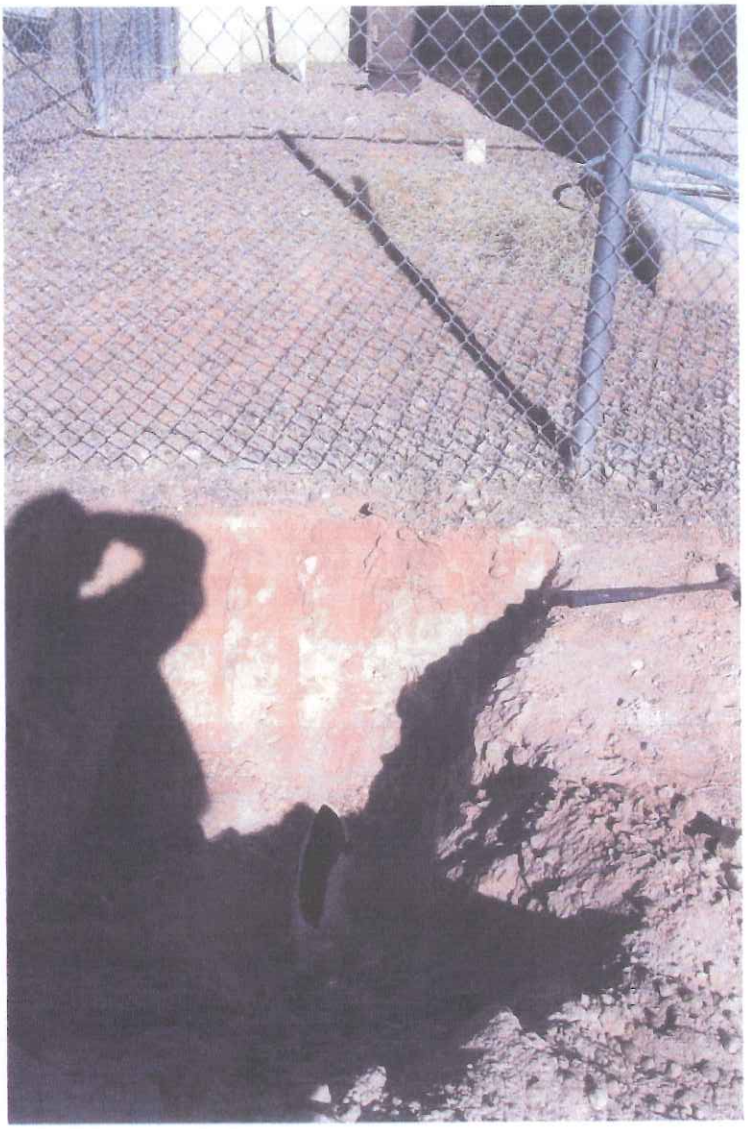
FINAL APPROVAL:

- [ ] Granted
- [ ] Not Granted

_____
NMED Inspector Date

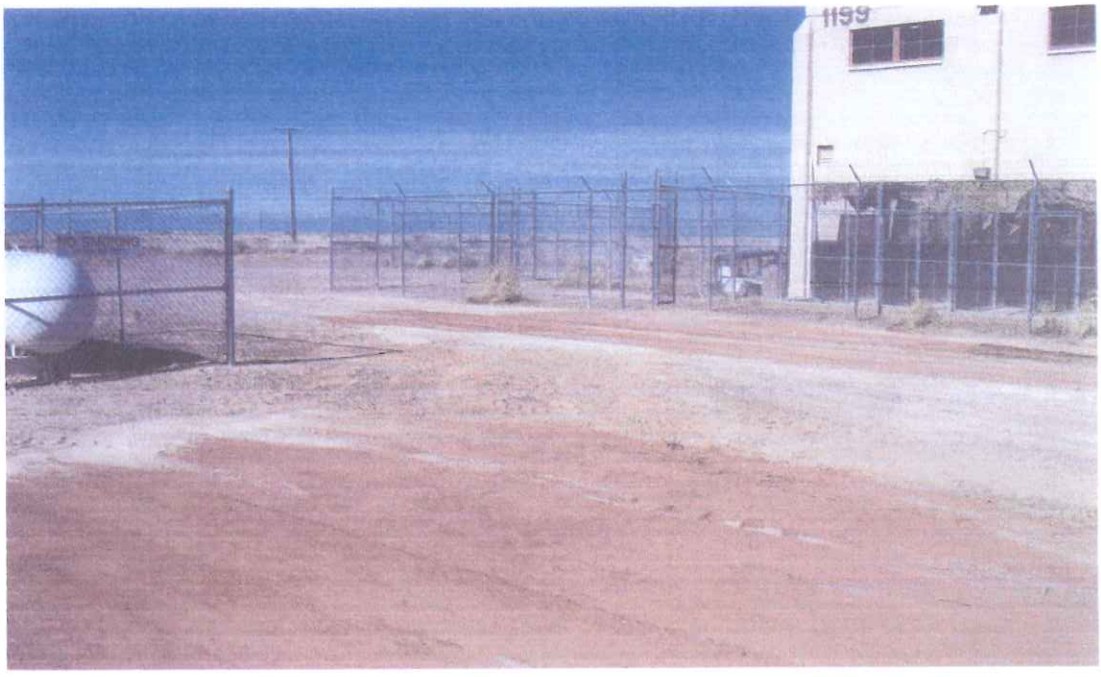
OK - If Abandoned and meets Requirements	N/C - Not Compliant
N/I - Not Inspected	N/V - Not Verified
N/A - Not Applicable	

1199



1199

96/11



Appendix B
Photographic Log

Appendix B
Photographic Log
Building 1199 (OT-C536)

Photo No.	Task and Description
1	Former Septic Tank Location Building 1199
2	Leach Field Location Building 1199
3	Geoprobe® Building 1199
4	Geoprobe® Building 1199
5	Monitoring Well Installation Building 1199
6	Groundwater Sampling Building 1199

PHOTO 1: Former Septic Tank Location Building 1199

PHOTO 2: Leach Field Location Building 1199

PHOTO 3: Geoprobe® Building 1199

PHOTO 4: Geoprobe® Building 1199

PHOTO 5: Monitoring Well Installation Building 1199

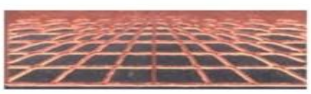
PHOTO 6: Groundwater Sampling Building 1199

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-073

Appendix C
Geophysical Report

ULS SERVICES CORPORATION

GEOMARKOUT LOCATING Co a tradename



SAN DIEGO–LA . SF- SAC . SEATTLE . ALASKA . HAWAII- GUAM

1 (800) 528 – 8206 www.geomarkout.com 1 (866) 804 – 5734

---------- *A Veteran Owned Small Business* ----------

5 July 2012

Christopher Long, P.G.
Scientist
Federal Services
Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, TX 77077

Subject: Field Documentation Report for Geophysical Services -
Location of Utilities and Underground Features Associated
With Former UST and Septic System Sites,
Holloman AFB, NEW MEXICO (SHAW PO 783916-000 OP)

Gentlemen:

This report documents the recent Geophysical Survey field work ULS Services Corp completed at the subject site On and between the dates of 11 June 2012 thru 23 June 2012.

SHAW / ULS SERVICES CORP
GEOPHYSCIAL SERVICES
FORMER UST AND SEPTIC SYSTEM SITES
5 JULY 2012

SCOPE OF WORK

Scope of this work is includes geophysical services at approximately 29 Former UST or Septic Systems sites located across Holloman AFB that have reportedly undergone past abandonment in place or excavation activities. Geophysical services are employed in an attempt to locate potential USTs, former UST excavation areas, abandoned septic tanks or excavations and associated leach field areas. Location of underground utilities near these observed features is included. Observations are marked out in field and electronically mapped with GPS data collection and GIS presentation. Survey of each site is approximately 25 by 25 to 100 by 100 feet in size.

METHODS

Methods utilized in performance of this work include: Visual Inspection, Analog Real - Time Electromagnetic Induction Conductivity Detection (EMICD), Magnetic Locating (MGL), Ground Penetrating Radar (GPR), and EM Pipe and Cable Location (EMPCL). A sub-meter WAAS GPS receiver with automatic real -time differential correction and ESRI Arcpad software is utilized to collect observation data. ESRI Arc View 10 GIS software is utilized for mapping presentation.

EMIMD ground induction methods are employed to detect both 1) broad metal mass anomalies (Rectangular Surface Projections) or conductive zones that may be indicative of potential USTs – Septic tanks, conductive metal debris, steel reinforced concrete, UST's, building hosts, piping, building demo materials, drums, sumps or other unknown burial materials; and 2) to detect relative lateral changes in conductive zones of soil or backfill materials relative to native soils. Former UST excavations and septic -leachate material may potentially have a higher conductive response or well drained leachate fill materials associated with septic systems may in some cases exhibit a relatively lower or quiet conductive response relative to surrounding higher conductive soil response. A two-way Cartesian grid pattern of five by five feet is walked within the search area (site). Observations are real time and marked on ground surface with paint and pin flagging. Observations are collected with a sub- meter GPS with automatic differential correction and plotted approximately onto web based imagery.

GPR is utilized to detect and potentially observe former UST excavation sidewalls as well as septic – leach field pit sidewall and fill areas. GPR is also utilized to compliment the EM Pipe and Cable utility survey work by potentially locating conductive as well as non-conductive utilities.

A EM Pipe and Cable Survey is conducted at each site by performing ambient passive live power and communication line sweeps, active ground induction sweeps, and active direct- connect or induction- clamp sweeps using existing conducts or pipes visibly nearby. Multiple active frequencies are utilized for best Detection. Utilities are identified where possible and marked unknown if not identified.

All observations are marked with hi-visibility orange-red marking paint. Some Ares are hi-lighted with black paint due to light soil conditions. GPR boundaries indicating potential septic tank and leach field areas are outlined with black paint. Pin flags are also utilized to mark these boundaries in soft soil and weed areas.

OBSERVATIONS

Site Description

The Project Site (Holloman AFB - Former UST and Septic Systems) is comprised of approximately 29 different environmental site locations (heir in referred to as Sites) . Each sites includes and varies in description from existing active building locations to in-active remote abandoned to former building areas where USTs or Septic systems were utilized in the past. Each Site is fairly flat with sandy to gravelly surface conditions. Some sites include native brush and weeds. Sites near active building areas include asphalt or concrete surfaces, sidewalks and planter areas. ULS field staff helped review historical documentation available of each site in the field. Where available, drawings and photographs were reviewed. When available, reported GPS coordinates from reports, of septic tank locations, were utilized by SHAW field staff to navigate to septic tank location to aid focus search area.

Generally there are no surface indications of USTS or Septic tanks, however some limited features exist at some sites and include potential vent riser pipes and asphalt patching, settling areas, and conidial – rectangular cracks in concrete. Surface indications of septic systems at some sites include potential inactive clean- outs pipes near building and nearby existing upgraded sewer man-hole systems that have been connected to the existing Base sewer collection system. Some septic system sites have open holes , surface erosion, and associated potential underground voids observed near the inactive cleanouts and suspected septic search area.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

General ambient or background EM conditions at this site are categorized as being high or noisy most likely resulting from caliche or saline soil conditions throughout the area. These conditions all result in a high ambient background EMICD response that are difficult to filter out, however, subtle to distinct lateral changes are observed potentially marking position of former UST excavations. Magnetic locator is not affected by saline conditions. GPR response in these conditions is poor to somewhat fair, however, subtle, trends in GPR observations exhibit dipping or high angle (from horizontal) refraction bands indicating potential soil side-wall trends allowing for location of approximate former excavations. The use of EMICD and GPR data in conjunction with historical information and physical observations are all utilized to mark the approximate location of potential former USTs in the field as shown on the GIS imagery maps.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

Similar response is observed near former septic systems. Most all septic tanks are reported to have been abandoned in place or partly crushed in place. Magnetic locator surveys revealed concentrated areas of metal response (metal anomalies) likely from metal plates and rebar in septic tanks in areas near former sewer clean-outs and next to reported septic tank locations where latitude and longitude data is available. EM Induction and GPR transects over these metal anomalies further corroborated these findings. EM Induction survey results near the effluent (down gradient) side of metal anomalies (potential septic tanks) resulted in observation of relatively moderately higher lateral response to zones of low to quiet lateral response zones near the septic tanks relative to the ambient response in surrounding area. GPR data across these zones exhibited very subtle side-wall trends that appear to corroborate with EMICD findings. The use of EMICD and GPR data in conjunction with historical information and physical observations of cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs in the field and as shown on the GIS imagery maps.

CONCLUSIONS and LIMITATIONS

The use of EMICD and GPR data in conjunction with historical information and physical observations of reported building location, vent riser location, boiler room location, existing and abandoned sewer cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs , Septic tanks and leach fields. Ambient soil conductivity at this site is very high and EM and GPR data observed is very subtle. Field trends are used to mark the approximate location of potential targets.

As in any type of survey or investigation to determine characteristics below grade, careful exploratory excavation or drilling may be needed to further help determine a more accurate determination of the subsurface. Use of hand tools and air knifing is also useful to help as a safety measure. Base one- call utilities, as well as, private 811 one –call should be consulted and recalled as necessary.

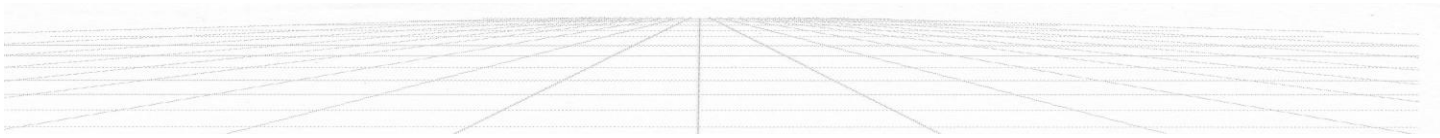
If you have any questions regarding this report please contact me at (206) 384- 2857.

Sincerely,

ULS SERVICES CORPORATION
Geomarkout tradename

Michael W. Benedict
Site Representative

Admin Office/Billing: PO Box 724 Pocatello, Idaho 83204
(208) 234-1441 Fax (208) 234-1507 1 800 301-4420
Seattle / Portland / SAC / Alaska / HWI – AS - GUAM Operations
1 - (866) 804- 5734 / San Diego – LA / Operations 1 - (800) 528-8206



BLDG 1199 SETIC SYSTEM
HOLLOMAN AFB

WGS_1984_UTM_Zone_13N
ULS SERVICES CORP
mwb 14 June 2012

0 12.5 25 50 75 100
Feet

Appendix D
Sample Collection Logs

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code **OTC536**

RFA / COC Number 149106-H002

Sample Number **OTC536-IS-0001-MMDDYY**

Task

Sample Name **OTC536-z-OTC536-IS-0001-MMDDYY-z**

Collection Date 6/21/12

Sampling Method **Unknown**

Sample Type **Unknown**

Collection Time 1445

Start Depth 3'

Sample Purpose **Unknown**

End Depth 5'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sampling Equip

Sample Matrix **SOIL**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

6/21/12

Logged By / Dat Rachel Daly *Reviewed By / Dat*

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager Christopher Long

Location Code OTC536 *RFA / COC Number* 144106-H002

Sample Number OTC536-IS-0002-MMDDYY *Task*

Sample Name OTC536-z-OTC536-IS-0002-MMDDYY-z *Collection Date* 6/21/12

Sampling Method Unknown *Sample Type* Unknown *Collection Time* 1455

Sample Purpose Unknown *Start Depth* 10'

QC Code NORMAL ENVIRONMENTAL SAMPL *End Depth* 12'

Sampling Equip _____ *Sample Matrix* SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: _____

Sketch Location:

Logged By / Dat: Rachel Daly 6/26/12 Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager Christopher Long

RFA / COC Number 144106 - ~~H002~~ H003 RCD

Location Code OTC536

Task

Sample Number OTC536-IS-0003-~~MMDDYY~~ 062212

Collection Date 06-22-12

Sample Name OTC536-z-OTC536-IS-0003-MMDDYY-z

Collection Time 0750

Sampling Method Unknown

Sample Type Unknown

Start Depth 7'

Sample Purpose Unknown

End Depth 9'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sample Matrix SOIL

Sampling Equip

QC Partners:
(TB) (EB) (FB)

SampleTeam RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: See OTC536-IS-0003-062212, That sample was collected at incorrect depth, and will not be analyzed by lab. This is the resample.

Sketch Location:

Rachel Daly 06/22/12

Logged By / Dat

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager Christopher Long

Recollected on 062212 @ 5'-9'

Location Code OTC536

RFA / COC Number 144106-H002

Sample Number OTC536-IS-0003-~~MMDDYY~~ 062112

Task

Sample Name OTC536-z-OTC536-IS-0003-MMDDYY-z

Collection Date 062112

Collection Time 1505

Sampling Method Unknown

Sample Type Unknown

Start Depth 3'

Sample Purpose Unknown

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sample Matrix SOIL

Sampling Equip

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: INSTRUCTED LAB NOT TO ANALYZE

Sketch Location:

6/21/12

Rachel Daly

Logged By / Dat

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

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Manager Christopher Long

RFA / COC Number 144106-H003

Location Code FIELDQC

Task

Sample Number OTC536-IS-0004-~~MMDDYY~~-FD 062212

Collection Date 06-22-12

Sample Name FIELDQC-z-OTC536-IS-0004-MMDDYY-FD-z

Collection Time 0755

Sampling Method Unknown

Sample Type Unknown

Start Depth 7'

Sample Purpose Unknown

End Depth 9'

QC Code FIELD DUPLICATE

Sample Matrix SOIL

Sampling Equip

QC Partners:

(TB) *(EB)* *(FB)*

SampleTeam

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: see OTC536-15-0004-062112. Sample was collected at wrong depth. this is the resample.

Sketch Location:

6/22/12

Rachel Daly

Logged By / Dat

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager Christopher Long

Recollected on 062212 @ 7:19

Location Code FIELDQC

RFA / COC Number 144106-H002

Sample Number OTC536-IS-0004-~~MMDDYY~~ 062117 FD

Task

Sample Name FIELDQC-z-OTC536-IS-0004-MMDDYY-FD-z

Collection Date 6/21/12

Collection Time 1510

Sampling Method Unknown

Sample Type Unknown

Start Depth 3'

Sample Purpose Unknown

End Depth 5'

QC Code FIELD DUPLICATE

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: INSTRUCTED LAB NOT TO RESAMPLE

Sketch Location:

06/21/12
Rachel Daly

Logged By / Dat

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw a Washington Solutions

Manager Christopher Long

RFA / COC Number 149105H003

Location Code OTC536

Task

Sample Number OTC536-IS-0005-~~MMDDYY~~ 062212

Collection Date 6/22/12

Sample Name OTC536-z-OTC536-IS-0005-MMDDYY-z

Collection Time 0810

Sample Type Unknown

Sampling Method Unknown

Start Depth RSD ~~10~~ 12 14

Sample Purpose Unknown

End Depth RSD 12 16

QC Code NORMAL ENVIRONMENTAL SAMPL

Sample Matrix SOIL

Sampling Equip

QC Partners:
(TB) (EB) (FB)

SampleTeam RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

6/22/12
Rachel Daly

Logged By / Dat

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager Christopher Long

Location Code OTC536

RFA / COC Number 144106-H003

Sample Number OTC536-IS-0006-~~MMDDYY~~ 062212

Task

Sample Name OTC536-z-OTC536-IS-0006-MMDDYY-z

Collection Date 6/22/12

Collection Time 0830

Sampling Method Unknown

Sample Type Unknown

Start Depth 3'

Sample Purpose Unknown

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Rachel Daly 6/22/12

Logged By / Dat

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager Christopher Long

Location Code FIELDQC

RFA / COC Number 144106-H003

Task

Sample Number OTC536-IS-0006-~~MMDDYY~~-MS 062212

Collection Date 06/22/12

Sample Name FIELDQC-z-OTC536-IS-0006-MMDDYY-MS-z

Collection Time 0830

Sampling Method Unknown

Sample Type Unknown

Start Depth ~~3~~ 7' 3' RGD

Sample Purpose Unknown

End Depth ~~5~~ 9' 5'

QC Code LAB MATRIX SPIKE

Sample Matrix SOIL

Sampling Equip _____

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: _____

Sketch Location:

6/22/12

Rachel Daly

Logged By / Dat

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager Christopher Long

Location Code FIELDQC

RFA / COC Number 144106-H003

Task

Sample Number OTC536-IS-0006-~~MMDDYY~~-MSD 062212

Collection Date 06/22/12

Sample Name FIELDQC-z-OTC536-IS-0006-MMDDYY-MSD-z

Collection Time 0830

Sampling Method Unknown

Sample Type Unknown

Start Depth ~~3~~ 3' RPD

Sample Purpose Unknown

End Depth ~~5~~ 5'

QC Code LAB MATRIX SPIKE DUPLICATE

Sample Matrix SOIL

Sampling Equip _____

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: _____

Sketch Location:

Rachel Daly 6/22/12

Logged By / Date *Reviewed By / Date*

Sample Collection Log

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- Holloman AFB

Manager **Christopher Long**

Location Code **OTC536**

RFA / COC Number 144106-H003

Sample Number **OTC536-IS-0007-MMDDYY**

Task

Sample Name **OTC536-z-OTC536-IS-0007-MMDDYY-z**

Collection Date 06/22/12

Sampling Method **Unknown**

Sample Type **Unknown**

Collection Time 0840

Start Depth 10'

Sample Purpose **Unknown**

End Depth 12'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sampling Equip

Sample Matrix **SOIL**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Rachel Daly

Logged By / Dat

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

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Manager **Christopher Long**

Location Code **OTC536**

RFA / COC Number 144106-H003

Sample Number **OTC536-IS-0008-MMDDYY**

Task

Sample Name **OTC536-z-OTC536-IS-0008-MMDDYY-z**

Collection Date 06/22/12

Sampling Method **Unknown**

Sample Type **Unknown**

Collection Time 0855

Sample Purpose **Unknown**

Start Depth 3'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

End Depth 5'

Sampling Equip

Sample Matrix **SOIL**

QC Partners:

(TB) *(EB)* *(FB)*

SamplaTeam RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	)(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Rachel Daly 6/22/12

Logged By / Dat

Reviewed By / Dat

Sample Collection Log

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- Holloman AFB

Manager Christopher Long

Location Code OTC536

RFA / COC Number 144106-H003

Sample Number OTC536-IS-0009-MMDDYY

Task

Sample Name OTC536-z-OTC536-IS-0009-MMDDYY-z

Collection Date 06/22/12

Sampling Method Unknown

Sample Type Unknown

Collection Time 0905

Sample Purpose Unknown

Start Depth FGD 3' 10'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 5' 12'

Sampling Equip

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	)(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Rachel Daly 6/22/12

Logged By / Dat

Reviewed By / Dat

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code **OTC536**

RFA / COC Number 144106-H003

Sample Number **OTC536-IS-0010-MMDDYY**

Task

Sample Name **OTC536-z-OTC536-IS-0010-MMDDYY-z**

Collection Date 6/22/12

Sampling Method **Unknown**

Sample Type **Unknown**

Collection Time 1100

Sample Purpose **Unknown**

Start Depth 0'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

End Depth 2'

Sampling Equip Geoprobe

Sample Matrix **SOIL**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

6/22/12

Rachel Daly

Logged By / Dat

Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw Environmental Solutions

Manager Christopher Long

RFA / COC Number 144106-H003

Location Code OTC536

Task

Sample Number OTC536-IS-0011-MMDDYY

Collection Date 06-22-12

Sample Name OTC536-z-OTC536-IS-0011-MMDDYY-z

Collection Time 1500

Sampling Method Unknown

Sample Type Unknown

Start Depth 28'

Sample Purpose Unknown

End Depth 30'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sample Matrix SOIL

Sampling Equip

QC Partners:
(TB) *(EB)* *(FB)*

SampleTeam RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06-22-12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat*

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager **Christopher Long**

Location Code **OTC536** *RFA / COC Number* 144106 - HOLO

Sample Number **OTC536-GW-5361-~~MMDDYY~~** 070412 *Task*

Sample Name **OTC536-z-OTC536-GW-5361-MMDDYY-z** *Collection Date* 070412

Sampling Method ~~Unknown~~ YSI *Sample Type* ~~Unknown~~ Grab *Collection Time* 0930

Sample Purpose ~~Unknown~~ Invest. *Start Depth*

QC Code **NORMAL ENVIRONMENTAL SAMPL** E *End Depth*

Sampling Equip YSI 8620 *Sample Matrix* **GROUND WATER**

QC Partners:

(TB) OTC-TBi-070412 *(EB)* *(FB)* *SampleTeam* CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SW8015B : GRO	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	C	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
SW8015B : ORO	D	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015B : DRO	D	Unknown	2	1	L	1 Liter Amber Glass	H2SO4
PCBs by SW8082A	E	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Explosives by SW8330A	F	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Tritium by 906.0 Mod	G	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Mercury by SW7470A	H	Unknown	0	500	ML	500 ml Poly Container	HNO3
Metals by SW6020A	H	Unknown	0	500	ML	500 ml Poly Container	HNO3
Metals by SW6010C	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
Total CN water by 335.4	I	Unknown	1	500	ML	500 ml Poly Container	NaOH
TDS by 160.1	J	Unknown	1	500	ML	500 ml Poly Container	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Vinson 7/4/12 *Reviewed By / Dat*

Sample Collection Log

Page: ~~19 of 49~~ 1/1
IDW Soil

Shaw Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code ~~FIELDQC~~ IDW

RFA / COC Number HO 38

Sample Number ~~OTC644-GW-0441-MMDDYY-FD~~ LDY-IDWD1-090412

Sample Name ~~FIELDQC-2-OTC644-GW-0441-MMDDYY-FD-z~~

Task

Collection Date 09/04/2012

Sampling Method ~~Unknown~~ Composite

Sample Type ~~Unknown~~ Soil

Collection Time 1330

Sample Purpose ~~Unknown~~ IDW characterization

Start Depth NA

QC Code ~~FIELD DUPLICATE~~ NA

End Depth NA

Sampling Equip Stainless steel trowel/bowl/Aluminum

Sample Matrix ~~GROUND WATER~~ IDW Soil

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam LaThom, Hodu

Containers:

	Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
1)	VOCs by SW8260C TCLP VOCs	A	Unknown	~~3~~ 1	~~40~~ 8oz	~~ML~~	~~40 ml VOA Vials~~ Glass	~~HCL~~ Cool to 4°C
	~~SW8015B : GRO~~	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
2)	SVOCs by SW8270D TCLP SVOCs / other organics	EB	Unknown	~~2~~ 1	8	x oz	~~1 Liter Amber Glass~~ glass	Cool to 4°
	~~SW8015B : GRO~~	D	Unknown	0	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~SW8015B : DRO~~	D	Unknown	2	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~PCBs by SW8082A~~ ~~TCLP~~	E	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
	~~Explosives by SW8330A~~	F	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
3)	~~Tritium by 906.0 Mod~~ RCI	C	Unknown	~~2~~ 1	~~1~~ 8oz		~~1 Liter Amber Glass~~ Glass	~~Cool to 4°C~~ Cool to 4°C
4)	Mercury by SW7470A TCLP Mercury	~~F~~ D	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~ oz	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
5)	Metals by SW6020A TCLP Metals	~~H~~ E	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
	~~Metals by SW6010C~~	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
	~~Total CN water by 335.4~~	I	Unknown	1	500	ML	~~500 ml Poly Container~~	NaOH
	~~TDS by 160.1~~	J	Unknown	1	500	ML	500 ml Poly Container	Cool to 4°

Comments: Composite soil sample for TCLP analyses of IDW cuttings rolloff at Lay down Yard, 09/04/12

Sketch Location: Rolloff box composite sample @ Lay down Yard.

Analyses: TCLP VOCs, TCLP SVOCs, TCLP metals, TCLP Mercury, RCI

LDY = Lay down Yard

~~Shaw~~ *Logged By / Dat* Mel Hall *Reviewed By / Dat* _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code BULK WATER TANK

RFA / COC Number 144106 H070

Sample Number HAFB-IDW-BULK WATER-0001-111612

Task 144106.JM20000

Sample Name HAFB-IDW-BULK WATER-0001-111612

Collection Date 11/16/12

Sampling Method BAILER

Sample Type GRAB

Collection Time 13:00

Sample Purpose CONFIRM IDW

Start Depth N/A

QC Code

End Depth N/A

Sampling Equip DISPOSABLE BAILER

Sample Matrix **WATER**

QC Partners:

(TB) (EB) (FB)

SampleTeam JH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	B	Unknown	4	8	8OZ	Amber Glass	Cool to 4°
SW8015 : ORO	C	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015 : DRO	C	Unknown	1	1	L	1 Liter Amber Glass	H2SO4
Metals by SW6020A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
METALS by SW6020A	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Mercury by SW7470A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Metals by SW6010C	D	Unknown	1	500	ML	500 ml Poly Container	HNO3
	E		1	500	ML	500 ml Poly Cont	Cool to 4°
SW8015 : GRO	F	Unknown	3	40	ML	40 ml VOA Vials	HCL

Comments: SAMPLE COLLECTED FROM BULK WATER STORAGE TANK AFTER ALL WATER DRUMS WERE CONSOLIDATED. SENT BOTH A PRESERVED AND UNPRESERVED 500ML POLY FOR METALS. SPOKE WITH LAB AND THEY SAID TO SEND UNPRESERVED, BUT I THINK MAYBE THEY MADE A MISTAKE.

Sketch Location:

Shaw Logged By / Dat

Reviewed By / Dat

Appendix E
Boring Logs

Boring ID: OT-C536-Station 1

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1199

Date Completed: 6/21/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4094.74
Y Coordinate: 682745.9934
X Coordinate: 1686040.7852

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); light brown; dry; soft.		Hand auger from 0 - 5 ft. Began drilling on 6/21/12.
5		OTC536-IS-0001-062112	NR		Same as above (0 ft).	ML	
10					Same as above (0 ft). Note: gypsum crystals.		
		OTC536-IS-0002-062112	NR		Lean CLAY (CL); mottled brown and white; dry; medium stiff. Same as above (10 ft); red; damp; medium plasticity. Note: gypsum crystals.	CL	
15			NR				Total depth = 15 ft. Reached total depth on 6/21/12. **Water table not encountered in this boring.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:48 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C536-Station 2

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1199

Date Completed: 6/22/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4094.63
Y Coordinate: 682727.2639
X Coordinate: 1686046.1076

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); light brown; dry; soft.		Hand auger from 0 - 5 ft. Began drilling on 6/21/12.
5			NR		Same as above (0 ft); dry to damp.	ML	
10		OTC536-IS-0003-062212 and OTC536-IS-0004-062212-FD	NR		Lean CLAY (CL); mottled red and white; dry; medium stiff to stiff. Note: gypsum crystals.		
15		OTC536-IS-0005-062212	NR		Lean CLAY with Sand (CL); red; damp; soft to medium firm; very fine sand.	CL	
20			NR		Same as above (10 ft).		Total depth = 20 ft. Reached total depth on 6/22/12. **Water table not encountered at this location.
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:48 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C536-Station 3

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1199

Date Completed: 6/22/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4094.17
Y Coordinate: 682716.1511
X Coordinate: 1686042.0428

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); light brown; dry; soft.		Hand auger from 0 - 5 ft. Began drilling on 6/22/12.
5		OTC536-IS-0006-062212	NR		Same as above (0 ft); dry to damp.	ML	
10		OTC536-IS-0007-062212	NR		Lean CLAY (CL); mottled red and white; dry to damp; medium firm to firm. Note: gypsum crystals.	CL	
15			NR				Total depth = 15 ft. Reached total depth on 6/22/12. **Water table not encountered in this boring.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:48 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C536-Station 4 (OTC536-MW01)

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1199

Date Completed: 6/22/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Top of PVC Riser Pipe AMSL (ft): 4094.03
Y Coordinate: 682702.1222
X Coordinate: 1686045.4628

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0		OTC536-IS-0010-062212	NR		SILT (ML); light brown; dry; soft.		Hand auger from 0 - 5 ft. Began drilling on 6/22/12.
5		OTC536-IS-0008-062212	NR		Same as above (0 ft).	ML	
10		OTC536-IS-0009-062212	NR		Lean CLAY (CL); mottled red and white; dry to damp; medium firm to firm. Note: gypsum crystals.		
15			NR		Same as above (10 ft).	CL	
20			NR		Same as above (10 ft); red; damp; firm. Same as above (10 ft). red; damp; firm.		
25			NR		Clayey SAND (SC); red; loose; saturated; very fine sand. Lean CLAY (CL); mottled red and white; damp; firm. Note: gypsum crystals. Clayey SAND (SC); red; wet; loose; very fine sand. Note: trace gypsum crystals.	SC CL SC	
30		OTC536-IS-0011-062212					

Boring ID: OT-C536-Station 4 (OTC536-MW01)

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1199

Date Completed: 6/22/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Top of PVC Riser Pipe AMSL (ft): 4094.03
Y Coordinate: 682702.1222
X Coordinate: 1686045.4628

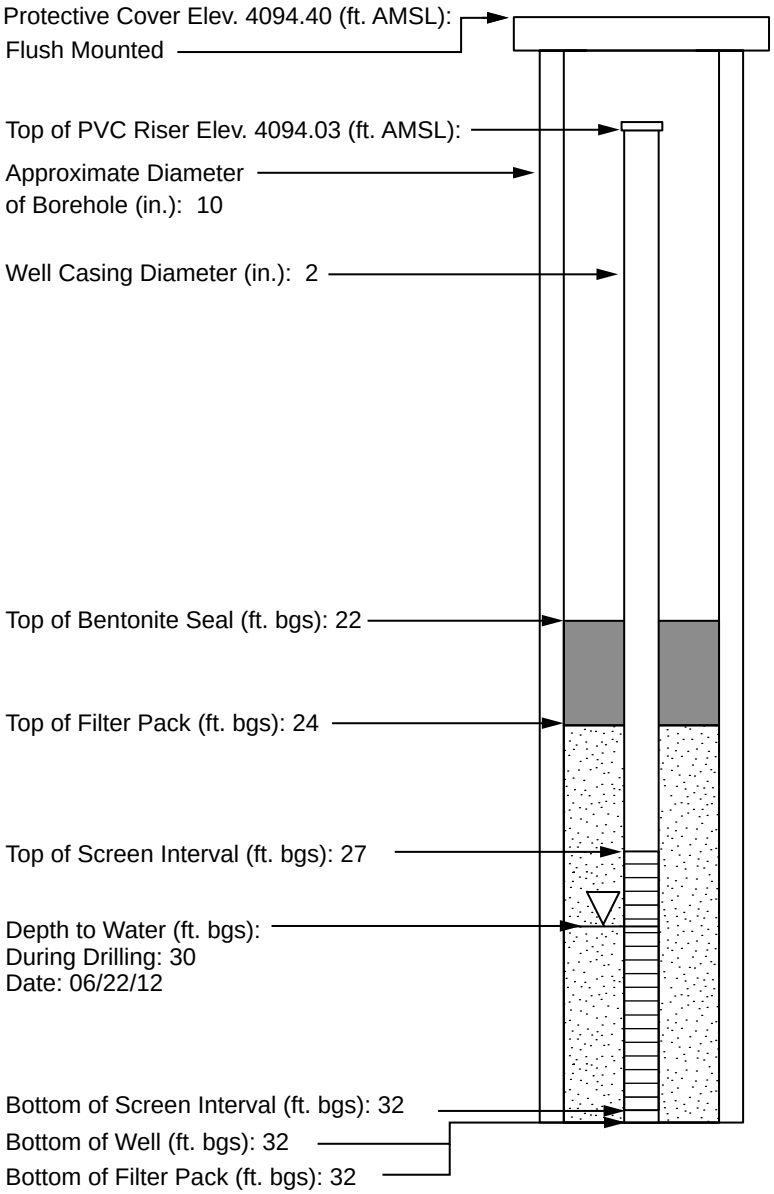
Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
30			NR		Clayey SAND (SC); red; wet; loose; very fine sand. Note: trace gypsum crystals.	SC	
					Lean CLAY (CL); grayish green to brown; moist; firm; high plasticity. Same as above (31.5 ft); red; damp; medium firm.	CL	
35			NR				Total depth = 35 ft. Reached total depth on 6/22/12.
40							
45							
50							
55							
60							

Appendix F
Well Construction Diagrams

Well Construction Diagram

Project: Holloman AFB
Location: OT-C536
Client: USAF
Subcontractor: Major Drilling
Driller: K. Burkhead
Drilling Method/Rig Type: DPT/Auger
Shaw Field Representative: B. Squire

Well Number: OTC536-MW01
Site Location: Building 1199
Installation Date: 06/22/2012
Completion Date: 06/22/2012
Grid Northing: 682702.1222
Grid Easting: 1686045.4628
NAD: 83 SPCS NM Central
NAVD: 88



Not To Scale

Protective Casing: Circular
Type: Flush Mount
Dimensions (in.): 8
Length (in): 10
Guard Post: NA

Ground Seal (Surface pad):
Dimensions (ft.): 2 x 2
Type: Concrete

Annular Space Seal:
Type: Quikcrete and Quikgel Bentonite
Installation: Gravity

Bentonite Seal:
Manufacturer: Enviro Plug
# of Bags: 2 (50 lbs each)
Type: 3/8" Pellets
Installation: Gravity
Hydration time (hrs): 1

Filter Pack Material:
Manufacturer: DSI
Product Name: Well Gravel Pack
Size: GP#3
# of Bags: 3 (50 lbs each)
Installation: Gravity

Well Casing Used (ft.):
Manufacturer: Silverline
Type: PVC Schedule 40
Diameter (in.): 2

Well Screen Casing:
Manufacturer: DSI
Type: 2" Pre-pack w/ vf SS Mesh w/ 1A Sand
Slot Size (in.): 0.010
Slot Type: Factory

Sump/End Cap (in.): 4 (PVC)
Backfill Material: NA

Appendix G
Well Purge Records

Shaw® Shaw E & I

SAMPLING

EXAMPLE
WELL PURGE RECORD

Project Name: HAFB 144106

Location: OTC 536 (Bldg 1199)

Well/Piez. No.: OTC 536 I

Personnel: CH / CL

Date Installed: _____

Date (Start/End): 070412

Csg. Diameter (I.D.): 2"

Method of Development: NA

Total Depth (ft. TOC): 35.22'

☐ Surging ☐ Bailing ☐ Pumping ☐ Other (State Method) _____

☐ Original Development ☐ Redevelopment Development Date: _____

Depth to water ~~before developing well~~ pre-tubing: 26.04'

Height of Water Column: _____ feet _____ = _____ gal.* Purge Factor _____ = Volume To Purge _____

$V = (B * r_c^2 * L_c * 7.48) + (B*(r_w - r_c)^2 * L_s * \phi_s * 7.48) =$ _____ gallons (See Notes below)

Depth purging from: 34' feet

Time purging begins: 0900 pump off 1000

Weather: partly cloudy 75° F

Screened Interval (ft. BGL): _____

Equipment Nos.: ~~pH Meter~~ NA ~~EC Meter~~ NA ~~Turbidity Meter~~ NA

Equipment decontaminated prior to development Y ✓ N _____

Describe YSI 6820 # 483164

Date	Time	Water Level (ft. below TOC)	Volume Removed ~~(gal.)~~ L	Temp (C or F)	pH	~~Cond~~ EC	Turbidity	D.O. mg/L	~~Comments~~ ORP	TDS g/L
070412	0902	26.40	0	20.54	7.00	3.671	12.3	3.51	71.9	2.383
"	0907	26.42	2.5	19.85	6.92	3.639	4.6	2.22	74.2	2.365
"	0912	26.43	5.0	19.77	6.95	3.630	2.2	2.37	67.2	2.358
"	0917	26.41	7.5	19.71	6.91	3.625	0.6	2.18	78.0	2.357
"	0922	26.42	10.0	19.69	6.90	3.619	-0.3	2.19	80.1	2.353
"	0927	26.41	12.5	19.59	6.91	3.617	-1.0	2.29	80.0	2.351
"	0930		Sample							

Final DTW - 26.18'

Notes:

- Water levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to 0.1 pH units
- Electrical conductivity (EC) – Reported to the nearest 10% mhos/cm or
- µmho/cm @25 C or in mS/cm of instrument set range
- Water temperature – Reported to the nearest 0.1 C or F
  feet
- Dissolved oxygen (D.O.) report in 0.1 mg/L
- Turbidity report in NTV nearest whole #

Where:

B=3.14

ϕ_s=porosity of the sand pack

r_c =radius of the well casing and screen in feet

L_c=length of water column inside the casing and screen in

r_w =radius of the well bore in feet

L_s =length of saturated portion of the sand pack in feet

7.48 gallons/cubic foot=conversion from cubic feet to gallons

Appendix H
Site Survey Data

Revised Rpt
09/11/2013
(re: TU/US-C513)
p. 7 of 10

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	682987.8550	1687022.9920	4098.16	BASE	682789.9107	1686534.0572
2	678390.1010	1678735.5020	4064.77	CP-52-P-19	678193.4892	1678248.9690
3	683252.1480	1680789.5360	4078.80	CP-55-JACK	683054.1271	1680302.4077
4	681667.1260	1694574.3780	4140.57	CP-56-AIR	681469.5645	1694083.2546
5	669733.4460	1682234.2110	4048.59	HAFB-07-07	669539.3431	1681746.6640
6	669695.2030	1718768.4150	4157.95	ALAMOAIR	669501.1112	1718270.2797
7	674362.7100	1713591.4300	4160.17	F248	674167.2655	1713094.7951
8	676850.6600	1718114.2590	4193.99	E-248	676654.4944	1717616.3133
50	691964.7620	1687201.2770	4140.90	MALONE	691764.2160	1686712.2905
51	662077.1700	1670356.4250	4077.10	BATE	661885.2861	1669872.3205
52	678390.1080	1678735.5040	4066.10	P 19	678193.4962	1678248.9710
53	644127.0780	1700529.8000	4039.00	MONT	643940.3964	1700036.9506
54	676850.6920	1718114.2670	4193.99	E 248	676654.5264	1717616.3213
55	683252.1970	1680789.5390	4080.20	JACK	683054.1761	1680302.4107
56	681667.0380	1694574.3640	4141.20	AIR	681469.4765	1694083.2406
82	678193.4999	1678248.9801	4064.92	P	677996.9451	1677762.5882
84	676654.5300	1717616.3305	4192.77	E	676458.4212	1717118.5291
85	683054.1798	1680302.4198	4079.02	JACK	682856.2163	1679815.4327
86	681469.4802	1694083.2497	4140.00	AIR	681271.9760	1693592.2686
100	685975.0760	1686614.9100	4101.87	OT-C534-PVC	685776.2660	1686126.0934
101	685975.4260	1686614.8310	4102.28	OT-C534-CASING	685776.6159	1686126.0145
102	685952.4860	1686626.9650	4101.89	OT-C534-W2-PVC	685753.6825	1686138.1449
103	685952.6870	1686626.9300	4102.33	OT-C534-W2-CASING	685753.8834	1686138.1099
104	685939.9110	1686581.7340	4101.89	OT-C534-W1-CASING	685741.1111	1686092.9270
105	685939.6450	1686581.7790	4101.57	OT-C534-W1-PVC	685740.8452	1686092.9720
106	685924.3640	1686619.9800	4101.81	OT-C534-W4-PVC	685725.5687	1686131.1620
107	685924.6590	1686619.8790	4102.23	OT-C534-W4-CASING	685725.8636	1686131.0610
108	685934.1180	1686578.3320	4101.72	OT-C534-LEACH-NG	685735.3198	1686089.5260
109	685935.7830	1686600.7340	4101.88	OT-C534-LEACH-NG	685736.9843	1686111.9215
110	685938.2680	1686607.0980	4101.88	OT-C534-LEACH-NG	685739.4686	1686118.2837
111	685951.4240	1686604.4600	4101.90	OT-C534-LEACH-NG	685752.6208	1686115.6465
112	685953.8200	1686601.1380	4101.88	OT-C534-LEACH-NG	685755.0161	1686112.3254
113	685953.2500	1686596.8650	4101.88	OT-C534-LEACH-NG	685754.4463	1686108.0537
114	685946.2830	1686578.3790	4101.81	OT-C534-LEACH-NG	685747.4813	1686089.5730
115	685945.3070	1686576.3400	4101.88	OT-C534-LEACH-NG	685746.5056	1686087.5346
116	685940.6850	1686575.6580	4101.79	OT-C534-LEACH-NG	685741.8849	1686086.8528
117	685952.3510	1686614.8200	4102.03	OT-C534-LEACH-NG	685753.5475	1686126.0035
118	685953.0040	1686623.0300	4102.13	OT-C534-LEACH-NG	685754.2004	1686134.2111
119	685945.6920	1686623.1960	4102.03	OT-C534-LEACH-NG	685746.8905	1686134.3770
120	685944.8810	1686615.5440	4101.97	OT-C534-LEACH-NG	685746.0797	1686126.7272
121	685948.0570	1686615.1700	4101.97	OT-C534-FLINE-NG	685749.2548	1686126.3534
122	685947.7680	1686606.3420	4101.81	OT-C534-FLINE-NG	685748.9659	1686117.5279
123	685953.2050	1686618.0690	4102.08	OT-C534-ENFLU-NG	685754.4013	1686129.2515
124	685968.5800	1686611.5870	4102.06	OT-C534-ENFLU-NG	685769.7718	1686122.7714
125	686021.5760	1686604.3860	4102.49	OT-C534-ENFLU-NG	685822.7525	1686115.5725
126	686051.0660	1686600.5520	4102.82	OT-C534-ENFLU-NG	685852.2339	1686111.7396
127	682943.9250	1686529.5770	4094.74	OT-C536-STATION1-NG	682745.9934	1686040.7852
128	682925.1900	1686534.9010	4094.63	OT-C536-STATION2-NG	682727.2639	1686046.1076
129	682914.0740	1686530.8350	4094.17	OT-C536-STATION3-NG	682716.1511	1686042.0428
130	682900.2750	1686534.1950	4094.40	MW-OT-C5361-CASING	682702.3561	1686045.4018
131	682900.0410	1686534.2560	4094.03	MW-OT-C5361-PVC	682702.1222	1686045.4628
132	682892.0960	1686514.3610	4094.08	OT-C536-LEACH-NG	682694.1795	1686025.5736
133	682905.9860	1686504.4840	4093.98	OT-C536-LEACH-NG	682708.0654	1686015.6994
134	682914.9460	1686505.2970	4094.10	OT-C536-LEACH-NG	682717.0228	1686016.5122
135	682919.4610	1686521.1490	4094.40	OT-C536-LEACH-NG	682721.5365	1686032.3596
136	682921.1340	1686534.7310	4094.42	OT-C536-LEACH-NG	682723.2091	1686045.9377
137	682919.5910	1686545.0230	4094.72	OT-C536-LEACH-NG	682721.6665	1686056.2267
138	682912.1700	1686551.2270	4094.60	OT-C536-LEACH-NG	682714.2477	1686062.4289
139	682897.7180	1686551.9240	4094.16	OT-C536-LEACH-NG	682699.7998	1686063.1257
140	682892.5110	1686549.8820	4094.18	OT-C536-LEACH-NG	682694.5943	1686061.0843
141	682922.3680	1686533.4440	4094.42	OT-C536-TANKPIT-NG	682724.4427	1686044.6510
142	682920.9800	1686525.5880	4094.39	OT-C536-TANKPIT-NG	682723.0551	1686036.7973
143	682928.0220	1686524.4280	4094.63	OT-C536-TANKPIT-NG	682730.0951	1686035.6377
144	682929.2370	1686532.7090	4094.62	OT-C536-TANKPIT-NG	682731.3097	1686043.9163
145	682949.7020	1686528.9800	4094.75	OT-C536-ENFLU-NG	682751.7688	1686040.1883
146	682921.2900	1686528.9090	4094.41	OT-C536-ENFLU-NG	682723.3650	1686040.1174
147	682916.2970	1686530.1310	4094.27	OT-C536-ENFLU-NG	682718.3735	1686041.3390
148	682877.6850	1686739.3620	4095.03	OT-C533-MW-CASING	682679.7726	1686250.5094
149	682877.4490	1686739.4350	4094.68	OT-C533-MW-PVC	682679.5367	1686250.5823
150	682884.2550	1686735.8390	4094.76	OT-C533-LEACH-NG	682686.3407	1686246.9874
151	682877.4700	1686734.1690	4094.84	OT-C533-LEACH-NG	682679.5577	1686245.3179

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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
152	682871.6400	1686736.6530	4094.83	OT-C533-LEACH-NG	682673.7294	1686247.8011
153	682869.4200	1686738.9370	4094.89	OT-C533-LEACH-NG	682671.5100	1686250.0845
154	682868.8760	1686741.4810	4094.99	OT-C533-LEACH-NG	682670.9662	1686252.6277
155	682867.8710	1686756.1100	4095.03	OT-C533-LEACH-NG	682669.9615	1686267.2525
156	682857.6950	1686766.0680	4095.35	OT-C533-LEACH-NG	682659.7884	1686277.2076
157	682855.8760	1686772.9280	4095.39	OT-C533-LEACH-NG	682657.9700	1686284.0656
158	682855.6590	1686783.4130	4095.46	OT-C533-LEACH-NG	682657.7530	1686294.5476
159	682855.5230	1686790.0690	4095.47	OT-C533-LEACH-NG	682657.6171	1686301.2017
160	682857.2270	1686794.8730	4095.42	OT-C533-LEACH-NG	682659.3206	1686306.0043
161	682858.6900	1686813.7880	4095.55	OT-C533-LEACH-NG	682660.7832	1686324.9138
162	682867.9360	1686816.7350	4095.32	OT-C533-LEACH-NG	682670.0265	1686327.8599
163	682880.0660	1686814.6740	4095.00	OT-C533-LEACH-NG	682682.1530	1686325.7995
164	682891.9700	1686818.7840	4094.82	OT-C533-LEACH-NG	682694.0535	1686329.9083
165	682901.1340	1686806.7570	4094.86	OT-C533-LEACH-NG	682703.2148	1686317.8848
166	682889.7110	1686785.0140	4094.98	OT-C533-LEACH-NG	682691.7952	1686296.1481
167	682889.3190	1686757.8750	4094.96	OT-C533-LEACH-NG	682691.4033	1686269.0170
168	682886.6550	1686745.7080	4094.83	OT-C533-LEACH-NG	682688.7400	1686256.8535
169	682895.8900	1686814.7130	4095.19	OT-C533-FFLUEN-NG	682697.9724	1686325.8385
170	682901.8890	1686814.2530	4095.86	OT-C533-FFLUEN-TPAD	682703.9696	1686325.3787
171	682901.5970	1686811.8220	4095.84	OT-C533-SEPTIC-TCONC	682703.6777	1686322.9484
172	682911.5820	1686810.3750	4095.77	OT-C533-SEPTIC-TCONC	682713.6598	1686321.5018
173	682912.4280	1686815.4170	4095.77	OT-C533-SEPTIC-TCONC	682714.5056	1686326.5423
174	682902.3730	1686816.8390	4095.84	OT-C533-SEPTIC-TCONC	682704.4535	1686327.9639
175	682912.0910	1686812.7560	4095.77	OT-C533-EFLUEN-TCONC	682714.1687	1686323.8821
176	682923.3600	1686810.9450	4095.29	OT-C533-EFLUEN-NG	682725.4344	1686322.0716
177	682942.2940	1686810.3140	4095.49	OT-C533-EFLUEN-NG	682744.3629	1686321.4408
178	682937.5080	1686805.9000	4095.30	OT-C533-STATION1-NG	682739.5783	1686318.0278
179	682906.2780	1686808.8380	4094.86	OT-C533-STATION2-NG	682708.3574	1686319.9652
180	682895.2770	1686813.2080	4094.98	OT-C533-STATION3-NG	682697.3595	1686324.3340
181	700191.9570	1695605.3730	4181.72	OT-C540-STATION1-ASP	699989.0266	1695113.9508
182	700173.9260	1695611.2520	4181.82	OT-C540-STATION2-NG	699971.0008	1695119.8281
183	700168.8930	1695604.5390	4181.39	OT-C540-STATION3-NG	699965.9693	1695113.1170
184	700151.2700	1695598.6630	4180.49	OT-C540-STATION4-NG	699948.3514	1695107.2427
185	700158.9630	1695593.9090	4180.86	OT-C540-LEACH-NG	699956.0422	1695102.4901
186	700150.2560	1695603.0840	4180.78	OT-C540-LEACH-NG	699947.3377	1695111.6625
187	700152.8330	1695609.6400	4180.81	OT-C540-LEACH-NG	699949.9139	1695118.2166
188	700155.1660	1695611.7200	4180.89	OT-C540-LEACH-NG	699952.2463	1695120.2960
189	700161.1020	1695611.3470	4181.11	OT-C540-LEACH-NG	699958.1805	1695119.9231
190	700163.7200	1695601.1600	4181.06	OT-C540-LEACH-NG	699960.7978	1695109.7390
191	700161.5790	1695596.1920	4181.05	OT-C540-LEACH-NG	699958.6574	1695104.7725
192	700165.7400	1695603.7570	4181.48	OT-C540-FFLUEN-NG	699962.8172	1695112.3353
193	700170.8520	1695608.8530	4181.93	OT-C540-FFLUEN-NG	699967.9277	1695117.4298
194	700170.7290	1695606.7600	4182.01	OT-C540-SEPTIC-NG	699967.8048	1695115.3374
195	700176.8760	1695605.4490	4181.91	OT-C540-SEPTIC-NG	699973.9500	1695114.0268
196	700177.5910	1695612.4300	4181.92	OT-C540-SEPTIC-NG	699974.6648	1695121.0058
197	700172.1930	1695613.9030	4182.05	OT-C540-SEPTIC-NG	699969.2683	1695122.4783
198	700177.7030	1695608.9790	4181.69	OT-C540-EFLUEN-NG	699974.7767	1695117.5558
199	700205.8220	1695608.1850	4181.85	OT-C540-EFLUEN-ASPH	700002.8876	1695116.7620
200	700246.4300	1695613.4690	4182.95	OT-C540-EFLUEN-ASPH	700043.4838	1695122.0445
201	700238.4930	1695614.0360	4182.51	OT-C540-BLDGCOR	700035.5491	1695122.6113
202	700228.4390	1695608.1640	4182.55	OT-C540-BLDGCOR	700025.4980	1695116.7410
203	700227.0510	1695568.0300	4182.87	OT-C540-BLDGCOR	700024.1104	1695076.6186
204	700236.9380	1695557.6950	4183.02	OT-C540-BLDGCOR	700033.9946	1695066.2866
205	688305.7410	1690609.5510	4126.46	TU\US-C507-STATION1-	688106.2555	1690119.5767
206	688309.7220	1690614.0760	4126.51	TU\US-C507-STATION2-	688110.2353	1690124.1004
207	688306.7130	1690619.4150	4126.45	TU\US-C507-STATION3-	688107.2272	1690129.4378
208	688313.7000	1690621.8280	4126.37	TU\US-C507-STATION4-	688114.2122	1690131.8501
209	688313.7950	1690607.6410	4126.36	TU\US-C507-STATION5-	688114.3071	1690117.6673
210	688304.0140	1690620.9730	4126.47	TU\US-C507-USTPIT-AS	688104.5290	1690130.9954
211	688304.3040	1690607.3010	4126.54	TU\US-C507-USTPIT-AS	688104.8189	1690117.3274
212	688317.4320	1690607.1780	4126.54	TU\US-C507-USTPIT-AS	688117.9431	1690117.2044
213	688317.6000	1690622.2860	4126.57	TU\US-C507-USTPIT-AS	688118.1110	1690132.3080
214	688320.7590	1690623.9670	4127.18	TU\US-C507-BLDGCOR	688121.2691	1690133.9885
215	688330.7630	1690627.7570	4125.65	TU\US-C507-BLDGCOR	688131.2702	1690137.7774
216	688318.5520	1690598.7120	4126.71	TU\US-C507-BLDGCOR	688119.0628	1690108.7408
217	688306.5580	1690598.9520	4126.69	TU\US-C507-BLDGCOR	688107.0722	1690108.9808
218	688287.5740	1690592.3200	4126.83	TU\US-C507-EXMW1	688088.0937	1690102.3507
219	688287.4600	1690625.9270	4126.36	TU\US-C507-EXMW2	688087.9798	1690135.9480
220	689216.8690	1680453.8850	4087.76	TU\US-C501-STATION4-	689017.1194	1679966.8540
221	689203.4000	1680450.4300	4087.80	TU\US-C501-STATION1-	689003.6543	1679963.4000
222	689227.9170	1680449.2880	4087.78	TU\US-C501-STATION2-	689028.1642	1679962.2584

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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
223	689201.2820	1680437.6020	4087.96	TU\US-C501-STATION3-	689001.5369	1679950.5757
224	689204.0090	1680426.7550	4087.80	TU\US-C501-STATION5-	689004.2631	1679939.7319
225	689200.5240	1680440.6650	4087.95	TU\US-C501-BLDGCOR-N	689000.7792	1679953.6379
226	689191.1430	1680432.8740	4088.07	TU\US-C501-BLDGCOR-N	688991.4009	1679945.8491
227	689202.0960	1680449.8730	4087.79	TU\US-C501-TANKPIT-N	689002.3507	1679962.8432
228	689201.5860	1680440.8210	4087.99	TU\US-C501-TANKPIT-N	689001.8408	1679953.7938
229	689191.7450	1680432.9310	4088.07	TU\US-C501-TANKPIT-N	688992.0027	1679945.9061
230	689195.4710	1680423.1750	4087.88	TU\US-C501-TANKPIT-N	688995.7276	1679936.1529
231	689207.1960	1680422.4490	4087.92	TU\US-C501-TANKPIT-N	689007.4492	1679935.4271
232	689229.2900	1680431.3210	4087.77	TU\US-C501-TANKPIT-N	689029.5368	1679944.2966
233	689231.6150	1680444.1310	4087.67	TU\US-C501-TANKPIT-N	689031.8611	1679957.1029
234	689227.5450	1680454.7320	4087.83	TU\US-C501-TANKPIT-N	689027.7923	1679967.7008
235	689218.0540	1680463.3780	4088.03	TU\US-C501-TANKPIT-N	689018.3041	1679976.3443
236	689209.0460	1680458.6260	4087.92	TU\US-C501-TANKPIT-N	689009.2987	1679971.5937
237	689237.1630	1680445.1670	4087.64	TU\US-C501-COMMLINE-	689037.4075	1679958.1386
238	689219.6050	1680436.9770	4088.00	TU\US-C501-COMMLINE-	689019.8546	1679949.9509
239	689199.7540	1680431.6770	4088.06	TU\US-C501-COMMLINE-	689000.0094	1679944.6525
240	689181.3550	1680425.0490	4088.20	TU\US-C501-COMMLINE-	688981.6157	1679938.0264
241	689162.6180	1680417.3900	4088.35	TU\US-C501-COMMLINE-	688962.8841	1679930.3696
242	689161.5970	1680417.5650	4088.56	TU\US-C501-COMMVAULT	688961.8634	1679930.5446
243	689157.8580	1680421.3400	4088.11	TU\US-C501-COMMVAULT	688958.1255	1679934.3185
244	689150.8680	1680414.5760	4088.10	TU\US-C501-COMMVAULT	688951.1375	1679927.5564
245	689154.6050	1680410.8830	4088.46	TU\US-C501-COMMVAULT	688954.8735	1679923.8645
246	687246.6430	1686873.0010	4105.82	OT-C535-STATION1-NG	687047.4644	1686384.1096
247	687270.5400	1686861.6690	4105.63	OT-C535-STATION2-NG	687071.3545	1686372.7809
248	687282.8340	1686866.7860	4105.85	OT-C535-STATION3-NG	687083.6449	1686377.8964
249	687303.5940	1686788.5490	4105.12	OT-C535-STATION4-NG	687104.3989	1686299.6821
250	687291.9640	1686793.7970	4105.27	OT-C535-LEACH-NG	687092.7723	1686304.9286
251	687304.7930	1686782.8770	4105.17	OT-C535-LEACH-NG	687105.5976	1686294.0117
252	687323.6740	1686798.1880	4105.34	OT-C535-LEACH-NG	687124.4731	1686309.3183
253	687319.7080	1686817.5380	4105.82	OT-C535-LEACH-NG	687120.5083	1686328.6627
254	687307.4400	1686838.9610	4105.76	OT-C535-LEACH-NG	687108.2438	1686350.0795
255	687297.0830	1686856.5380	4106.04	OT-C535-LEACH-NG	687097.8898	1686367.6514
256	687290.0540	1686837.9200	4105.59	OT-C535-LEACH-NG	687090.8628	1686349.0388
257	687291.3760	1686806.0200	4105.33	OT-C535-LEACH-NG	687092.1845	1686317.1480
258	687284.5890	1686864.5150	4106.11	OT-C535-FFLUEN-NG	687085.3994	1686375.6261
259	687276.8290	1686868.4490	4106.19	OT-C535-FFLUEN-NG	687077.6417	1686379.5589
260	687276.0820	1686870.8490	4106.28	OT-C535-SEPTIC-NG	687076.8949	1686381.9583
261	687263.3720	1686869.7190	4105.87	OT-C535-SEPTIC-NG	687064.1886	1686380.8286
262	687263.7200	1686863.5770	4105.95	OT-C535-SEPTIC-NG	687064.5365	1686374.6884
263	687276.4840	1686862.8870	4106.07	OT-C535-SEPTIC-NG	687077.2968	1686373.9986
264	687263.5270	1686868.1150	4105.92	OT-C535-EFLUEN-NG	687064.3435	1686379.2250
265	687228.9570	1686874.1570	4105.71	OT-C535-EFLUEN-NG	687029.7836	1686385.2653
266	687235.2230	1686881.4610	4106.05	OT-C535-BLDGCOR-NG	687036.0477	1686392.5672
267	687225.9150	1686892.3360	4105.90	OT-C535-BLDGCOR-NG	687026.7424	1686403.4390
268	687232.0250	1686844.5370	4105.92	OT-C535-BLDGCOR-NG	687032.8507	1686355.6539
269	687221.4890	1686835.3400	4105.63	OT-C535-BLDGCOR-NG	687022.3177	1686346.4595
270	677637.2460	1692755.6660	4110.24	TU/US-C505-MW1-CASIN	677440.8524	1692265.0697
271	677636.9990	1692755.6590	4109.84	TU/US-C505-MW1-PVC	677440.6055	1692265.0627
272	677634.4160	1692722.3930	4110.42	TU/US-C505-WELLATEMP	677438.0233	1692231.8064
273	677659.4620	1692742.2400	4110.34	TU/US-C505-WELLATEMP	677463.0620	1692251.6476
274	677701.9500	1692799.3200	4110.17	TU/US-C505-USTPIT-NG	677505.5377	1692308.7111
275	677701.3830	1692789.3010	4110.35	TU/US-C505-USTPIT-NG	677504.9708	1692298.6950
276	677711.5570	1692789.5280	4110.64	TU/US-C505-USTPIT-NG	677515.1419	1692298.9219
277	677710.8940	1692799.1130	4110.24	TU/US-C505-USTPIT-NG	677514.4791	1692308.5041
278	677707.4060	1692790.0820	4110.35	TU/US-C505-STATION1-	677510.9921	1692299.4757
279	677702.3100	1692795.0710	4110.20	TU/US-C505-STATION2-	677505.8976	1692304.4633
280	677705.6610	1692797.9500	4110.13	TU/US-C505-STATION3-	677509.2476	1692307.3415
281	677710.4770	1692793.8740	4110.09	TU/US-C505-STATION4-	677514.0622	1692303.2666
282	677706.4200	1692793.8350	4110.12	TU/US-C505-STATION5-	677510.0064	1692303.2276
283	677694.5060	1692779.7220	4110.88	TU/US-C505-BLDGCOR-N	677498.0958	1692289.1187
284	677704.1940	1692790.4680	4110.28	TU/US-C505-BLDGCOR-N	677507.7810	1692299.8616
285	677754.5670	1692783.0890	4110.79	TU/US-C505-BLDGCOR-N	677558.1394	1692292.4848
286	677743.8570	1692795.1680	4110.70	TU/US-C505-BLDGCOR-N	677547.4325	1692304.5603
287	686300.2320	1672933.0350	4060.98	OT-C542-MW-CASING-	686101.3277	1672448.1837
288	686300.2350	1672933.0550	4060.98	OT-C542-MW-PVC	686101.3307	1672448.2037
289	686274.4020	1672914.6520	4061.01	OT-C542-LEACH-NG	686075.5052	1672429.8061
290	686289.6710	1672938.5250	4060.76	OT-C542-LEACH-NG	686090.7698	1672453.6721
291	686294.6900	1672941.1720	4060.83	OT-C542-LEACH-NG	686095.7873	1672456.3184
292	686301.6970	1672938.9490	4060.85	OT-C542-LEACH-NG	686102.7923	1672454.0960
293	686305.7170	1672936.2850	4060.87	OT-C542-LEACH-NG	686106.8111	1672451.4328

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
294	686308.0670	1672931.0550	4060.89	OT-C542-LEACH-NG	686109.1604	1672446.2043
295	686304.8000	1672917.9090	4060.82	OT-C542-LEACH-NG	686105.8944	1672433.0621
296	686292.3740	1672901.2590	4060.90	OT-C542-LEACH-NG	686093.4720	1672416.4169
297	686283.4190	1672906.7050	4060.97	OT-C542-FFLUEN-NG	686084.5196	1672421.8614
298	686280.3770	1672902.6520	4060.94	OT-C542-FFLUEN-NG	686081.4785	1672417.8095
299	686276.9070	1672904.6420	4060.95	OT-C542-SEPTIC-NG	686078.0095	1672419.7990
300	686271.2980	1672896.9550	4060.80	OT-C542-SEPTIC-NG	686072.4021	1672412.1142
301	686281.9530	1672889.9350	4060.83	OT-C542-SEPTIC-NG	686083.0540	1672405.0962
302	686287.0950	1672896.6800	4060.88	OT-C542-SEPTIC-NG	686088.1945	1672411.8393
303	686285.7900	1672894.7150	4060.83	OT-C542-EFLUEN-NG	686086.8899	1672409.8748
304	686299.2270	1672887.1560	4060.87	OT-C542-EFLUEN-NG	686100.3230	1672402.3180
305	686310.9860	1672881.5880	4061.18	OT-C542-EFLUEN-NG	686112.0786	1672396.7516
306	686294.2970	1672858.0380	4060.90	OT-C542-BLDGCOR-NG	686095.3944	1672373.2085
307	686295.8820	1672844.1310	4061.28	OT-C542-BLDGCOR-NG	686096.9790	1672359.3055
308	686345.1390	1672922.4560	4060.89	OT-C542-BLDGCOR-NG	686146.2217	1672437.6078
309	686358.9780	1672924.0940	4061.42	OT-C542-BLDGCOR-NG	686160.0567	1672439.2453
310	686291.8860	1672885.1500	4060.65	OT-C542-STATION1-NG	686092.9841	1672400.3126
311	686275.2730	1672891.5340	4060.63	OT-C542-STATION2-NG	686076.3760	1672406.6948
312	686281.5390	1672904.6340	4060.73	OT-C542-STATION2-NG	686082.6401	1672419.7910
313	685750.1690	1671530.2910	4055.60	OT-C543-STATION2-NG	685551.4241	1671045.8463
314	685734.0730	1671548.8090	4055.84	OT-C543-STATION2	685535.3328	1671064.3589
315	685727.7350	1671514.3350	4055.33	OT-C543-STATION3	685528.9966	1671029.8949
316	685749.4390	1671546.6740	4055.91	OT-C543-EXSEPTIC	685550.6944	1671062.2245
317	685732.6430	1671545.5190	4055.74	OT-C543-EXSEPTIC	685533.9032	1671061.0699
318	685741.2600	1671557.0720	4056.32	OT-C543-EXSEPTIC	685542.5177	1671072.6195
319	685738.1510	1671537.7290	4055.62	OT-C543-EXSEPTIC	685539.4096	1671053.2821
320	685734.3520	1671541.2760	4055.65	OT-C543-FFLUEN	685535.6117	1671056.8281
321	685716.0920	1671515.5090	4055.04	OT-C543-FFLUEN	685517.3570	1671031.0686
322	685708.2650	1671520.5800	4055.23	OT-C543-LEACH	685509.5323	1671036.1381
323	685688.3040	1671512.0560	4055.52	OT-C543-LEACH	685489.5771	1671027.6166
324	685669.5610	1671502.3840	4055.36	OT-C543-LEACH	685470.8395	1671017.9474
325	685659.9210	1671495.2130	4055.04	OT-C543-LEACH	685461.2023	1671010.7784
326	685670.4020	1671495.5660	4055.43	OT-C543-MW-CASING	685471.6803	1671011.1313
327	685670.1370	1671495.6580	4055.13	OT-C543-MW-PVC	685471.4153	1671011.2233
328	685682.2550	1671485.7460	4055.16	OT-C543-LEACH	685483.5298	1671001.3142
329	685699.8070	1671491.2750	4054.76	OT-C543-LEACH	685501.0767	1671006.8416
330	685710.4840	1671499.0550	4055.06	OT-C543-LEACH	685511.7506	1671014.6193
331	685721.5030	1671508.4730	4055.40	OT-C543-LEACH	685522.7664	1671024.0346
332	685794.8190	1671498.3320	4056.84	OT-C543-EFLUEN	685596.0612	1671013.8965
333	685809.3600	1671495.0820	4059.27	OT-C543-BLDGCOR	685610.5980	1671010.6475
334	685776.9050	1671465.9090	4060.02	OT-C543-BLDGCOR	685578.1524	1670981.4829
335	685785.4230	1671455.8900	4060.26	OT-C543-BLDGCOR	685586.6679	1670971.4668
336	685744.8400	1671542.1950	4055.76	OT-C543-EFLUEN	685546.0967	1671057.7468
337	685303.6520	1671072.3550	4048.79	OT-C544-MW-CASING	685105.0365	1670588.0430
338	685303.3550	1671072.2840	4048.52	OT-C544-MW-PVC	685104.7396	1670587.9720
339	685349.4970	1671083.9730	4052.43	OT-C544-STATION1	685150.8683	1670599.6576
340	685342.4960	1671086.5980	4051.55	OT-C544-STATION1	685143.8693	1670602.2819
341	685336.0530	1671085.0120	4050.99	OT-C544-STATION1	685137.4282	1670600.6963
342	685336.7000	1671089.5480	4051.15	OT-C544-SEPTIC	685138.0750	1670605.2310
343	685338.4520	1671075.7050	4051.30	OT-C544-SEPTIC	685139.8265	1670591.3920
344	685347.8050	1671077.3720	4052.23	OT-C544-SEPTIC	685149.1768	1670593.0585
345	685345.6600	1671089.9410	4052.38	OT-C544-SEPTIC	685147.0324	1670605.6239
346	685356.1020	1671079.9660	4041.22	OT-C544-EFLUEN	685157.4713	1670595.6518
347	685347.2700	1671081.8770	4052.36	OT-C544-EFLUEN	685148.6419	1670597.5622
348	685337.4940	1671082.4320	4051.31	OT-C544-FFLUEN	685138.8687	1670598.1171
349	685335.1290	1671082.2690	4051.14	OT-C544-FFLUEN	685136.5044	1670597.9541
350	685336.2280	1671075.8560	4050.85	OT-C544-LEACH	685137.6031	1670591.5430
351	685323.3310	1671071.0830	4049.91	OT-C544-LEACH	685124.7098	1670586.7714
352	685297.8990	1671068.1360	4048.16	OT-C544-LEACH	685099.2852	1670583.8252
353	685296.9990	1671078.2660	4047.94	OT-C544-LEACH	685098.3855	1670593.9523
354	685317.0900	1671090.9580	4049.62	OT-C544-LEACH	685118.4707	1670606.6406
355	685334.6940	1671090.0750	4050.81	OT-C544-LEACH	685136.0696	1670605.7579
356	685360.4020	1671127.4140	4053.89	OT-C544-BLDGCOR	685161.7701	1670643.0860
357	685349.8450	1671114.5020	4052.32	OT-C544-BLDGCOR	685151.2162	1670630.1778
358	685360.3480	1671033.1240	4052.96	OT-C544-BLDGCOR	685161.7161	1670548.8234
359	685371.1230	1671022.2010	4053.70	OT-C544-BLDGCOR	685172.4880	1670537.9035
360	669828.5970	1693339.1960	4077.44	TU/US-C503-STATION1	669634.4665	1692848.4306
361	669823.8520	1693340.4930	4077.30	TU/US-C503-STATION2	669629.7229	1692849.7272
362	669816.1660	1693331.0930	4077.32	TU/US-C503-STATION3	669622.0391	1692840.3299
363	669804.9830	1693324.1990	4077.14	TU/US-C503-STATION5	669610.8594	1692833.4379
364	669830.2120	1693344.6950	4077.63	TU/US-C503-STATION4	669636.0811	1692853.9280

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
365	669820.3680	1693343.5050	4078.10	TU/US-C503-USTTANK	669626.2399	1692852.7383
366	669826.9160	1693337.2450	4077.78	TU/US-C503-USTTANK	669632.7860	1692846.4802
367	669831.7020	1693342.9300	4077.73	TU/US-C503-USTTANK	669637.5706	1692852.1635
368	669817.5060	1693300.2710	4077.28	TU/US-C503-BLDGCOR	669623.3788	1692809.5169
369	669817.0280	1693314.4610	4077.69	TU/US-C503-BLDGCOR	669622.9009	1692823.7028
370	669870.4630	1693326.6030	4077.24	TU/US-C503-BLDGCOR	669676.3204	1692835.8412
371	669857.6770	1693326.9550	4077.12	TU/US-C503-BLDGCOR	669663.5381	1692836.1931
372	669799.9830	1693280.8270	4076.53	TU/US-C503-BLDGCOR	669605.8608	1692790.0785
373	669786.0040	1693280.0690	4077.00	TU/US-C503-BLDGCOR	669591.8859	1692789.3207
374	669753.1970	1693299.5360	4076.55	TU/US-C503-MW1-CASIN	669559.0884	1692808.7821
375	669753.0160	1693299.6510	4076.22	TU/US-C503-MW1-PVC	669558.9075	1692808.8971
376	669717.9520	1693348.6000	4074.92	TU/US-C503-MW3-PVC	669523.8536	1692857.8319
377	669718.0930	1693348.2730	4075.65	TU/US-C503-MW3-CASIN	669523.9946	1692857.5050
378	669746.8950	1693329.2100	4076.92	TU/US-C503-BLDGCOR	669552.7882	1692838.4475
379	669747.5820	1693308.1150	4076.21	TU/US-C503-BLDGCOR	669553.4750	1692817.3586
380	669906.5180	1693361.1640	4077.43	TU/US-C503-MW2-CASIN	669712.3650	1692870.3922
381	669906.2520	1693361.2650	4077.07	TU/US-C503-MW2-PVC	669712.0990	1692870.4932
382	669887.0390	1693344.8910	4077.53	TU/US-C503-BLDGCOR	669692.8916	1692854.1239
383	669886.0230	1693359.0930	4077.99	TU/US-C503-BLDGCOR	669691.8759	1692868.3218
384	670862.3470	1691695.2520	4072.78	TU/US-C500-MW1-CASIN	670667.9169	1691204.9630
385	670862.1340	1691695.4850	4072.39	TU/US-C500-MW1-PVC	670667.7040	1691205.1960
386	670897.1420	1691671.0590	4072.25	TU/US-C500-MW2-PVC	670702.7019	1691180.7771
387	670897.3420	1691670.8340	4072.66	TU/US-C500-MW2-CASIN	670702.9018	1691180.5521
388	670997.2710	1691721.0890	4072.90	TU/US-C500-MW3-CASIN	670802.8018	1691230.7926
389	670996.9840	1691721.2540	4072.41	TU/US-C500-MW3-PVC	670802.5149	1691230.9575
390	670952.1640	1691699.4910	4072.04	TU/US-C500-STATION1	670757.7079	1691209.2008
391	670948.0960	1691682.1740	4072.36	TU/US-C500-STATION4	670753.6411	1691191.8888
392	670936.4590	1691683.8290	4072.05	TU/US-C500-STATION5	670742.0075	1691193.5434
393	670929.6330	1691690.0950	4072.11	TU/US-C500-STATION2	670735.1834	1691199.8075
394	670923.0530	1691673.0510	4072.18	TU/US-C500-STATION3	670728.6054	1691182.7685
395	670946.5050	1691708.7370	4072.40	TU/US-C500-USTPIT	670752.0506	1691218.4441
396	670961.7540	1691693.8260	4072.62	TU/US-C500-USTPIT	670767.2951	1691203.5375
397	670931.1680	1691662.3970	4072.93	TU/US-C500-USTPIT	670736.7180	1691172.1176
398	670915.4940	1691676.4560	4072.43	TU/US-C500-USTPIT	670721.0485	1691186.1725
399	670921.7940	1691667.6910	4072.61	TU/US-C500-BLDGCOR	670727.3467	1691177.4100
400	670938.3020	1691685.3670	4072.19	TU/US-C500-BLDGCOR	670743.8499	1691195.0809
401	670954.8550	1691686.5260	4072.52	TU/US-C500-BLDGCOR	670760.3981	1691196.2396
402	670964.2580	1691691.8600	4072.50	TU/US-C500-BLDGCOR	670769.7984	1691201.5720
403	670981.1410	1691692.8760	4072.84	TU/US-C500-BLDGCOR	670786.6765	1691202.5877
404	681138.2190	1690535.4430	4109.80	OT-C538-MW1-CASING	680940.8108	1690045.4902
405	681137.9660	1690535.5040	4109.43	OT-C538-MW1-PVC	680940.5579	1690045.5512
406	681154.3000	1690506.8540	4109.64	OT-C538-STATION3	680956.8871	1690016.9095
407	681170.7650	1690504.3700	4110.30	OT-C538-STATION2	680973.3473	1690014.4262
408	681207.7160	1690542.9160	4110.07	OT-C538-STATION1	681010.2876	1690052.9610
409	681171.2020	1690513.1430	4110.35	OT-C538-SEPTIC	680973.7842	1690023.1966
410	681160.8350	1690514.8700	4110.22	OT-C538-SEPTIC	680963.4202	1690024.9231
411	681157.5830	1690502.2430	4109.87	OT-C538-SEPTIC	680960.1692	1690012.2998
412	681168.6240	1690500.8410	4110.30	OT-C538-SEPTIC	680971.2070	1690010.8982
413	681157.7430	1690507.8780	4109.92	OT-C538-FFLUEN	680960.3291	1690017.9332
414	681149.7900	1690513.8560	4109.82	OT-C538-FFLUEN	680952.3784	1690023.9094
415	681146.2870	1690511.1610	4109.76	OT-C538-LEACH	680948.8764	1690021.2152
416	681140.0690	1690516.2140	4109.76	OT-C538-LEACH	680942.6602	1690026.2667
417	681131.8360	1690535.6580	4109.59	OT-C538-LEACH	680934.4296	1690045.7051
418	681142.3480	1690541.6090	4109.45	OT-C538-LEACH	680944.9386	1690051.6544
419	681148.4850	1690524.6340	4109.80	OT-C538-LEACH	680951.0738	1690034.6843
420	681152.9240	1690518.6140	4110.01	OT-C538-LEACH	680955.5115	1690028.6661
421	681171.0630	1690513.0040	4110.32	OT-C538-EFLUEN	680973.6453	1690023.0577
422	681199.3120	1690534.6340	4109.92	OT-C538-EFLUEN	681001.8861	1690044.6814
423	681311.9210	1690619.8910	4111.94	OT-C538-EFLUEN	681114.4624	1690129.9137
424	681378.0600	1690614.8720	4112.52	OT-C538-EFLUEN	681180.5823	1690124.8962
425	681511.9950	1690621.0250	4112.35	OT-C538-EFLUEN-C/O	681314.4785	1690131.0474
426	681543.8210	1690614.3290	4112.13	OT-C538-EFLUEN-C/O	681346.2952	1690124.3533
427	681545.1500	1690624.0320	4110.59	OT-C538-EFLUEN	681347.6238	1690134.0535
428	681526.9290	1690617.7410	4112.19	OT-C538-BLDGCOR	681329.4081	1690127.7643
429	681516.5600	1690627.6780	4112.22	OT-C538-BLDGCOR	681319.0421	1690137.6984
430	681517.0030	1690674.6590	4112.55	OT-C538-BLDGCOR	681319.4850	1690184.6658
431	681526.9640	1690685.0850	4112.68	OT-C538-BLDGCOR	681329.4431	1690195.0888
432	681610.3380	1690617.1910	4112.15	OT-C538-BLDGCOR	681412.7929	1690127.2145
433	681620.0290	1690626.9090	4112.29	OT-C538-BLDGCOR	681422.4811	1690136.9297
434	681248.7970	1690511.7190	4110.11	OT-C537-STATION1	681051.3567	1690021.7731
435	681230.2540	1690505.9940	4109.96	OT-C537-STATION2	681032.8191	1690016.0497

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
436	681220.0430	1690509.7920	4110.12	OT-C537-STATION3	681022.6111	1690019.8466
437	681224.9030	1690501.6020	4109.95	OT-C537-SEPTICDRY	681027.4697	1690011.6590
438	681224.2220	1690518.0560	4110.28	OT-C537-SEPTICDRY	681026.7889	1690028.1082
439	681236.7540	1690518.9910	4110.31	OT-C537-SEPTICDRY	681039.3172	1690029.0429
440	681236.4080	1690501.8520	4110.13	OT-C537-SEPTICDRY	681038.9713	1690011.9089
441	681237.2180	1690508.8330	4110.12	OT-C537-INLINE	681039.7811	1690018.8879
442	681311.7430	1690515.4440	4111.03	OT-C537-INLINE	681114.2845	1690025.4970
443	670561.7210	1680587.5740	4050.10	TU/US-C506-MW2-CASIN	670367.3781	1680100.5043
444	670561.4170	1680587.6760	4049.68	TU/US-C506-MW2-PVC	670367.0742	1680100.6062
445	670504.3430	1680580.0920	4050.14	TU/US-C506-MW1-PVC	670310.0167	1680093.0244
446	670504.5340	1680580.0020	4050.56	TU/US-C506-MW1-CASIN	670310.2076	1680092.9345
447	670508.2600	1680580.6030	4050.26	TU/US-C506-USTTANK	670313.9326	1680093.5353
448	670507.1490	1680575.9500	4050.27	TU/US-C506-USTTANK	670312.8219	1680088.8836
449	670517.9280	1680578.9030	4050.27	TU/US-C506-USTTANK	670323.5978	1680091.8358
450	670517.4300	1680574.2280	4050.28	TU/US-C506-USTTANK	670323.0999	1680087.1621
451	670507.9350	1680578.1630	4050.18	TU/US-C506-STATION1	670313.6077	1680091.0960
452	670513.3690	1680579.8330	4050.20	TU/US-C506-STATION2	670319.0401	1680092.7655
453	670517.9640	1680576.4150	4050.25	TU/US-C506-STATION3	670323.6338	1680089.3485
454	670511.2330	1680575.3810	4050.12	TU/US-C506-STATION4	670316.9047	1680088.3148
455	670512.5770	1680577.6370	4050.16	TU/US-C506-STATION5	670318.2483	1680090.5702
456	670485.1820	1680557.6150	4050.53	TU/US-C506-EXMW1-CAS	670290.8613	1680070.5540
457	670484.8980	1680557.6790	4050.38	TU/US-C506-EXMW1-PVC	670290.5773	1680070.6179
458	670494.8180	1680553.5430	4050.36	TU/US-C506-BLDGCOR	670300.4945	1680066.4831
459	670506.7310	1680561.7710	4050.38	TU/US-C506-BLDGCOR	670312.4040	1680074.7088
460	670510.1770	1680607.5970	4050.36	TU/US-C506-BLDGCOR	670315.8490	1680120.5215
461	670507.2460	1680618.1900	4050.39	TU/US-C506-BLDGCOR	670312.9189	1680131.1114
462	672564.5350	1692766.5990	4084.67	OT-C530-STATION1	672369.6116	1692275.9995
463	672567.1650	1692774.7240	4084.79	OT-C530-STATION2	672372.2409	1692284.1222
464	672567.5210	1692771.2850	4084.93	OT-C530-ACTSEPTIC	672372.5967	1692280.6842
465	672572.0780	1692767.3740	4084.89	OT-C530-ACTSEPTIC	672377.1524	1692276.7743
466	672575.8660	1692771.9070	4084.91	OT-C530-ACTSEPTIC	672380.9393	1692281.3060
467	672571.4280	1692775.8290	4084.95	OT-C530-ACTSEPTIC	672376.5026	1692285.2269
468	672569.6900	1692769.3550	4084.91	OT-C530-INLINE	672374.7651	1692278.7547
469	672563.6000	1692772.1360	4084.83	OT-C530-MW-CASING	672368.6769	1692281.5349
470	672563.2920	1692772.2960	4084.49	OT-C530-MW-PVC	672368.3690	1692281.6949
471	672509.9810	1692700.4750	4085.41	OT-C530-INLINE	672315.0734	1692209.8947
472	672538.3940	1692677.7240	4085.37	OT-C530-BLDGCOR	672343.4782	1692187.1503
473	672538.9710	1692663.8680	4085.27	OT-C530-BLDGCOR	672344.0550	1692173.2983
474	672478.3960	1692731.8290	4085.45	OT-C530-BLDGCOR	672283.4976	1692241.2396
475	672485.2490	1692739.1720	4085.12	OT-C530-BLDGCOR	672290.3486	1692248.5805
476	685978.3640	1686617.0530	4101.95	OT-C534-STATION1	685779.5530	1686128.2358
477	685949.9370	1686623.2970	4101.80	OT-C534-STATION2	685751.1342	1686134.4780
478	686041.6810	1686591.0650	4102.58	OT-C534-BLDGCOR	685842.8517	1686102.2553
479	686050.4200	1686580.6970	4102.78	OT-C534-BLDGCOR	685851.5881	1686091.8903
480	686053.7100	1686616.8100	4102.90	OT-C534-BLDGCOR	685854.8772	1686127.9929
481	686043.1140	1686607.6280	4102.82	OT-C534-BLDGCOR	685844.2842	1686118.8135
482	670482.5190	1680558.2400	4050.60	TU/US-C506-MW3-CASIN	670288.1990	1680071.1788
483	670482.3210	1680558.1750	4050.11	TU/US-C506-MW3-PVC	670288.0011	1680071.1138
484	669451.6250	1685381.2210	4054.88	TU/US-C515-STATION1	669257.6038	1684892.7620
485	669456.5920	1685373.9060	4054.66	TU/US-C515-STATION2	669262.5694	1684885.4491
486	669447.7270	1685364.3830	4054.13	TU/US-C515-STATION3	669253.7069	1684875.9289
487	669442.7430	1685375.3260	4054.34	TU/US-C515-STATION4	669248.7244	1684886.8687
488	669450.0780	1685373.9310	4054.62	TU/US-C515-STATION5	669256.0572	1684885.4741
489	669529.8630	1685390.3120	4053.57	TU/US-C515-MW3-PVC	669335.8191	1684901.8503
490	669530.0710	1685390.1630	4053.84	TU/US-C515-MW3-CASIN	669336.0271	1684901.7014
491	669347.3380	1685357.3580	4053.37	TU/US-C515-MW2-CASIN	669153.3470	1684868.9059
492	669347.0390	1685357.4240	4052.93	TU/US-C515-MW2-PVC	669153.0481	1684868.9719
493	669367.7310	1685396.1250	4053.43	TU/US-C515-MW1-PVC	669173.7341	1684907.6617
494	669368.0180	1685396.0880	4053.86	TU/US-C515-MW1-CASIN	669174.0210	1684907.6247
495	669413.7390	1685386.4140	4054.97	TU/US-C515-BLDGCOR	669219.7288	1684897.9535
496	669405.0760	1685397.5400	4056.39	TU/US-C515-BLDGCOR	669211.0683	1684909.0762
497	669442.6490	1685383.8010	4054.90	TU/US-C515-TANKPIT	669248.6304	1684895.3412
498	669458.4310	1685381.6630	4055.08	TU/US-C515-TANKPIT	669264.4078	1684893.2039
499	669454.7400	1685363.6010	4054.47	TU/US-C515-TANKPIT	669260.7179	1684875.1471
500	669440.8050	1685364.3540	4054.07	TU/US-C515-TANKPIT	669246.7869	1684875.8999
501	669474.3460	1685377.9770	4054.82	TU/US-C515-BLDGCOR	669280.3182	1684889.5189
502	669485.4880	1685386.3880	4055.07	TU/US-C515-BLDGCOR	669291.4570	1684897.9275
503	669257.8420	1685415.0700	4053.20	TU/US-C513-STATION3	669063.8770	1684926.6012
504	669241.6200	1685431.8260	4053.43	TU/US-C513-STATION2	669047.6597	1684943.3523
505	669234.6840	1685421.2410	4053.75	TU/US-C513-STATION5	669040.7257	1684932.7704
506	669232.2550	1685409.8190	4053.42	TU/US-C513-STATION4	669038.2974	1684921.3517

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

Corrections

Point #515
TU/US-515-MW3 PVC

Point #518
TU/US-515-MW2

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
507	669220.1400	1685422.8010	4053.52	TU/US-C513-STATION1	669026.1859	1684934.3299
508	669222.4590	1685431.2530	4053.64	TU/US-C513-TANKPIT	669028.5042	1684942.7795
509	669219.3990	1685411.0450	4054.92	TU/US-C513-TANKPIT	669025.4451	1684922.5773
510	669260.7320	1685426.0370	4053.70	TU/US-C513-TANKPIT	669066.7661	1684937.5650
511	669277.6950	1685433.5720	4053.31	TU/US-C513-MW2-CASIN	669083.7242	1684945.0978
512	669243.5650	1685418.8110	4054.36	TU/US-C513-TRANSPAD	669049.6041	1684930.3411
513	669236.4970	1685419.8090	4054.30	TU/US-C513-TRANSPAD	669042.5381	1684931.3388
514	669235.5680	1685411.9050	4054.57	TU/US-C513-TRANSPAD	669041.6094	1684923.4371
515	669277.6850	1685433.6210	4053.26	TU/US-C513-MW2-C[illegible] PVC	669083.7142	1684945.1468 → MW3
516	669188.9570	1685441.5400	4053.76	TU/US-C513-MW1-CASIN	668995.0119	1684953.0635
517	669188.7180	1685441.6230	4053.31	TU/US-C513-MW1-PVC	668994.7730	1684953.1465
518	669175.0530	1685411.5360	4053.78	TU/US-C513-MW3-PVC	668981.1120	1684923.0682 → MW2
519	669175.2900	1685411.4450	4054.15	TU/US-C513-MW3-CASIN	668981.3489	1684922.9772
520	669194.6820	1685411.4540	4054.72	TU/US-C513-BLDGCOR	669000.7353	1684922.9862
521	669205.8290	1685420.1440	4054.47	TU/US-C513-BLDGCOR	669011.8790	1684931.6737
522	669292.6520	1685418.3920	4053.83	TU/US-C513-BLDGCOR	669098.6769	1684929.9222
523	669293.9380	1685428.2990	4053.77	TU/US-C513-BLDGCOR	669099.9625	1684939.8263
524	685879.9040	1686627.7590	4102.02	OTC-534-CASING	685681.1215	1686138.9387
525	685879.6290	1686627.7910	4101.61	OTC-534-PVC	685680.8466	1686138.9707
526	685894.0510	1686651.2940	4102.15	OTC-534-MW6-CASING	685695.2644	1686162.4669
527	685893.7240	1686651.3020	4101.74	OTC-534-MW6-PVC	685694.9375	1686162.4749
528	685866.3710	1686655.8860	4101.59	OTC-534-MW8-PVC	685667.5925	1686167.0576
529	685866.6060	1686655.6520	4102.06	OTC-534-MW8-CASING	685667.8274	1686166.8236
530	685876.1160	1686687.3140	4102.11	OTC-534-MW5-CASING	685677.3346	1686198.4764
531	685875.8760	1686687.4250	4101.81	OTC-534-MW5-PVC	685677.0947	1686198.5874
532	685834.9910	1686704.4610	4101.83	OTC-534-MW9-PVC	685636.2216	1686215.6185
533	685835.2820	1686704.5300	4102.15	OTC-534-MW9-CASING	685636.5125	1686215.6875
534	685772.4780	1686595.2240	4101.45	OTC-534-MW10-NG	685573.7267	1686106.4131
535	669081.1480	1678793.1860	4046.72	OTC-531B-SEPTANK	668887.2342	1678306.6363
536	669082.4390	1678801.3130	4046.63	OTC-531B-SEPTANK	668888.5248	1678314.7610
537	669072.3810	1678802.9790	4046.81	OTC-531B-SEPTANK	668878.4697	1678316.4265
538	669070.8860	1678795.3530	4046.82	OTC-531B-SEPTANK	668876.9751	1678308.8027
539	669104.1410	1678787.7690	4045.69	OTC-531B-STATION-1	668910.2205	1678301.2209
540	669070.9690	1678801.9800	4046.52	OTC-531B-STATION-2	668877.0581	1678315.4278
541	669061.4820	1678787.2510	4046.24	OTC-531B-STATION-3	668867.5739	1678300.7031
542	669022.2810	1678760.4940	4045.98	OTC-531B-MW-1-PVC	668828.3842	1678273.9538
543	669022.4740	1678760.4670	4046.35	OTC-531B-MW-1-CASING	668828.5772	1678273.9268
544	669029.7060	1678750.8610	4046.12	OTC-531B-LEACH	668835.8071	1678264.3236
545	669044.0770	1678753.3070	4046.04	OTC-531B-LEACH	668850.1739	1678266.7689
546	669048.2090	1678762.3910	4046.19	OTC-531B-LEACH	668854.3047	1678275.8503
547	669052.8600	1678773.5200	4046.17	OTC-531B-LEACH	668858.9544	1678286.9760
548	669051.8580	1678782.0380	4046.19	OTC-531B-LEACH	668857.9527	1678295.4916
549	669045.9680	1678791.0410	4045.97	OTC-531B-LEACH	668852.0644	1678304.4920
550	669037.6080	1678787.3270	4046.05	OTC-531B-LEACH	668843.7068	1678300.7790
551	669030.8940	1678787.9690	4046.07	OTC-531B-LEACH	668836.9947	1678301.4208
552	669024.6850	1678794.4050	4045.99	OTC-531B-LEACH	668830.7875	1678307.8550
553	669012.0060	1678808.0140	4045.98	OTC-531B-LEACH	668818.1122	1678321.4600
554	669005.0390	1678788.3970	4045.95	OTC-531B-LEACH	668811.1472	1678301.8487
555	669008.1540	1678771.5710	4046.05	OTC-531B-LEACH	668814.2613	1678285.0276
556	669012.3090	1678761.0960	4046.10	OTC-531B-LEACH	668818.4151	1678274.5556
557	669052.5660	1678784.6580	4046.08	OTC-531B-FLINE	668858.6605	1678298.1108
558	669071.4380	1678798.9230	4046.55	OTC-531B-FLINE	668877.5270	1678312.3717
559	669082.2160	1678797.7200	4046.58	OTC-531B-ELINE	668888.3019	1678311.1690
560	669109.7160	1678792.3340	4045.64	OTC-531B-ELINE	668915.7939	1678305.7846
561	669130.6340	1678787.5660	4047.05	OTC-531B-ELINE	668936.7058	1678301.0180
562	669132.6960	1678800.0880	4046.87	OTC-531B-BLDGCOR	668938.7672	1678313.5363
563	669139.6540	1678804.9540	4046.97	OTC-531B-BLDGCOR	668945.7232	1678318.4009
564	669127.3740	1678771.5760	4046.72	OTC-531B-BLDGCOR	668933.4468	1678285.0326
565	669131.8520	1678764.6150	4047.25	OTC-531B-BLDGCOR	668937.9235	1678278.0736
566	668593.1300	1678901.9680	4046.19	OTC-531C-BLDGCOR	668399.3576	1678415.3868
567	668588.1250	1678902.8360	4046.21	OTC-531C-BLDGCOR	668394.3541	1678416.2546
568	668585.3350	1678865.5840	4046.55	OTC-531C-BLDGCOR	668391.5649	1678379.0133
569	668590.1110	1678858.6070	4046.53	OTC-531C-BLDGCOR	668396.3395	1678372.0384
570	668590.3090	1678889.4560	4045.95	OTC-531C-ELINE	668396.5374	1678402.8784
571	668578.4210	1678891.4650	4046.03	OTC-531C-ELINE	668384.6529	1678404.8868
572	668560.7680	1678894.7530	4045.47	OTC-531C-ELINE	668367.0050	1678408.1739
573	668535.6480	1678899.2930	4046.35	OTC-531C-ELINE	668341.8923	1678412.7126
574	668535.0660	1678896.4960	4046.68	OTC-531C-SEPTIC	668341.3104	1678409.9164
575	668535.3940	1678905.9700	4046.47	OTC-531C-SEPTIC	668341.6383	1678419.3876
576	668522.2510	1678906.9450	4046.51	OTC-531C-SEPTIC	668328.4992	1678420.3624
577	668522.3100	1678897.4040	4046.39	OTC-531C-SEPTIC	668328.5581	1678410.8241

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
578	668561.9930	1678890.5660	4045.66	OTC-531C-STATION-1	668368.2296	1678403.9881
579	668531.2500	1678902.0810	4046.55	OTC-531C-STATION-2	668337.4955	1678415.4998
580	668522.9580	1678893.5110	4045.84	OTC-531C-STATION-3	668329.2059	1678406.9323
581	668521.6100	1678902.7660	4046.16	OTC-531C-FLINE	668327.8583	1678416.1846
582	668515.2610	1678901.5740	4045.66	OTC-531C-FLINE	668321.5112	1678414.9929
583	668515.8520	1678907.4010	4045.67	OTC-531C-LEACH	668322.1020	1678420.8182
584	668498.6960	1678906.8280	4045.81	OTC-531C-LEACH	668304.9510	1678420.2454
585	668489.9270	1678907.6430	4045.74	OTC-531C-LEACH	668296.1845	1678421.0602
586	668481.5760	1678902.8790	4045.69	OTC-531C-LEACH	668287.8359	1678416.2975
587	668476.1180	1678891.3230	4045.84	OTC-531C-LEACH	668282.3795	1678404.7449
588	668473.4290	1678883.0340	4045.68	OTC-531C-LEACH	668279.6913	1678396.4583
589	668473.7340	1678874.2510	4045.53	OTC-531C-LEACH	668279.9962	1678387.6778
590	668476.2360	1678867.2340	4045.54	OTC-531C-LEACH	668282.4975	1678380.6629
591	668482.1720	1678868.3950	4045.45	OTC-531C-MW-1-PVC	668288.4318	1678381.8235
592	668482.4510	1678868.3680	4045.85	OTC-531C-MW-1-CASING	668288.7107	1678381.7965
593	668490.9400	1678863.0190	4045.60	OTC-531C-LEACH	668297.1972	1678376.4491
594	668503.3450	1678866.8310	4045.87	OTC-531C-LEACH	668309.5986	1678380.2600
595	668508.4050	1678874.1920	4045.93	OTC-531C-LEACH	668314.6572	1678387.6189
596	668515.8970	1678879.7420	4045.82	OTC-531C-LEACH	668322.1470	1678393.1672
597	668524.3970	1678890.3500	4045.70	OTC-531C-LEACH	668330.6445	1678403.7722
598	667495.6300	1679128.7300	4042.53	OTC-532-BLDGCOR	667302.1757	1678642.0831
599	667488.6400	1679123.9580	4042.71	OTC-532-BLDGCOR	667295.1877	1678637.3125
600	667462.6660	1679059.4970	4041.10	OTC-532-BLDGCOR	667269.2212	1678572.8701
601	667481.1840	1679050.1710	4042.61	OTC-532-BLDGCOR	667287.7339	1678563.5469
602	667486.0130	1679106.7520	4042.73	OTC-532-ELINE	667292.5615	1678620.1115
603	667462.4800	1679111.5030	4040.38	OTC-532-ELINE	667269.0353	1678624.8611
604	667462.2250	1679114.4150	4040.62	OTC-532-STATION-1	667268.7804	1678627.7722
605	667442.0090	1679119.1410	4041.24	OTC-532-STATION-2	667248.5702	1678632.4969
606	667419.1640	1679115.1840	4040.86	OTC-532-STATION-3	667225.7319	1678628.5410
607	667385.6930	1679101.6040	4040.50	OTC-532-STATION-4	667192.2706	1678614.9649
608	667381.8850	1679101.5680	4040.62	OTC-532-LEACH	667188.4637	1678614.9290
609	667383.6400	1679091.6130	4040.63	OTC-532-LEACH	667190.2181	1678604.9768
610	667385.4250	1679087.0370	4040.57	OTC-532-LEACH	667192.0026	1678600.4022
611	667388.9960	1679084.4040	4040.65	OTC-532-LEACH	667195.5726	1678597.7699
612	667394.2390	1679084.6140	4040.73	OTC-532-LEACH	667200.8141	1678597.9799
613	667396.1210	1679092.7430	4040.70	OTC-532-LEACH	667202.6955	1678606.1065
614	667398.1240	1679100.9150	4040.70	OTC-532-LEACH	667204.6979	1678614.2761
615	667402.2360	1679106.9240	4040.75	OTC-532-LEACH	667208.8088	1678620.2834
616	667410.1270	1679109.8530	4040.82	OTC-532-LEACH	667216.6975	1678623.2116
617	667419.4540	1679110.1630	4040.85	OTC-532-LEACH	667226.0218	1678623.5215
618	667420.7270	1679120.1400	4041.02	OTC-532-FLINE	667227.2944	1678633.4956
619	667423.8510	1679141.7780	4040.59	OTC-532-LEACH	667230.4175	1678655.1273
620	667412.2990	1679143.4760	4040.74	OTC-532-LEACH	667218.8688	1678656.8248
621	667403.7350	1679143.1670	4040.80	OTC-532-LEACH	667210.3073	1678656.5159
622	667397.0900	1679139.6510	4040.75	OTC-532-LEACH	667203.6642	1678653.0009
623	667384.3300	1679127.9250	4040.44	OTC-532-LEACH	667190.9079	1678641.2783
624	667382.6070	1679116.1130	4040.44	OTC-532-LEACH	667189.1854	1678629.4697
625	667430.4810	1679118.6630	4041.32	OTC-532-FLINE	667237.0456	1678632.0190
626	667430.2210	1679114.2980	4041.25	OTC-532-SEPTIC	667236.7856	1678627.6553
627	667440.5880	1679113.0200	4041.26	OTC-532-SEPTIC	667247.1496	1678626.3776
628	667442.9470	1679123.3120	4041.21	OTC-532-SEPTIC	667249.5080	1678636.6667
629	667430.1210	1679125.8580	4041.28	OTC-532-SEPTIC	667236.6857	1678639.2119
630	667441.8110	1679116.2010	4041.27	OTC-532-ELINE	667248.3723	1678629.5577
631	669659.5140	1678688.1920	4048.05	OTC-531A-ELINE	669465.4326	1678201.6728
632	669645.1200	1678691.4170	4047.42	OTC-531A-ELINE	669451.0427	1678204.8968
633	669626.5240	1678694.6570	4048.54	OTC-531A-ELINE	669432.4521	1678208.1359
634	669625.4550	1678690.5680	4048.58	OTC-531A-SEPTIC	669431.3834	1678204.0481
635	669627.0130	1678697.2200	4048.59	OTC-531A-SEPTIC	669432.9410	1678210.6981
636	669614.1180	1678700.1730	4048.60	OTC-531A-SEPTIC	669420.0497	1678213.6503
637	669613.0940	1678693.8150	4048.72	OTC-531A-SEPTIC	669419.0260	1678207.2941
638	669648.5430	1678685.0250	4047.24	OTC-531A-STATION-1	669454.4647	1678198.5067
639	669615.3510	1678691.9600	4048.59	OTC-531A-STATION-2	669421.2823	1678205.4397
640	669607.0140	1678691.1700	4048.42	OTC-531A-STATION-3	669412.9478	1678204.6499
641	669606.7200	1678688.2040	4048.56	OTC-531A-LEACH	669412.6539	1678201.6848
642	669608.9270	1678706.1330	4048.28	OTC-531A-LEACH	669414.8602	1678219.6086
643	669601.3790	1678707.8980	4048.13	OTC-531A-LEACH	669407.3144	1678221.3730
644	669593.2420	1678708.2220	4047.49	OTC-531A-LEACH	669399.1798	1678221.6970
645	669578.1380	1678708.5010	4047.22	OTC-531A-LEACH	669384.0801	1678221.9759
646	669565.0490	1678706.1840	4047.29	OTC-531A-LEACH	669370.9949	1678219.6595
647	669554.2260	1678694.3690	4047.37	OTC-531A-LEACH	669360.1751	1678207.8480
648	669553.4160	1678687.6760	4047.59	OTC-531A-LEACH	669359.3653	1678201.1569

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
649	669552.5940	1678678.4030	4047.76	OTC-531A-LEACH	669358.5435	1678191.8866
650	669550.0120	1678656.4050	4047.76	OTC-531A-LEACH	669355.9623	1678169.8950
651	669556.1880	1678652.3190	4047.86	OTC-531A-LEACH	669362.1365	1678165.8102
652	669559.2580	1678655.8340	4047.38	OTC-531A-MW-1-PVC	669365.2056	1678169.3241
653	669559.5100	1678655.7600	4047.78	OTC-531A-MW-1-CASING	669365.4575	1678169.2502
654	669561.9190	1678650.8880	4047.69	OTC-531A-LEACH	669367.8658	1678164.3796
655	669569.0970	1678659.8040	4048.02	OTC-531A-LEACH	669375.0418	1678173.2930
656	669574.5390	1678669.0420	4047.77	OTC-531A-LEACH	669380.4822	1678182.5283
657	669580.0480	1678677.6210	4047.77	OTC-531A-LEACH	669385.9896	1678191.1048
658	669581.1180	1678685.2190	4047.72	OTC-531A-LEACH	669387.0593	1678198.7006
659	669589.3790	1678690.0080	4047.91	OTC-531A-LEACH	669395.3179	1678203.4882
660	669598.7410	1678687.4540	4047.88	OTC-531A-LEACH	669404.6772	1678200.9350
661	669608.6000	1678697.8630	4048.38	OTC-531A-FLINE	669414.5333	1678211.3410
662	669613.4950	1678697.0050	4048.61	OTC-531A-FLINE	669419.4269	1678210.4832
663	669434.7190	1685385.1220	4055.15	US/TC-515-EXAVATION	669240.7027	1684896.6618
664	669433.7320	1685375.0770	4054.68	US/TC-515-EXAVATION	669239.7160	1684886.6198
665	669453.6100	1685372.2880	4054.89	US/TC-515-EXAVATION	669259.5882	1684883.8316
666	669455.2490	1685382.6100	4055.08	US/TC-515-EXAVATION	669261.2268	1684894.1506
667	669423.1290	1685379.3360	4054.73	US/TC-515-POTHOLE-1	669229.1161	1684890.8775
668	669443.7270	1685362.1260	4054.20	US/TC-515-POTHOLE-2	669249.7081	1684873.6725
669	669443.2340	1685352.4030	4053.69	US/TC-515-POTHOLE-3	669249.2152	1684863.9523
670	669388.8600	1685382.9350	4054.36	US/TC-515-POTHOLE-4	669194.8570	1684894.4755
671	666075.3380	1693454.3920	4059.75	US/TC-502-TANK/EX	665882.2953	1692963.5932
672	666064.5480	1693454.6090	4059.59	US/TC-502-TANK/EX	665871.5084	1692963.8101
673	666064.5890	1693463.2320	4059.66	US/TC-502-TANK/EX	665871.5494	1692972.4306
674	666075.7420	1693463.6580	4059.85	US/TC-502-TANK/EX	665882.6992	1692972.8565
675	666070.2430	1693458.8620	4059.56	US/TC-502-STATION-1	665877.2018	1692968.0619
676	666075.3470	1693459.1030	4059.61	US/TC-502-STATION-2	665882.3043	1692968.3028
677	666070.4890	1693455.0470	4059.46	US/TC-502-STATION-3	665877.4477	1692964.2480
678	666070.2650	1693463.1340	4059.49	US/TC-502-STATION-4	665877.2238	1692972.3327
679	666072.2440	1693503.2780	4060.12	US/TC-502-FIREHY	665879.2022	1693012.4650
680	669813.9600	1693315.1950	4077.70	US/TC-503-EXAVATION	669619.8338	1692824.4365
681	669826.0790	1693326.7460	4077.45	US/TC-503-EXAVATION	669631.9493	1692835.9842
682	669815.4720	1693337.1950	4077.67	US/TC-503-EXAVATION	669621.3454	1692846.4302
683	669803.8000	1693324.4750	4077.59	US/TC-503-EXAVATION	669609.6767	1692833.7139
684	669818.2990	1693319.1730	4077.48	US/TC-503-BEGTRENCH	669624.1715	1692828.4134
685	669837.0790	1693303.2490	4076.88	US/TC-503-ENDTRENCH	669642.9461	1692812.4940
686	681138.0180	1690539.4590	4109.33	OTC-538-STATION-5	680940.6098	1690049.5050
687	673758.3950	1683356.5480	4060.55	US/TC-514-STATION-1	673563.1256	1682868.6758
688	673765.5540	1683358.1250	4060.47	US/TC-514-STATION-2	673570.2825	1682870.2523
689	673770.0890	1683350.4240	4060.48	US/TC-514-STATION-3	673574.8162	1682862.5535
690	673768.2490	1683354.2670	4060.48	US/TC-514-STATION-4	673572.9768	1682866.3954
691	673777.4280	1683353.4050	4060.71	US/TC-514-STATION-5	673582.1531	1682865.5337
692	673776.8350	1683359.0390	4060.94	US/TC-514-BLDGCOR	673581.5603	1682871.1661
693	673769.7480	1683353.9100	4060.70	US/TC-514-BLDGCOR	673574.4753	1682866.0385
694	673778.8570	1683370.4750	4060.92	US/TC-514-BLDGCOR	673583.5817	1682882.5987
695	673773.9440	1683377.3380	4060.70	US/TC-514-BLDGCOR	673578.6701	1682889.4597
696	673723.3370	1683411.0030	4060.56	US/TC-514-MW-1-PVC	673528.0778	1682923.1150
697	673723.6160	1683410.9000	4061.02	US/TC-514-MW-1-CASIN	673528.3567	1682923.0120
698	673699.2890	1683380.7720	4061.09	US/TC-514-MW-2-CASIN	673504.0367	1682892.8928
699	673698.9660	1683380.8260	4060.66	US/TC-514-MW-2-PVC	673503.7138	1682892.9467
700	673812.5550	1683317.4880	4060.43	US/TC-514-MW-3-PVC	673617.2699	1682829.6271
701	673812.8820	1683317.4350	4060.76	US/TC-514-MW-3-CASIN	673617.5968	1682829.5741
702	673776.7270	1683350.1350	4060.82	US/TC-514-FORM/TANK	673581.4523	1682862.2646
703	673777.3420	1683356.4370	4060.94	US/TC-514-FORM/TANK	673582.0671	1682868.5648
704	673759.1130	1683359.4810	4061.06	US/TC-514-FORM/TANK	673563.8434	1682871.6079
705	673757.7990	1683353.3170	4061.32	US/TC-514-FORM/TANK	673562.5298	1682865.4457
706	678061.9490	1684350.2580	4078.63	US/TC-516-FORMTANK	677865.4323	1683862.0978
707	678072.0100	1684348.4740	4078.61	US/TC-516-FORMTANK	677875.4904	1683860.3143
708	678074.0860	1684360.1530	4078.25	US/TC-516-FORMTANK	677877.5658	1683871.9899
709	678065.1290	1684362.4260	4078.47	US/TC-516-FORMTANK	677868.6114	1683874.2622
710	678069.6040	1684359.8850	4078.30	US/TC-516-STATION-1	677873.0851	1683871.7220
711	678064.5960	1684356.9350	4078.34	US/TC-516-STATION-2	677868.0786	1683868.7728
712	678066.1670	1684350.4200	4078.54	US/TC-516-STATION-3	677869.6491	1683862.2597
713	678072.9250	1684354.8490	4078.09	US/TC-516-STATION-4	677876.4052	1683866.6874
714	678101.7280	1684311.2380	4077.72	US/TC-516-MW-2	677905.1998	1683823.0891
715	678116.9250	1684291.3650	4077.78	US/TC-516-MW-2	677920.3924	1683803.2218
716	678061.7680	1684335.2520	4080.38	US/TC-516-BLDGCOR	677865.2514	1683847.0961
717	678064.6310	1684348.2080	4081.07	US/TC-516-BLDGCOR	677868.1136	1683860.0484
718	678026.7560	1684390.7900	4078.49	US/TC-516-MW-1	677830.2495	1683902.6180
719	678014.0050	1684363.8290	4077.81	US/TC-516-MW-3	677817.5022	1683875.6648

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
720	671269.9880	1692357.3370	4075.08	US/TC-508-FORM/TANK	671075.4398	1691866.8562
721	671299.4450	1692330.8640	4075.18	US/TC-508-FORM/TANK	671104.8883	1691840.3908
722	671324.3300	1692358.5130	4075.17	US/TC-508-FORM/TANK	671129.7661	1691868.0318
723	671294.8560	1692384.8580	4075.02	US/TC-508-FORM/TANK	671100.3006	1691894.3692
724	671311.5950	1692346.0080	4075.12	US/TC-508-STATION-2	671117.0347	1691855.5304
725	671302.2680	1692357.1830	4075.07	US/TC-508-STATION-1	671107.7104	1691866.7022
726	671312.4640	1692368.2800	4074.98	US/TC-508-STATION-4	671117.9035	1691877.7960
727	671282.5110	1692369.9060	4075.01	US/TC-508-STATION-3	671087.9592	1691879.4215
728	671289.2400	1692342.4620	4075.15	US/TC-508-STATION-5	671094.6862	1691851.9855
729	671373.3210	1692386.6060	4075.00	US/TC-508-MW-3-PVC	671178.7429	1691896.1167
730	671373.6120	1692386.5000	4075.33	US/TC-508-MW-3-CASIN	671179.0338	1691896.0107
731	671216.9160	1692488.1670	4075.54	US/TC-508-SS18-MW08-CASIN	671022.3832	1691997.6482
732	671216.7110	1692488.4340	4075.26	US/TC-508-SS18-MW08-PVC	671022.1782	1691997.9152
733	671236.3110	1692301.9320	4075.19	US/TC-508-MW-2-CASIN	671041.7726	1691811.4672
734	671236.1240	1692302.1450	4074.80	US/TC-508-MW-2-PVC	671041.5856	1691811.6801
735	671211.3090	1692324.4610	4075.35	US/TC-508-MW-1-CASIN	671016.7778	1691833.9897
736	671211.0360	1692324.6620	4074.93	US/TC-508-MW-1-PVC	671016.5049	1691834.1906
737	671174.1880	1692241.9700	4074.81	US/TC-508-SS18-MW16-PVC	670979.6676	1691751.5226
738	671174.4770	1692241.7880	4075.34	US/TC-508-SS18-MW16-CASIN	670979.9565	1691751.3406
739	671035.8870	1692106.1030	4074.42	US/TC-508-SS18-MW18-CASIN	670841.4066	1691615.6950
740	671035.6230	1692106.3690	4073.74	US/TC-508-SS18-MW18-PVC	670841.1427	1691615.9609
741	671043.1730	1692355.2630	4075.73	US/TC-508-SS18-MW19-PVC	670848.6905	1691864.7828
742	670383.2120	1691278.5670	4072.57	US/TC-504-MW-2-CASIN	670188.9208	1690788.3988
743	670383.0220	1691278.7790	4072.19	US/TC-504-MW-2-PVC	670188.7309	1690788.6107
744	670343.7050	1691297.2270	4072.57	US/TC-504-MW-1-PVC	670149.4253	1690807.0534
745	670343.9460	1691296.8630	4072.80	US/TC-504-MW-1-CASIN	670149.6662	1690806.6895
746	669680.3630	1678704.0610	4048.54	OTC-531A-BLDGCOR	669486.2755	1678217.5372
747	669673.4280	1678699.1340	4048.44	OTC-531A-BLDGCOR	669479.3425	1678212.6116
748	669662.1160	1678671.3190	4048.32	OTC-531A-BLDGCOR	669468.0338	1678184.8047
749	669671.0810	1678657.6480	4048.29	OTC-531A-BLDGCOR	669476.9962	1678171.1376
750	669671.6690	1678686.6260	4048.54	OTC-531A-ELINE	669477.5840	1678200.1072
751	670995.2900	1691723.6540	4072.55	US/TC-500-STATION-6	670800.8214	1691233.3568
752	682707.7150	1693994.3080	4139.12	OTC-539-SEPTIC	682509.8519	1693503.3527
753	682707.1360	1693987.5070	4139.01	OTC-539-SEPTIC	682509.2731	1693496.5537
754	682713.9270	1693987.3840	4139.07	OTC-539-SEPTIC	682516.0621	1693496.4307
755	682714.4020	1693993.8490	4139.12	OTC-539-SEPTIC	682516.5370	1693502.8939
756	682710.5050	1693994.2530	4139.11	OTC-539-ELINE	682512.6411	1693503.2977
757	682711.7750	1694038.3560	4139.83	OTC-539-ELINE	682513.9107	1693547.3880
758	682709.6340	1694009.1330	4139.38	OTC-539-STATION-1	682511.7704	1693518.1734
759	682715.9010	1693990.7160	4139.12	OTC-539-STATION-2	682518.0355	1693499.7618
760	682707.9950	1693985.7400	4139.05	OTC-539-STATION-3	682510.1318	1693494.7872
761	682690.1540	1693966.7430	4138.58	OTC-539-STATION-4	682492.2960	1693475.7957
762	682700.5510	1693984.6270	4139.10	OTC-539-LEACH	682502.6900	1693493.6745
763	682694.7220	1693978.9800	4138.75	OTC-539-LEACH	682496.8627	1693488.0292
764	682685.8570	1693975.5370	4138.62	OTC-539-LEACH	682488.0002	1693484.5872
765	682686.8260	1693963.6500	4138.56	OTC-539-LEACH	682488.9690	1693472.7036
766	682690.9260	1693959.9730	4138.78	OTC-539-LEACH	682493.0678	1693469.0277
767	682696.9840	1693956.9410	4138.94	OTC-539-LEACH	682499.1240	1693465.9966
768	682705.4410	1693958.5980	4139.12	OTC-539-LEACH	682507.5786	1693467.6531
769	682714.7430	1693968.3290	4139.32	OTC-539-LEACH	682516.8779	1693477.3813
770	682721.4010	1693976.8710	4139.30	OTC-539-LEACH	682523.5339	1693485.9208
771	682717.7930	1693983.8070	4139.35	OTC-539-LEACH	682519.9270	1693492.8548
772	682710.1830	1693984.5790	4139.16	OTC-539-FLINE	682512.3192	1693493.6265
773	682710.2190	1693987.2160	4139.18	OTC-539-FLINE	682512.3552	1693496.2628
774	682690.6020	1694039.4720	4139.43	OTC-539-BLDGCOR	682492.7439	1693548.5036
775	682684.8200	1694045.5030	4139.27	OTC-539-BLDGCOR	682486.9635	1693554.5329
776	682741.4000	1694039.0240	4140.22	OTC-539-BLDGCOR	682543.5271	1693548.0558
777	682747.1830	1694045.0970	4140.68	OTC-539-BLDGCOR	682549.3085	1693554.1270

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7824
PROFESSIONAL SURVEYOR

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
778	686068.4560	1686694.7280	4103.68	OTC-534-MW-10-PVC	685869.6189	1686205.8883
779	686068.7800	1686694.7810	4104.06	OTC-534-MW-10-CASING	685869.9428	1686205.9413
780	685846.6180	1686522.2590	4102.52	OTC-534-MW-11-CASING	685647.8452	1686033.4693
781	685846.3620	1686522.2240	4102.15	OTC-534-MW-11-PVC	685647.5893	1686033.4343
782	685670.3280	1686561.9490	4102.29	OTC-534-MW-12-PVC	685471.6063	1686073.1478
783	685670.6410	1686561.9860	4102.69	OTC-534-MW-12-CASING	685471.9192	1686073.1848

RAW DATA

HOLLOMAN AIR FORCE BASE
WEST SITE

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	684793.2210	1611172.5300	3911.93	BASE	684598.9178	1610715.3759
2	682531.9480	1628747.6200	3965.57	EC-30	682338.2864	1628285.4792
3	682452.1330	1628714.0920	3957.20	EC-30-2	682258.4940	1628251.9607
4	698323.2620	1606321.3780	3915.08	CHAS	698125.1198	1605865.6004
5	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
60	616427.1730	1576921.6540	3941.67	LUCERO	616252.2680	1576474.2182
61	600657.7750	1576446.9260	4131.58	GERI	600487.3444	1575999.6249
62	614156.5210	1568701.1170	4227.09	SW 30	613982.2602	1568256.0137
63	575518.1130	1586543.7100	4038.20	BRYCE AZ MK	575354.8155	1586093.5441
64	576512.9440	1582067.6800	4357.70	BRYCE	576349.3642	1581618.7841
65	633185.2600	1566510.7280	4417.64	HORN	633005.6000	1566066.2462
66	580320.9040	1585783.2080	4128.59	NICK 2	580156.2437	1585333.2579
67	682452.1790	1628714.1810	3957.10	EC-30-2	682258.5400	1628252.0496
68	698323.2620	1606321.3780	3914.70	CHAS	698125.1198	1605865.6004
69	698212.0050	1609477.2870	3928.40	CHUCK	698013.8943	1609020.6139
70	682531.9020	1628747.5310	3965.57	EC-30	682338.2404	1628285.3902
71	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
100	684194.1900	1611160.8710	3912.56	USTC-518-NG	684000.0567	1610703.7202
101	684194.8810	1611165.7430	3912.33	USTC-518-NG	684000.7475	1610708.5908
102	684188.7970	1611168.5190	3912.27	USTC-518-NG	683994.6653	1610711.3660
103	684189.4230	1611176.5450	3912.53	USTC-518-NG	683995.2911	1610719.3898
104	684179.6480	1611178.5150	3912.57	USTC-518-NG	683985.5189	1610721.3592
105	684178.1630	1611171.1680	3912.37	USTC-518-NG	683984.0343	1610714.0143
106	684177.1790	1611163.0630	3913.00	USTC-518-NG	683983.0506	1610705.9116
107	684157.6940	1611173.6700	3912.42	USTC-518-STATION-5	683963.5711	1610716.5156
108	684176.2170	1611179.5100	3912.28	USTC-518-STATION-4	683982.0888	1610722.3539
109	684175.8730	1611172.3430	3912.51	USTC-518-STATION-2	683981.7449	1610715.1890
110	684173.8830	1611163.3430	3912.65	USTC-518-STATION-3	683979.7555	1610706.1915
111	684189.5770	1611170.0220	3912.30	USTC-518-STATION-1	683995.4450	1610712.8686
112	684160.3220	1611172.8640	3912.49	USTC-518-POTHOLE-1	683966.1984	1610715.7098
113	684125.1520	1611185.2360	3910.93	USTC-518-MW-1	683931.0383	1610728.0783
114	684130.9190	1611216.0540	3911.17	USTC-518-MW-2	683936.8037	1610758.8876
115	684158.8770	1611187.1610	3912.34	USTC-518-BLDGCORN-70	683964.7538	1610730.0028
116	684163.9700	1611180.4420	3912.46	USTC-518-BLDGCORN-70	683969.8453	1610723.2857
117	684211.6690	1611174.1790	3912.47	USTC-518-BLDGCORN-70	684017.5308	1610717.0244
118	684218.3800	1611179.3060	3912.45	USTC-518-BLDGCORN-70	684024.2399	1610722.1500
119	684236.0190	1611144.8000	3911.88	USTC-518-NAIL	684041.8739	1610687.6538
120	684242.7800	1611133.9130	3911.77	USTC-518-NAIL	684048.6330	1610676.7699
121	684203.7200	1611162.6570	3912.21	USTC-518-STATION-6	684009.5840	1610705.5057

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7924
PROFESSIONAL SURVEYOR

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-073

Appendix I
Laboratory Analytical Data and Data Validation Checklists

Note: The data validation checklists and laboratory analytical data reports are provided as separate files.

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-073

Appendix J
Waste Manifests

HAFB-001

Generator's Name	Generator's Address	Generator's Telephone No.
USAF	550 TABOSA AVE Holloman AFB NM 88330	575-491-8262

Origin of Special Waste (Project or Spill Location): ~~White Sands National Monument Park - Storage Lagoons~~ Holloman AFB NM Bldg # 55

Transporter #1 Company Name	Address	Telephone No.
Southwest Disposal	1350 LaVelle Road	575-434-1109
Transporter #2 Company Name	Address	Telephone No.
	Alamogordo, NM 88310	

Destination Facility Name/Site Address	Facility ID (Permit) Number	Telephone No.
Otero/Greentree Regional Landfill 24 Mls South of Alamogordo, Hwy 54	SWM-109102	575-439-4355

Type and Proper Name of Special Waste	Container(s) No.	Container(s) Type	Total Quantity	Unit Wt/Vol	
Non RCRA/Non Hazardous Substance ~~(Treatment Plant Lagoon Sludge)~~ (soil)		SD		6.95	Tons

Additional Descriptions for Special Waste Listed Above:

Site Contact: Todd Hiltunen 307-214-6080

Special Handling Instructions:

Southwest Disposal - Lined and Covered Roll-off

GENERATOR'S CERTIFICATION I hereby certify that the contents of this shipment are fully and accurately described above by type and proper name of the special waste, and that such waste has been managed, packaged, containerized and labeled in accordance with the requirements of 20.9.8 NMAC (Special Waste Requirements) in addition to any other applicable federal, state or local regulations.

Truck # 553 Bin #

Printed/Typed Name:	Signature:	Date:
Todd Hiltunen for Brent Hunt (CES)	for Brent Hunt (CES)	9/25/12

Transporter 1 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:
David Gurnbach		9/26/12

Transporter 2 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:

Discrepancy Indication Space:

Analytical supplied to landfill

no facility ID number

Facility Owner or Operator: ***I hereby acknowledge receipt of the special waste as indicated upon this manifest, except as noted above in the Discrepancy Indication Space.***

Printed/Typed Name:	Signature:	Date:
Darrell McGinnis / Attendant		9-26-12

~~Facility~~

OTERO/GREENTREE
REGIONAL LANDFILL

TRANSACTION: 28,080

CO. NAME:

ADDRESS: Environmental Waste Solutions
1348 B. Redtail Hawk Drive

CITY & STATE: Boardman, OH 44512

DATE: 9/26/12 TIME: 9:07 am

TRUCK NO.: 198

GROSS WEIGHT 47000

TARE WEIGHT: 33100

NET TONS: 13900 6.95

COST $: [redacted]

5% TAX $:

TOTAL DUE $:

WASTE: 5

WASTE DESC.: Construction Debris
H.A.F.B.

WASTE ORIGIN:

DRIVER

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-073

Appendix K
Geochemical Evaluation

Appendix K
Geochemical Evaluation of Arsenic in Soil at Building 1199 Septic Tank OT-C536, Holloman Air Force Base

This appendix provides the methodology and results of a geochemical evaluation of arsenic concentrations in soil samples from the Building 1199 Septic Tank OT-C536 location at Holloman Air Force Base (AFB). The 11 soil samples considered in this evaluation ("site" samples) were obtained in June 2012 at several depth intervals ranging from 0.0 to 2.0 feet (ft) to 28.0 to 30.0 ft below ground surface (bgs). All of the samples were analyzed for the full suite of 23 Target Analyte List metals. Arsenic is evaluated here because the New Mexico Environment Department soil screening level of 3.9 milligrams per kilogram (mg/kg) for arsenic was slightly exceeded in sample OTC536-IS-0009-062212 (10.0 to 12.0 ft bgs) which had a concentration of 4.2 mg/kg.

Analyses of 42 background subsurface samples were used for comparison in the evaluation. These background samples were obtained from depths of 7.0 to 30.0 ft bgs at intervals that were above the water table. Descriptions of the background samples can be found in the *Basewide Background Study for Holloman AFB* (Nation View-Bhate, 2009).

Evaluation Methodology

Trace element distributions in soil are often right-skewed and can span a wide range of concentrations. Trace element concentrations can naturally exceed risk-based screening levels because these screening levels do not consider natural site-specific distributions of trace element concentrations.

Comparisons of concentrations in site samples to background screening values can also be problematic. The background screening values used here are based on the 95th upper tolerance limits of background distributions. By definition, one would expect that five percent, or one in 20 samples will on average exceed the background screening value even if no contamination is present.

Comparisons to risk-based screening levels and background screening values only consider the absolute concentrations of individual elements, and disregard the interdependence of element concentrations and the geochemical mechanisms controlling

element behavior. However, it is well established that trace elements naturally associate with specific minerals in soil and sediment, and the preferential enrichment of a sample with these minerals will result in naturally elevated trace element concentrations. It is thus important to be able to identify these naturally high concentrations and distinguish them from potential contamination.

Recent publications indicate that geochemical evaluations are assuming a larger role in environmental investigations (e.g., EPA, 1995; Barclift, *et al*., 2000; U.S. Navy, 2002, 2003; Myers and Thorbjornsen, 2004; Thorbjornsen and Myers, 2007a, 2007b, 2008). A properly executed geochemical evaluation can distinguish between naturally high element concentrations versus contamination, and can identify the specific samples that may contain some component of site-related contamination.

Geochemical Evaluation Methodology for Soil. Trace elements naturally associate with specific soil-forming minerals, and geochemical evaluations are predicated on these known associations. For example, in most uncontaminated oxic soils, arsenic exhibits an association with iron oxide minerals. Arsenic exists in oxic soil pore fluid as oxyanions such as $HAsO_4^{-2}$ and $H_2AsO_4^{-}$ (Brookins, 1988), and these negatively charged species have a strong affinity to adsorb on iron oxides, which tend to maintain a net positive surface charge (Electric Power Research Institute, 1984). (In this report, the term "iron oxide" encompasses oxides, hydroxides, oxyhydroxides, and hydrous oxides of iron.) This association is expressed as a positive correlation between arsenic concentrations and iron concentrations for uncontaminated samples.

As a result of these associations, soil samples with a low percentage of iron oxides will contain proportionally lower arsenic concentrations, and soil samples that are enriched in iron oxides will contain proportionally higher arsenic concentrations (Bowell, 1994). Although there is variability in the absolute concentrations of arsenic and iron in soil at a site, the arsenic/iron (As/Fe) ratios of the samples will be relatively constant if no contamination is present (Myers and Thorbjornsen, 2004). Samples that contain excess arsenic from a contaminant source (herbicides, treated wood, etc.) will exhibit anomalously high As/Fe ratios compared to the uncontaminated samples.

The reference elements against which trace elements are evaluated reflect the affinities that the trace elements have for specific minerals, which is a function of the specific geochemical environment. The concentrations of iron and aluminum serve as qualitative

indicators of the amounts of iron oxide and clay minerals that are present in the soil samples (all clay minerals contain aluminum as a major component). Along with arsenic, selenium and vanadium are present in oxic soil pore fluid as anions and have an affinity to adsorb on iron oxides, which tend to maintain a net positive surface charge. Concentrations of arsenic, selenium, or vanadium in a set of samples can be evaluated through comparison to the corresponding iron concentrations. Barium, cobalt, cadmium, lead, and zinc are typically present in soil as divalent cations and have an affinity to adsorb on clay minerals, which tend to maintain a net negative surface charge. Concentrations of these elements can be evaluated through comparison to the corresponding aluminum concentrations.

To perform the geochemical evaluation, correlation plots are constructed to explore the elemental associations and identify potentially contaminated samples. The detected concentrations of the trace element of interest (dependent variable) are plotted against the detected concentrations of the reference element (independent variable), which represents the mineral to which the trace element may be adsorbed. In the case of arsenic, the arsenic concentrations for a given set of samples would be plotted on the y-axis and the corresponding iron concentrations would be plotted on the x-axis.

If no contamination is present, then the samples will exhibit a common trend with a positive slope, and the samples with the highest trace element concentrations will fall on this trend. This indicates that the elevated trace element concentrations are due to the preferential enrichment of the minerals represented by the reference element concentrations in those samples, and that the trace element has a natural source. If, however, the samples with high trace element concentrations have low or moderate reference element concentrations, then those samples will lie above the trend established by the other samples. This indicates that the anomalous samples contain excess trace elements beyond that which can be explained by the natural reference element content, and such samples may contain a component of contamination.

Site samples with a trace element present as a contaminant will exhibit anomalously high trace-versus-major element ratios compared to background trace-versus-major element ratios. These elevated ratios may not always be apparent in log-log correlation plots, especially at the upper end of the concentration range. Therefore, ratio plots—which depict trace element concentrations on the y-axis and trace/reference element ratios on the x-axis—are employed in conjunction with correlation plots in those cases where it is

not immediately apparent which site samples have anomalously high elemental ratios on the correlation plots. Ratio plots have high resolution over the entire concentration range and permit easy visual identification of samples with anomalously high elemental ratios relative to background.

It is important to note that there is natural variability, as well as analytical uncertainty, in the element ratios of uncontaminated soil samples. Trace/reference element ratios are calculated from two uncertain analytical results, so the resulting uncertainties in the ratios can produce some scatter in the points on a ratio plot. This is especially true when estimated ("J"-qualified) analytical results are used. This can be seen on some of the plots that show more scatter of the points at the lower end of the concentration range, where analytical uncertainties are higher and analytical results are reported with fewer significant figures.

Evaluation Results

Aluminum and iron are evaluated first to verify that the iron concentrations are natural and that they are therefore suitable for use as reference elements for the evaluation of arsenic.

Aluminum and Iron – Aluminum has a mean concentration of 6,300 mg/kg in the 11 site samples. Aluminum is a primary component of common soil-forming minerals such as clays, feldspars, and micas. Aluminum is always trivalent (as Al^{3+}) and can substitute for ferric iron (Fe^{3+}) in iron oxide minerals. It can also adsorb on iron oxide surfaces (Cornell and Schwertmann, 2003).

Iron has a mean concentration of 6,000 mg/kg in the site samples, and is dominantly present as iron oxides. Iron oxides are common soil-forming minerals and occur as discrete mineral grains or as coatings on silicate minerals (Cornell and Schwertmann, 2003).

Clays and iron oxides tend to exist as very fine particles, so both aluminum (a proxy for clay content) and iron (a proxy for iron oxide content) are enriched in samples with finer grain sizes. A plot of iron versus aluminum concentrations can be used to qualitatively assess the relative abundance of these minerals in site soil, as shown in Figure 1. The 11 site samples are represented by circles, and the 42 subsurface background soil samples are represented by triangles in the figure. The site and background samples fall on the

same trend in the plot, indicating that all of the samples have similar iron/aluminum (Fe/Al) ratios.

These Fe/Al ratios can be seen more clearly on Figure 2, which shows iron concentrations versus Fe/Al ratios for each sample. The fact that the site and background samples have ratios that fall well within one order of magnitude indicates that the site samples do not contain excess aluminum or iron from a contaminant source and that their aluminum and iron concentrations are natural.

Iron is used as the reference element for arsenic so these results also indicate that the observed iron concentrations are suitable for use in evaluating the arsenic source in the site samples. As discussed previously, clays and iron oxides have an affinity to adsorb specific trace elements, so samples that are enriched in these minerals are expected to contain naturally high concentrations of trace elements, including arsenic. These are the samples that lie on the upper end of the trend in Figure 1.

Arsenic – Arsenic is known to associate with iron oxide minerals as discussed above. A soil sample that is naturally enriched in iron oxides is expected to be naturally enriched in arsenic. Figure 3 provides a plot of detected arsenic versus iron concentrations in the site and background samples. The site and background samples fall on the same trend, although this trend is less correlated than the iron versus aluminum trend shown in Figure 1. Five of the 11 site samples have nondetectable arsenic (as do ten of the 42 background samples), and five site samples have estimated ("J"-flagged) results that are below their reporting limits. Estimated results usually show less correlation on the plots because the true locations of the points are uncertain.

Figure 4 provides a ratio plot of the same arsenic and iron results. This perspective reveals that the site samples have As/Fe ratios that fall within the range of the background ratios. There is more spread in the ratios at lower arsenic concentrations, which is likely due to the estimated nature of the analytical results at lower concentrations. However, the consistent As/Fe ratios in the site samples, and the agreement with the background ratios indicates that the observed arsenic concentrations are most likely natural.

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U.S. Navy, 2002, ***Guidance for Environmental Background Analysis, Volume 1: Soil***, NFESC User's Guide UG-2049-ENV, Naval Facilities Engineering Command, Washington, D.C., April.

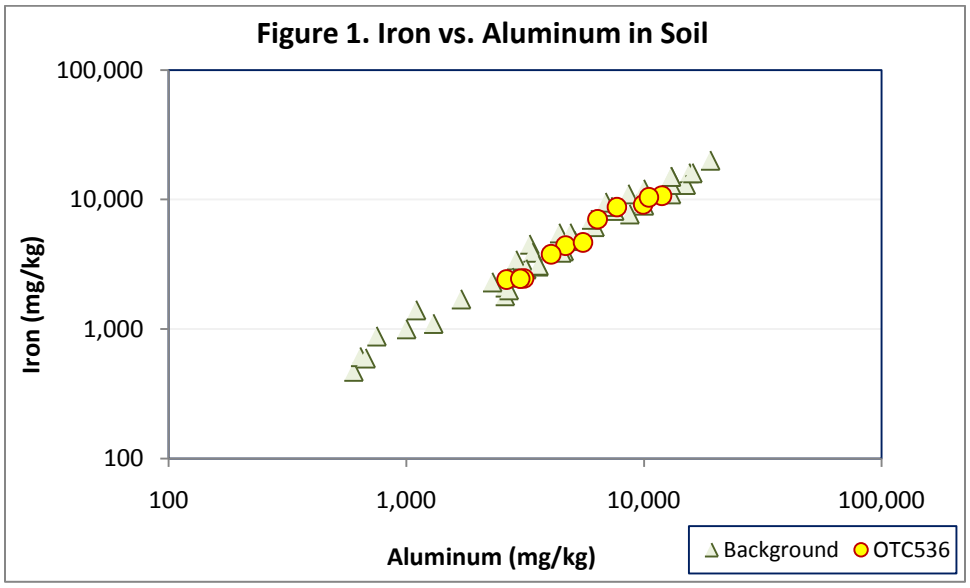
Figure 1. Iron vs. Aluminum in Soil
100,000
10,000
1,000
100
Iron (mg/kg)
100
1,000
10,000
100,000
Aluminum (mg/kg)
Background
OTC536

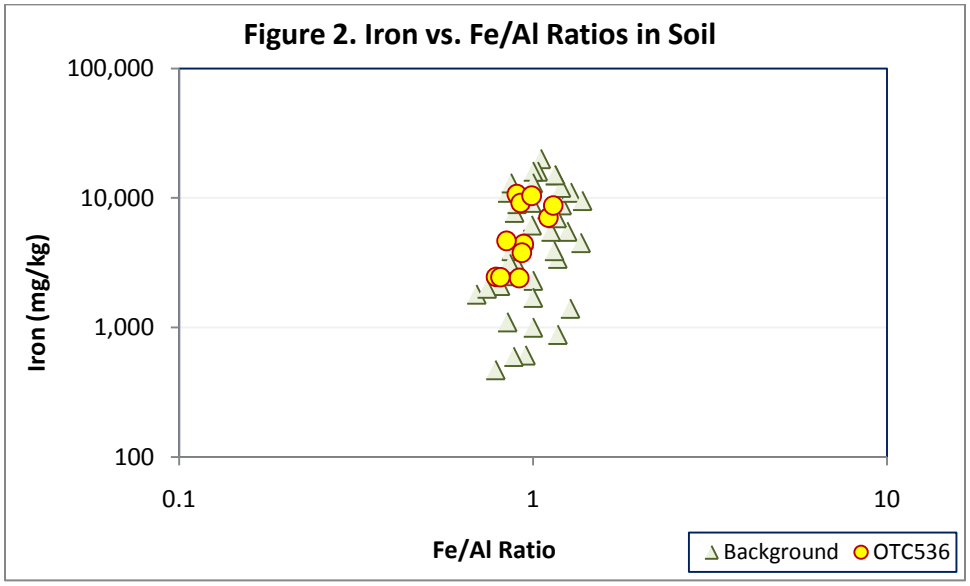
Figure 2. Iron vs. Fe/Al Ratios in Soil
100,000
10,000
1,000
100
Iron (mg/kg)
0.1
1
10
Fe/Al Ratio
Background
OTC536

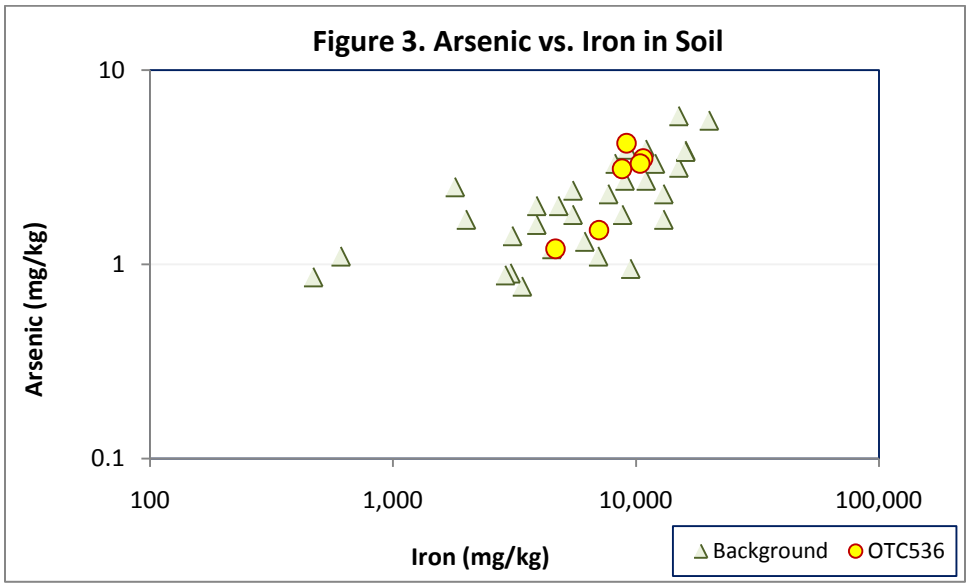
Figure 3. Arsenic vs. Iron in Soil
10
1
0.1
Arsenic (mg/kg)
100
1,000
10,000
100,000
Iron (mg/kg)
Background
OTC536

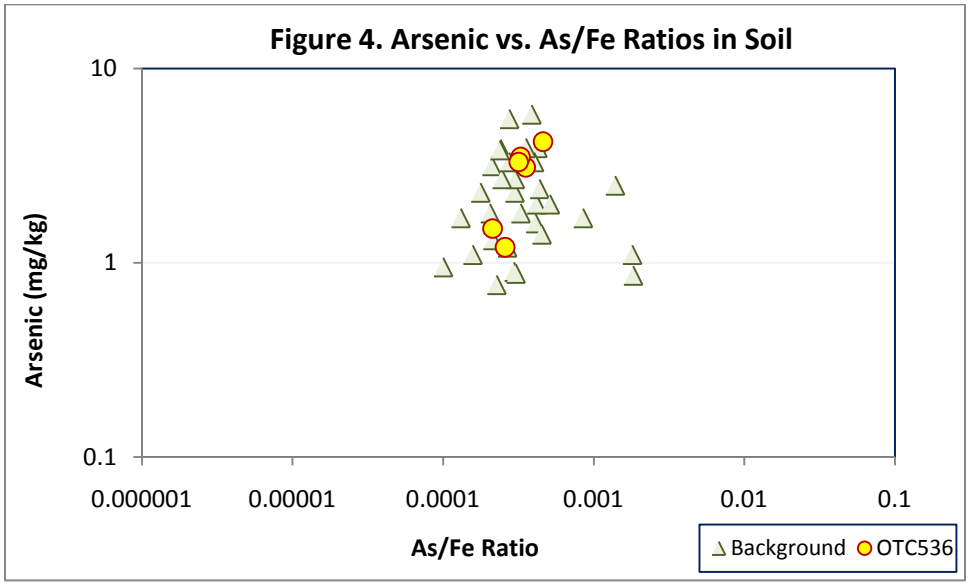
Figure 4. Arsenic vs. As/Fe Ratios in Soil
10
1
0.1
Arsenic (mg/kg)
0.000001
0.00001
0.0001
0.001
0.01
0.1
As/Fe Ratio
Background
OTC536

Appendix L
Risk Evaluation Calculations

Risk Additivity
Soil Analytical Data
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC536-IS-0001-062112		OTC536-IS-0002-062112		OTC536-IS-0003-062212		OTC536-IS-0004-062212-FD		OTC536-IS-0005-062212		OTC536-IS-0006-062212		OTC536-IS-0007-062212		OTC536-IS-0008-062212		OTC536-IS-0009-062212		OTC536-IS-0010-062212		OTC536-IS-0011-062212	
				Sample Date	6/21/2012		6/21/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		28 - 30	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**81.9**		**83.7**		**81.5**		**84.3**		**90.1**		**84.4**		**82.4**		**85.9**		**85.3**		**84**		**75.2**	
VOLATILES (mg/kg)																										
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0015	U	0.00093	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00089	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0016	U	0.001	U	0.0012	U	0.0013	U	0.0013	U	0.0013	U	0.0011	U	0.0013	U	0.0012	U	0.0012	U	0.00097	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0023	U	0.0014	U	0.0017	U	0.0018	U	0.0019	U	0.0018	U	0.0016	U	0.0018	U	0.0017	U	0.0017	U	0.0014	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0015	U	0.00093	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00089	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0015	U	0.00093	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00089	U
1,1-DICHLOROETHENE	NE	240	449		0.0019	U	0.0012	U	0.0014	U	0.0015	U	0.0016	U	0.0015	U	0.0013	U	0.0015	U	0.0014	U	0.0014	U	0.0011	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0016	U	0.001	U	0.0012	U	0.0013	U	0.0013	U	0.0013	U	0.0011	U	0.0013	U	0.0012	U	0.0012	U	0.00097	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0031	U	0.002	U	0.0023	U	0.0024	U	0.0026	U	0.0025	U	0.0022	U	0.0024	U	0.0023	U	0.0024	U	0.0019	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.0013	U	0.00085	U	0.00098	U	0.0011	U	0.0011	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00081	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0015	U	0.00093	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00089	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.0013	U	0.00085	U	0.00098	U	0.0011	U	0.0011	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00081	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0016	U	0.001	U	0.0012	U	0.0013	U	0.0013	U	0.0013	U	0.0011	U	0.0013	U	0.0012	U	0.0012	U	0.00097	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0016	U	0.001	U	0.0012	U	0.0013	U	0.0013	U	0.0013	U	0.0011	U	0.0013	U	0.0012	U	0.0012	U	0.00097	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0015	U	0.00093	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00089	U
2-HEXANONE	NE	210	NE		0.0073	U	0.0046	U	0.0053	U	0.0057	U	0.0061	U	0.0058	U	0.0052	U	0.0057	U	0.0055	U	0.0055	U	0.0044	U
ACETONE	NE	61000	66600		0.027	U	0.017	U	0.02	U	0.021	U	0.022	U	0.022	U	0.019	U	0.021	U	0.02	U	0.02	U	0.016	U
BENZENE	NE	1.1	15.4		0.002	U	0.0013	U	0.0015	U	0.0016	U	0.0017	U	0.0016	U	0.0014	U	0.0016	U	0.0015	U	0.0015	U	0.0012	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0015	U	0.00093	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00089	U
BROMOFORM	NE	62	616		0.002	U	0.0013	U	0.0015	U	0.0016	U	0.0017	U	0.0016	U	0.0014	U	0.0016	U	0.0015	U	0.0015	U	0.0012	U
BROMOMETHANE	NE	7.3	16.5		0.0027	U	0.0017	U	0.002	U	0.0021	U	0.0022	U	0.0022	U	0.0019	U	0.0021	U	0.002	U	0.002	U	0.0016	U
CARBON DISULFIDE	NE	820	1530		0.0027	U	0.0017	U	0.002	U	0.0021	U	0.0022	U	0.0022	U	0.0019	U	0.0021	U	0.002	U	0.002	U	0.0016	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0024	U	0.0015	U	0.0018	U	0.0019	U	0.002	U	0.0019	U	0.0017	U	0.0019	U	0.0018	U	0.0018	U	0.0015	U
CHLOROBENZENE	NE	290	376		0.0013	U	0.00085	U	0.00098	U	0.0011	U	0.0011	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00081	U
CHLOROETHANE	NE	15000	29800		0.0027	U	0.0017	U	0.002	U	0.0021	U	0.0022	U	0.0022	U	0.0019	U	0.0021	U	0.002	U	0.002	U	0.0016	U
CHLOROFORM	NE	0.29	5.86		0.0016	U	0.001	U	0.0012	U	0.0013	U	0.0013	U	0.0013	U	0.0011	U	0.0013	U	0.0012	U	0.0012	U	0.00097	U
CHLOROMETHANE	NE	120	275		0.0027	U	0.0017	U	0.002	U	0.0021	U	0.0022	U	0.0022	U	0.0019	U	0.0021	U	0.002	U	0.002	U	0.0016	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.002	U	0.0013	U	0.0015	U	0.0016	U	0.0017	U	0.0016	U	0.0014	U	0.0016	U	0.0015	U	0.0015	U	0.0012	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0013	U	0.00085	U	0.00098	U	0.0011	U	0.0011	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00081	U
CYCLOHEXANE	NE	7000	NE		0.0019	U	0.0012	U	0.0014	U	0.0015	U	0.0016	U	0.0015	U	0.0013	U	0.0015	U	0.0014	U	0.0014	U	0.0011	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.0013	U	0.00085	U	0.00098	U	0.0011	U	0.0011	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00081	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.002	U	0.0013	U	0.0015	U	0.0016	U	0.0017	U	0.0016	U	0.0014	U	0.0016	U	0.0015	U	0.0015	U	0.0012	U
ETHYLBENZENE	NE	5.4	68.4		0.0013	U	0.00085	U	0.00098	U	0.0011	U	0.0011	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00081	U
ISOPROPYLBENZENE	NE	2100	2430		0.0015	U	0.00093	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00089	U
METHYL ACETATE	NE	78000	78200		0.017	U	0.011	U	0.012	U	0.013	U	0.014	U	0.014	U	0.012	U	0.013	U	0.013	U	0.013	U	0.01	U
METHYL ETHYL KETONE	NE	28000	37100		0.0082	R	0.0052	R	0.006	U	0.0064	U	0.0069	U	0.0066	U	0.0058	U	0.0064	U	0.0062	U	0.0062	U	0.0049	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0074	U	0.0047	U	0.0054	U	0.0058	U	0.0062	U	0.006	U	0.0053	U	0.0058	U	0.0056	U	0.0056	U	0.0045	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0017	U	0.0011	U	0.0013	U	0.0014	U	0.0015	U	0.0014	U	0.0012	U	0.0014	U	0.0013	U	0.0013	U	0.0011	U
METHYLENE CHLORIDE	NE	56	409		0.0062	U	**0.0039**	J	0.0045	U	0.0049	U	0.0052	U	0.005	U	0.0044	U	0.0048	U	0.0047	U	0.0047	U	0.0037	U

Risk Additivity
Soil Analytical Data
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC536-IS-0001-062112		OTC536-IS-0002-062112		OTC536-IS-0003-062212		OTC536-IS-0004-062212-FD		OTC536-IS-0005-062212		OTC536-IS-0006-062212		OTC536-IS-0007-062212		OTC536-IS-0008-062212		OTC536-IS-0009-062212		OTC536-IS-0010-062212		OTC536-IS-0011-062212	
				Sample Date	6/21/2012		6/21/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		28 - 30	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																										
STYRENE	NE	6300	7280		0.0035	U	0.0022	U	0.0026	U	0.0027	U	0.0029	U	0.0028	U	0.0025	U	0.0027	U	0.0026	U	0.0027	U	0.0021	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0027	U	0.0017	U	0.002	U	0.0021	U	0.0022	U	0.0022	U	0.0019	U	0.0021	U	0.002	U	0.002	U	0.0016	U
TETRACHLOROETHYLENE	NE	22	7.02		0.0013	U	0.00085	U	0.00098	U	0.0011	U	0.0011	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00081	U
TOLUENE	NE	5000	5270		0.0016	U	0.001	U	0.0012	U	0.0013	U	0.0013	U	0.0013	U	0.0011	U	0.0013	U	0.0012	U	0.0012	U	0.00097	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.002	U	0.0013	U	0.0015	U	0.0016	U	0.0017	U	0.0016	U	0.0014	U	0.0016	U	0.0015	U	0.0015	U	0.0012	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0015	U	0.00093	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00089	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0016	U	0.001	U	0.0012	U	0.0013	U	0.0013	U	0.0013	U	0.0011	U	0.0013	U	0.0012	U	0.0012	U	0.00097	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0027	U	0.0017	U	0.002	U	0.0021	U	0.0022	U	0.0022	U	0.0019	U	0.0021	U	0.002	U	0.002	U	0.0016	U
VINYL CHLORIDE	NE	0.06	0.728		0.002	U	0.0013	U	0.0015	U	0.0016	U	0.0017	U	0.0016	U	0.0014	U	0.0016	U	0.0015	U	0.0015	U	0.0012	U
XYLENES, TOTAL	NE	630	814		0.0043	U	0.0027	U	0.0031	U	0.0034	U	0.0036	U	0.0035	U	0.0031	U	0.0034	U	0.0032	U	0.0033	U	0.0026	U
SEMIVOLATILES (mg/kg)																										
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
2,4-DICHLOROPHENOL	NE	180	183		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.025	U	0.025	U	0.026	U	0.025	U	0.024	U	0.025	U	0.025	U	0.025	U	0.025	U	0.025	U	0.028	U
2,4-DINITROPHENOL	NE	120	122		0.4	U	0.4	U	0.41	U	0.4	U	0.38	U	0.4	U	0.4	U	0.39	U	0.39	U	0.39	U	0.44	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
2,6-DINITROTOLUENE	NE	61	61.1		0.024	U	0.023	U	0.024	U	0.023	U	0.022	U	0.024	U	0.024	U	0.023	U	0.023	U	0.023	U	0.026	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.04	U	0.039	U	0.039	U	0.039	U	0.044	U
2-CHLOROPHENOL	NE	390	391		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
2-METHYLNAPHTHALENE	NE	230	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
2-METHYLPHENOL	NE	3100	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
2-NITROANILINE	NE	610	NE		0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.04	U	0.039	U	0.039	U	0.039	U	0.044	U
2-NITROPHENOL	NE	NE	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.04	U	0.039	U	0.039	U	0.039	U	0.044	U
3-NITROANILINE	NE	NE	NE		0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.04	U	0.039	U	0.039	U	0.039	U	0.044	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.081	U	0.08	U	0.081	U	0.08	U	0.075	U	0.08	U	0.081	U	0.079	U	0.079	U	0.078	U	0.089	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
4-CHLOROANILINE	NE	2.4	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
4-NITROANILINE	NE	24	NE		0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.04	U	0.039	U	0.039	U	0.039	U	0.044	U
4-NITROPHENOL	NE	NE	NE		0.16	UJ	0.16	U	0.16	U	0.16	U	0.15	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.18	U
ACENAPHTHENE	NE	3400	3440		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
ACENAPHTHYLENE	NE	NE	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
ACETOPHENONE	NE	7800	7820		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
ANTHRACENE	NE	17000	17200		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
ATRAZINE	NE	2.1	NE		0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U

Risk Additivity
Soil Analytical Data
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Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC536-IS-0001-062112		OTC536-IS-0002-062112		OTC536-IS-0003-062212		OTC536-IS-0004-062212-FD		OTC536-IS-0005-062212		OTC536-IS-0006-062212		OTC536-IS-0007-062212		OTC536-IS-0008-062212		OTC536-IS-0009-062212		OTC536-IS-0010-062212		OTC536-IS-0011-062212	
				Sample Date	6/21/2012		6/21/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		28 - 30	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																										
BENZALDEHYDE	NE	7800	NE	0.2	U	0.2	U	0.2	U	0.2	U	0.19	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.22	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
BENZO(A)PYRENE	NE	0.015	0.148	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.04	U	0.039	U	0.039	U	0.039	U	0.044	U
BIPHENYL	NE	51	57.1	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.081	U	0.08	U	0.081	U	0.08	U	0.075	U	0.08	U	0.081	U	0.079	U	0.079	U	0.078	U	0.089	U
CAPROLACTAM	NE	31000	NE	0.064	U	0.064	U	0.065	U	0.064	U	0.06	U	0.064	U	0.065	U	0.063	U	0.063	U	0.062	U	0.071	U
CARBAZOLE	NE	NE	NE	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
CHRYSENE	NE	15	148	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
DIBENZOFURAN	NE	78	NE	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
DIETHYL PHTHALATE	NE	49000	48900	0.081	U	0.08	U	0.081	U	0.08	U	0.075	U	0.08	U	0.081	U	0.079	U	0.079	U	0.078	U	0.089	U
DIMETHYL PHTHALATE	NE	611000	611000	0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.2	U	0.039	U	0.039	U	0.039	U	0.044	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.081	U	0.08	U	0.081	U	0.08	U	0.075	U	0.08	U	0.02	U	0.079	U	0.079	U	0.078	U	0.089	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.02	U	0.039	U	0.039	U	0.039	U	0.044	U
FLUORANTHENE	NE	2300	2290	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
FLUORENE	NE	2300	2290	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.04	U	0.039	U	0.039	U	0.039	U	0.044	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.089	U	0.088	U	0.089	U	0.088	U	0.083	U	0.088	U	0.02	U	0.087	U	0.087	U	0.086	U	0.098	U
HEXACHLOROETHANE	NE	12	42.8	0.04	U	0.04	U	0.041	U	0.04	U	0.038	U	0.04	U	0.02	U	0.039	U	0.039	U	0.039	U	0.044	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
ISOPHORONE	NE	510	5120	0.02	UJ	0.02	UJ	0.02	U	0.02	U	0.019	U	0.02	UJ	0.081	U	0.02	U	0.02	U	0.02	U	0.022	U
M,P-CRESOL	NE	NE	NE	0.029	U	0.029	U	0.029	U	0.029	U	0.027	U	0.029	U	0.065	U	0.028	U	0.028	U	0.028	U	0.032	U
NAPHTHALENE	NE	3.6	43.0	0.032	U	0.032	U	0.033	U	0.032	U	0.03	U	0.032	U	0.02	U	0.031	U	0.031	U	0.031	U	0.036	U
NITROBENZENE	NE	4.8	53.5	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.24	U	0.24	U	0.24	U	0.24	U	0.23	U	0.24	U	0.081	U	0.24	U	0.24	U	0.23	U	0.27	U
PHENANTHRENE	NE	1830	1830	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
PHENOL	NE	18000	18300	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U
PYRENE	NE	1700	1720	0.02	U	0.02	U	0.02	U	0.02	U	0.019	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.022	U

Risk Additivity
Soil Analytical Data
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC536-IS-0001-062112		OTC536-IS-0002-062112		OTC536-IS-0003-062212		OTC536-IS-0004-062212-FD		OTC536-IS-0005-062212		OTC536-IS-0006-062212		OTC536-IS-0007-062212		OTC536-IS-0008-062212		OTC536-IS-0009-062212		OTC536-IS-0010-062212		OTC536-IS-0011-062212	
				Sample Date		6/21/2012		6/21/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012	
				Location		Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)		3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		28 - 30	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																											
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.074	U	0.075	U	0.069	U	0.073	U	0.066	U	0.067	U	0.057	U	0.068	U	0.061	U	0.078	U	0.07	U		
1,3-DINITROBENZENE	NE	6.10	NE	0.074	U	0.075	U	0.069	U	0.073	U	0.066	U	0.067	U	0.057	U	0.068	U	0.061	U	0.078	U	0.07	U		
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.074	U	0.075	U	0.069	U	0.073	U	0.066	U	0.067	U	0.057	U	0.068	U	0.061	U	0.078	U	0.07	U		
2,4-DINITROTOLUENE	NE	1.60	15.7	0.089	U	0.091	U	0.084	U	0.088	U	0.08	U	0.081	U	0.069	U	0.083	U	0.074	U	0.094	U	0.085	U		
2,6-DINITROTOLUENE	NE	61.0	61.1	0.08	U	0.082	U	0.075	U	0.079	U	0.072	U	0.072	U	0.062	U	0.074	U	0.067	U	0.084	U	0.076	U		
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.074	U	0.075	U	0.069	U	0.073	U	0.066	U	0.067	U	0.057	U	0.068	U	0.061	U	0.078	U	0.07	U		
2-NITROTOLUENE	NE	2.90	29.1	0.074	U	0.075	U	0.069	U	0.073	U	0.066	U	0.067	U	0.057	U	0.068	U	0.061	U	0.078	U	0.07	U		
3-NITROTOLUENE	NE	6.10	7.82	0.074	U	0.075	U	0.069	U	0.073	U	0.066	U	0.067	U	0.057	U	0.068	U	0.061	U	0.078	U	0.07	U		
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.074	U	0.075	U	0.069	U	0.073	U	0.066	U	0.067	U	0.057	U	0.068	U	0.061	U	0.078	U	0.07	U		
4-NITROTOLUENE	NE	30.0	244.4	0.093	U	0.095	U	0.087	U	0.092	U	0.084	U	0.084	U	0.072	U	0.086	U	0.077	U	0.098	U	0.089	U		
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.18	U	0.19	U	0.17	U	0.18	U	0.17	U	0.17	U	0.14	U	0.17	U	0.15	U	0.19	U	0.18	U		
NITROBENZENE	NE	4.80	53.5	0.086	U	0.087	U	0.081	U	0.085	U	0.077	U	0.077	U	0.066	U	0.079	U	0.071	U	0.09	U	0.082	U		
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.074	U	0.075	U	0.069	U	0.073	U	0.066	U	0.067	U	0.057	U	0.068	U	0.061	U	0.078	U	0.07	U		
TETRYL	NE	240.0	244.0	0.074	U	0.075	U	0.069	U	0.073	U	0.066	U	0.067	U	0.057	U	0.068	U	0.061	U	0.078	U	0.07	U		
METALS (mg/kg)																											
ALUMINUM	13722	77000	78000	**3130**		**6380**		**4680**		**4070**		**7690**		**2640**	J	**11900**		**5540**		**9920**		**3020**		**10500**			
ANTIMONY	1.6	31	31.3	1.2	U	1	U	1.6	U	1.6	U	0.99	U	0.99	UJ	1.1	U	1	U	1.6	U	0.9	U	**1.4**	J		
ARSENIC	3.7	0.39	3.90	1.2	U	**1.5**	J	0.8	U	0.78	U	**3.1**	J	0.99	U	**3.5**	J	**1.2**	J	**4.2**		0.9	U	**3.3**	J		
BARIUM	169.3	15000	15600	**42.9**	J	**84.2**	J	**72.8**	J	**38.6**	J	**81**	J	**26.1**	J	**106**	J	**47.1**	J	**97.1**		**36.2**	J	**57.3**	J		
BERYLLIUM	1.6	160	156	0.58	U	0.52	U	0.4	U	0.39	U	0.5	U	0.49	U	**0.72**	J	0.52	U	**0.54**	J	0.45	U	0.51	U		
CADMIUM	0.3	70	70.3	0.58	U	0.52	U	0.8	U	0.78	U	0.5	U	0.49	UJ	0.55	U	0.52	U	0.8	U	0.45	U	0.51	U		
CALCIUM	317332	NE	NE	**208000**		**199000**		**260000**		**219000**		**123000**		**222000**	J	**227000**		**202000**		**209000**		**211000**		**260000**			
CHROMIUM[d]	25	117000	117000	**2.5**	J	**6.4**		**4.2**	J	**4.2**	J	**11.2**		**2.2**	J	**12.8**		**4.8**	J	**9.6**		**2.5**	J	**12.7**			
COBALT	7.7	23	NE	**1.3**	J	**2**	J	**1.5**	J	**1.3**	J	**3.6**	J	**0.9**	J	**4.4**	J	**1.8**	J	**3.7**	J	**1.2**	J	**5.7**	J		
COPPER	13	3100	3130	**2.2**	J	**3.1**	J	**2**	J	**1.9**	J	**6.4**	J	**1.2**	J	**7**	J	**2.8**	J	**6.3**	J	**2.1**	J	**11.3**	J		
IRON	23049	55000	54800	**2460**		**7050**		**4400**		**3780**		**8760**		**2410**		**10700**		**4660**		**9140**		**2440**		**10400**			
LEAD	10.9	400	400	**0.78**	J	**2.9**	J	**2**	J	0.78	U	**4.5**	J	**1**	J	**7.1**	J	**4**	J	**3.8**	J	**2**	J	**9.3**	J		
MAGNESIUM	16991	NE	NE	**3480**		**3750**		**2850**		**2310**		**4720**		**1680**	J	**18600**		**3690**		**8230**		**3480**		**10000**			
MANGANESE	393	1800	1860	**47.5**		**141**		**99.9**		**61.4**		**140**		**31.7**		**88.4**		**82.9**		**170**		**47.2**		**391**			
MERCURY	0.0108	10	15.6	0.0091	U	0.0091	U	0.0094	U	0.0096	U	0.0087	U	0.0094	U	0.0098	U	0.0092	U	0.009	U	0.0094	U	0.011	U		
NICKEL	17.4	1500	1560	**2.5**	J	**5.6**	J	**3.4**	J	**3**	J	**7.6**	J	**1.9**	J	**11.8**	J	**4**	J	**10.4**	J	**2.8**	J	**11.9**	J		
POTASSIUM	5077	NE	NE	**1080**	J	**1640**	J	**1200**	J	**1080**	J	**1880**	J	**703**	J	**2680**	J	**1500**	J	**2330**	J	**971**	J	**2990**	J		
SELENIUM	1.4	390	391	2.3	U	2.1	U	3.2	U	3.1	U	2	U	2	U	2.2	U	2.1	U	3.2	U	1.8	U	2	U		
SILVER	1.1	390	391	0.58	U	0.52	U	0.4	U	0.39	U	0.5	U	0.49	U	0.55	U	0.52	U	0.4	U	0.45	U	0.51	U		
SODIUM	5196	NE	NE	**856**	J	580	U	440	U	430	U	**655**	J	540	U	610	U	570	U	440	U	**655**	J	560	U		
THALLIUM	1.3	0.78	0.782	1.5	U	1.4	U	2.1	U	2	U	1.3	U	1.3	U	1.4	U	1.3	U	2.1	U	1.2	U	1.3	U		
VANADIUM	42.6	390	391	**9.2**	J	**16.2**	J	**9.5**	J	**7.3**	J	**21.9**	J	**5.3**	J	**24**	J	**11.8**	J	**23.9**		**8.3**	J	**21.8**	J		
ZINC	54.6	23000	23500	**7.5**	J	**13.8**		**7.2**	J	**7.9**	J	**20.6**		**6.2**	J	**26.5**		**15.1**		**21.1**		**6.9**	J	**36.8**			

Risk Additivity
Soil Analytical Data
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC536-IS-0001-062112		OTC536-IS-0002-062112		OTC536-IS-0003-062212		OTC536-IS-0004-062212-FD		OTC536-IS-0005-062212		OTC536-IS-0006-062212		OTC536-IS-0007-062212		OTC536-IS-0008-062212		OTC536-IS-0009-062212		OTC536-IS-0010-062212		OTC536-IS-0011-062212	
				Sample Date	6/21/2012		6/21/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		28 - 30	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																										
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0082	U	0.008	U	0.0081	U	0.0079	U	0.0073	U	0.0079	U	0.0081	U	0.0077	U	0.0077	U	0.0079	U	0.0088	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.01	U	0.01	U	0.01	U	0.0099	U	0.0092	U	0.0099	U	0.01	U	0.0097	U	0.0096	U	0.0099	U	0.011	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.01	U	0.01	U	0.01	U	0.0099	U	0.0092	U	0.0099	U	0.01	U	0.0097	U	0.0096	U	0.0099	U	0.011	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0082	U	0.008	U	0.0081	U	0.0079	U	0.0073	U	0.0079	U	0.0081	U	0.0077	U	0.0077	U	0.0079	U	0.0088	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0082	U	0.008	U	0.0081	U	0.0079	U	0.0073	U	0.0079	U	0.0081	U	0.0077	U	0.0077	U	0.0079	U	0.0088	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0082	U	0.008	U	0.0081	U	0.0079	U	0.0073	U	0.0079	U	0.0081	U	0.0077	U	0.0077	U	0.0079	U	0.0088	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0082	U	0.008	U	0.0081	U	0.0079	U	0.0073	U	0.0079	U	0.0081	U	0.0077	U	0.0077	U	0.0079	U	0.0088	U
PETROLEUM HYDROCARBONS (mg/kg)																										
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	3.5	U	3	U	3.4	U	3	U	2.8	U	3	U	3.4	UJ	3.9	U	2.9	U	3.2	UJ	2.9	UJ
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	4	U	3.9	U	4.1	U	4	U	**3.95**	J	**10.5**	J	**6.24**	J	**4.43**	J	3.9	U	3.9	U	4.4	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000	4	U	3.9	U	4.1	U	4	U	3.7	U	10.5		4	U	**5.07**	J	3.9	U	3.9	U	4.4	U
CYANIDE (mg/kg)																										
CYANIDE	NE	22.0	46.9	0.073	U	0.069	U	0.072	U	0.07	U	0.064	U	0.07	U	0.073	U	0.068	U	0.068	U	0.07	U	0.077	U
TRITIUM (pCi/g)																										
TRITIUM	NE	NE	NE	4.03	U	3.86	U	4.25	U	4.09	U	4.11	U	4.13	U	4.12	U	4.06	U	4.14	U	4.13	U	4	U

Risk Additivity
Soil Analytical Data
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]
Sample Number			
Sample Date			
Location			
Depth (ft bgs)			
PERCENT SOLIDS	NE	NE	NE
VOLATILES (mg/kg)			
1,1,1-TRICHLOROETHANE	NE	8700	15600
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100
1,1,2-TRICHLOROETHANE	NE	1.1	2.81
1,1-DICHLOROETHANE	NE	3.3	64.5
1,1-DICHLOROETHENE	NE	240	449
1,2,4-TRICHLOROBENZENE	NE	22	73.0
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86
1,2-DIBROMOETHANE	NE	0.034	0.588
1,2-DICHLOROBENZENE	NE	1900	2310
1,2-DICHLOROETHANE	NE	0.43	7.89
1,2-DICHLOROPROPANE	NE	0.94	15.2
1,3-DICHLOROBENZENE	NE	NE	NE
1,4-DICHLOROBENZENE	NE	2.4	31.7
2-HEXANONE	NE	210	NE
ACETONE	NE	61000	66600
BENZENE	NE	1.1	15.4
BROMODICHLOROMETHANE	NE	0.27	5.41
BROMOFORM	NE	62	616
BROMOMETHANE	NE	7.3	16.5
CARBON DISULFIDE	NE	820	1530
CARBON TETRACHLORIDE	NE	0.61	10.8
CHLOROBENZENE	NE	290	376
CHLOROETHANE	NE	15000	29800
CHLOROFORM	NE	0.29	5.86
CHLOROMETHANE	NE	120	275
CIS-1,2-DICHLOROETHYLENE	NE	160	156
CIS-1,3-DICHLOROPROPENE	NE	NE	NE
CYCLOHEXANE	NE	7000	NE
DIBROMOCHLOROMETHANE	NE	0.68	12.1
DICHLORODIFLUOROMETHANE	NE	94	168
ETHYLBENZENE	NE	5.4	68.4
ISOPROPYLBENZENE	NE	2100	2430
METHYL ACETATE	NE	78000	78200
METHYL ETHYL KETONE	NE	28000	37100
METHYL ISOBUTYL KETONE	NE	5300	5820
METHYLCYCLOHEXANE	NE	5630	5630
METHYLENE CHLORIDE	NE	56	409

Risk Additivity Evaluation at Building 1199, Holloman AFB

Analyte	C / N	0-10 ft bgs Max Hit (mg/kg)	Cancer Risk	NC ratio
1,1,1-TRICHLOROETHANE		ND		
1,1,2,2-TETRACHLOROETHANE		ND		
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND		
1,1,2-TRICHLOROETHANE		ND		
1,1-DICHLOROETHANE		ND		
1,1-DICHLOROETHENE		ND		
1,2,4-TRICHLOROBENZENE		ND		
1,2-DIBROMO-3-CHLOROPROPANE		ND		
1,2-DIBROMOETHANE		ND		
1,2-DICHLOROBENZENE		ND		
1,2-DICHLOROETHANE		ND		
1,2-DICHLOROPROPANE		ND		
1,3-DICHLOROBENZENE		ND		
1,4-DICHLOROBENZENE		ND		
2-HEXANONE		ND		
ACETONE		ND		
BENZENE		ND		
BROMODICHLOROMETHANE		ND		
BROMOFORM		ND		
BROMOMETHANE		ND		
CARBON DISULFIDE		ND		
CARBON TETRACHLORIDE		ND		
CHLOROBENZENE		ND		
CHLOROETHANE		ND		
CHLOROFORM		ND		
CHLOROMETHANE		ND		
CIS-1,2-DICHLOROETHYLENE		ND		
CIS-1,3-DICHLOROPROPENE		ND		
CYCLOHEXANE		ND		
DIBROMOCHLOROMETHANE		ND		
DICHLORODIFLUOROMETHANE		ND		
ETHYLBENZENE		ND		
ISOPROPYLBENZENE		ND		
METHYL ACETATE		ND		
METHYL ETHYL KETONE		ND		
METHYL ISOBUTYL KETONE		ND		
METHYLCYCLOHEXANE		ND		
METHYLENE CHLORIDE		ND		

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Analyte			Sample Number		Risk Additivity Evaluation at Building 1199, Holloman AFB				
			Sample Date				0-10 ft bgs		
			Location						
			Depth (ft bgs)						
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]		Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
VOLATILES - continued (mg/kg)					VOLATILES - continued (mg/kg)				
STYRENE	NE	6300	7280		STYRENE		ND		
TERT-BUTYL METHYL ETHER	NE	43	901		TERT-BUTYL METHYL ETHER		ND		
TETRACHLOROETHYLENE	NE	22	7.02		TETRACHLOROETHYLENE		ND		
TOLUENE	NE	5000	5270		TOLUENE		ND		
TRANS-1,2-DICHLOROETHENE	NE	150	270		TRANS-1,2-DICHLOROETHENE		ND		
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		TRANS-1,3-DICHLOROPROPENE		ND		
TRICHLOROETHYLENE	NE	0.91	8.77		TRICHLOROETHYLENE		ND		
TRICHLOROFLUOROMETHANE	NE	790	1410		TRICHLOROFLUOROMETHANE		ND		
VINYL CHLORIDE	NE	0.06	0.728		VINYL CHLORIDE		ND		
XYLENES, TOTAL	NE	630	814		XYLENES, TOTAL		ND		
SEMIVOLATILES (mg/kg)					SEMIVOLATILES (mg/kg)				
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		2,2'-OXYBIS(1-CHLORO)PROPANE		ND		
2,4,5-TRICHLOROPHENOL	NE	6100	6110		2,4,5-TRICHLOROPHENOL		ND		
2,4,6-TRICHLOROPHENOL	NE	44	61.1		2,4,6-TRICHLOROPHENOL		ND		
2,4-DICHLOROPHENOL	NE	180	183		2,4-DICHLOROPHENOL		ND		
2,4-DIMETHYLPHENOL	NE	1200	1220		2,4-DIMETHYLPHENOL		ND		
2,4-DINITROPHENOL	NE	120	122		2,4-DINITROPHENOL		ND		
2,4-DINITROTOLUENE	NE	1.6	15.7		2,4-DINITROTOLUENE		ND		
2,6-DINITROTOLUENE	NE	61	61.1		2,6-DINITROTOLUENE		ND		
2-CHLORONAPHTHALENE	NE	6300	6260		2-CHLORONAPHTHALENE		ND		
2-CHLOROPHENOL	NE	390	391		2-CHLOROPHENOL		ND		
2-METHYLNAPHTHALENE	NE	230	NE		2-METHYLNAPHTHALENE		ND		
2-METHYLPHENOL	NE	3100	NE		2-METHYLPHENOL		ND		
2-NITROANILINE	NE	610	NE		2-NITROANILINE		ND		
2-NITROPHENOL	NE	NE	NE		2-NITROPHENOL		ND		
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		3,3'-DICHLOROBENZIDINE		ND		
3-NITROANILINE	NE	NE	NE		3-NITROANILINE		ND		
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		4,6-DINITRO-2-METHYLPHENOL		ND		
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		4-BROMOPHENYL PHENYL ETHER		ND		
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		4-CHLORO-3-METHYLPHENOL		ND		
4-CHLOROANILINE	NE	2.4	NE		4-CHLOROANILINE		ND		
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		4-CHLOROPHENYL PHENYL ETHER		ND		
4-NITROANILINE	NE	24	NE		4-NITROANILINE		ND		
4-NITROPHENOL	NE	NE	NE		4-NITROPHENOL		ND		
ACENAPHTHENE	NE	3400	3440		ACENAPHTHENE		ND		
ACENAPHTHYLENE	NE	NE	NE		ACENAPHTHYLENE		ND		
ACETOPHENONE	NE	7800	7820		ACETOPHENONE		ND		
ANTHRACENE	NE	17000	17200		ANTHRACENE		ND		
ATRAZINE	NE	2.1	NE		ATRAZINE		ND		

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Analyte			Sample Number		Risk Additivity Evaluation at Building 1199, Holloman AFB				
			Sample Date						
			Location				0-10 ft bgs		
			Depth (ft bgs)						
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]		Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
SEMIVOLATILES - continued (mg/kg)					SEMIVOLATILES - continued (mg/kg)				
BENZALDEHYDE	NE	7800	NE		BENZALDEHYDE		ND		
BENZO(A)ANTHRACENE	NE	0.15	1.48		BENZO(A)ANTHRACENE		ND		
BENZO(A)PYRENE	NE	0.015	0.148		BENZO(A)PYRENE		ND		
BENZO(B)FLUORANTHENE	NE	0.15	1.48		BENZO(B)FLUORANTHENE		ND		
BENZO(G,H,I)PERYLENE	NE	NE	NE		BENZO(G,H,I)PERYLENE		ND		
BENZO(K)FLUORANTHENE	NE	1.5	14.8		BENZO(K)FLUORANTHENE		ND		
BENZYL BUTYL PHTHALATE	NE	260	NE		BENZYL BUTYL PHTHALATE		ND		
BIPHENYL	NE	51	57.1		BIPHENYL		ND		
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE		BIS(2-CHLOROETHOXY) METHANE		ND		
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68		BIS(2-CHLOROETHYL) ETHER		ND		
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347		BIS(2-ETHYLHEXYL) PHTHALATE		ND		
CAPROLACTAM	NE	31000	NE		CAPROLACTAM		ND		
CARBAZOLE	NE	NE	NE		CARBAZOLE		ND		
CHRYSENE	NE	15	148		CHRYSENE		ND		
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148		DIBENZ(A,H)ANTHRACENE		ND		
DIBENZOFURAN	NE	78	NE		DIBENZOFURAN		ND		
DIETHYL PHTHALATE	NE	49000	48900		DIETHYL PHTHALATE		ND		
DIMETHYL PHTHALATE	NE	611000	611000		DIMETHYL PHTHALATE		ND		
DI-N-BUTYL PHTHALATE	NE	6100	6110		DI-N-BUTYL PHTHALATE		ND		
DI-N-OCTYLPHTHALATE	NE	730	NE		DI-N-OCTYLPHTHALATE		ND		
FLUORANTHENE	NE	2300	2290		FLUORANTHENE		ND		
FLUORENE	NE	2300	2290		FLUORENE		ND		
HEXACHLOROBENZENE	NE	0.3	3.04		HEXACHLOROBENZENE		ND		
HEXACHLOROBUTADIENE	NE	6.2	61.1		HEXACHLOROBUTADIENE		ND		
HEXACHLOROCYCLOPENTADIENE	NE	370	367		HEXACHLOROCYCLOPENTADIENE		ND		
HEXACHLOROETHANE	NE	12	42.8		HEXACHLOROETHANE		ND		
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48		INDENO(1,2,3-C,D)PYRENE		ND		
ISOPHORONE	NE	510	5120		ISOPHORONE		ND		
M,P-CRESOL	NE	NE	NE		M,P-CRESOL		ND		
NAPHTHALENE	NE	3.6	43.0		NAPHTHALENE		ND		
NITROBENZENE	NE	4.8	53.5		NITROBENZENE		ND		
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE		N-NITROSODI-N-PROPYLAMINE		ND		
N-NITROSODIPHENYLAMINE	NE	99	993		N-NITROSODIPHENYLAMINE		ND		
PENTACHLOROPHENOL	NE	0.89	8.94		PENTACHLOROPHENOL		ND		
PHENANTHRENE	NE	1830	1830		PHENANTHRENE		ND		
PHENOL	NE	18000	18300		PHENOL		ND		
PYRENE	NE	1700	1720		PYRENE		ND		

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Analyte			Sample Number									
			Sample Date									
			Location									
			Depth (ft bgs)									
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]									
EXPLOSIVES (mg/kg)												
1,3,5-TRINITROBENZENE	NE	2200.0	NE									
1,3-DINITROBENZENE	NE	6.10	NE									
2,4,6-TRINITROTOLUENE	NE	19.0	39.1									
2,4-DINITROTOLUENE	NE	1.60	15.7									
2,6-DINITROTOLUENE	NE	61.0	61.1									
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE									
2-NITROTOLUENE	NE	2.90	29.1									
3-NITROTOLUENE	NE	6.10	7.82									
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE									
4-NITROTOLUENE	NE	30.0	244.4									
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2									
NITROBENZENE	NE	4.80	53.5									
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7									
TETRYL	NE	240.0	244.0									
METALS (mg/kg)												
ALUMINUM	13722	77000	78000									
ANTIMONY	1.6	31	31.3									
ARSENIC	3.7	0.39	3.90									
BARIUM	169.3	15000	15600									
BERYLLIUM	1.6	160	156									
CADMIUM	0.3	70	70.3									
CALCIUM	317332	NE	NE									
CHROMIUM[d]	25	117000	117000									
COBALT	7.7	23	NE									
COPPER	13	3100	3130									
IRON	23049	55000	54800									
LEAD	10.9	400	400									
MAGNESIUM	16991	NE	NE									
MANGANESE	393	1800	1860									
MERCURY	0.0108	10	15.6									
NICKEL	17.4	1500	1560									
POTASSIUM	5077	NE	NE									
SELENIUM	1.4	390	391									
SILVER	1.1	390	391									
SODIUM	5196	NE	NE									
THALLIUM	1.3	0.78	0.782									
VANADIUM	42.6	390	391									
ZINC	54.6	23000	23500									

Risk Additivity Evaluation at Building 1199, Holloman AFB

		0-10 ft bgs			
Analyte	**C / N**	**Max Hit (mg/kg)**	**Cancer Risk**	**NC ratio**	
EXPLOSIVES (mg/kg)					
1,3,5-TRINITROBENZENE		ND			
1,3-DINITROBENZENE		ND			
2,4,6-TRINITROTOLUENE		ND			
2,4-DINITROTOLUENE		ND			
2,6-DINITROTOLUENE		ND			
2-AMINO-4,6-DINITROTOLUENE		ND			
2-NITROTOLUENE		ND			
3-NITROTOLUENE		ND			
4-AMINO-2,6-DINITROTOLUENE		ND			
4-NITROTOLUENE		ND			
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE		ND			
NITROBENZENE		ND			
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE		ND			
TETRYL		ND			
METALS (mg/kg)					
ALUMINUM	N	5540			
ANTIMONY		ND			
ARSENIC	C	1.2	3.08E-06		
BARIUM	N	72.8		0.0047	
BERYLLIUM		ND			
CADMIUM		ND			
CALCIUM	NUTRIENT	260000			
CHROMIUMd	N	4.8		0.000041	
COBALT	N	1.8		0.078	RSL
COPPER	N	2.8		0.00089	
IRON	N	4660		0.085	
LEAD	N	4		0.010	
MAGNESIUM	NUTRIENT	3690			
MANGANESE	N	99.9		0.054	
MERCURY		ND			
NICKEL	N	4		0.0026	
POTASSIUM	NUTRIENT	1500			
SELENIUM		ND			
SILVER		ND			
SODIUM	NUTRIENT	856			
THALLIUM		ND			
VANADIUM	N	11.8		0.030	
ZINC	N	15.1		0.00064	

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Analyte			Sample Number	
			Sample Date	
			Location	
			Depth (ft bgs)	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	
PCBs (mg/kg)				
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	
PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	
OIL RANGE ORGANICS C28-C40	NE	NE	1000	
CYANIDE (mg/kg)				
CYANIDE	NE	22.0	46.9	
TRITIUM (pCi/g)				
TRITIUM	NE	NE	NE	

Risk Additivity Evaluation at Building 1199, Holloman AFB

		0-10 ft bgs		
Analyte	**C / N**	**Max Hit (mg/kg)**	**Cancer Risk**	**NC ratio**
PCBs (mg/kg)				
PCB-1016 (AROCLOR 1016)		ND		
PCB-1221 (AROCLOR 1221)		ND		
PCB-1232 (AROCLOR 1232)		ND		
PCB-1242 (AROCLOR 1242)		ND		
PCB-1248 (AROCLOR 1248)		ND		
PCB-1254 (AROCLOR 1254)		ND		
PCB-1260 (AROCLOR 1260)		ND		
PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10		ND		
DIESEL RANGE ORGANICS C10-C28	N	10.5		0.011
OIL RANGE ORGANICS C28-C40	N	10.5		0.011
CYANIDE (mg/kg)				
CYANIDE		ND		
TRITIUM (pCi/g)				
TRITIUM		ND		
SUM:			**3.1E-06**	**0.29**

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Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
R = result rejected during data validation
RCRA = Resource Conservation Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Appendix M
Ecological Evaluation

NEW MEXICO ENVIRONMENT DEPARTMENT
SITE ASSESSMENT CHECKLIST
(From NMED (2012) Attachment A)

I. SITE LOCATION

1. Site Name: Building 1199 (OT-C536) Inactive Septic System
   US EPA I.D. Number: NM6572124422
   Location: Tularosa Basin within Holloman Air Force Base (HAFB)
   County: Otero
   City: HAFB _____ State: NM

2. Latitude: 32º 52´ 37.138˝ N Longitude: 106º 6´ 4.954˝ W

3. Attach site maps, including a topographical map, a diagram which illustrates the layout of the facility (e.g., site boundaries, structures, etc.), and maps showing all habitat areas identified in Section III of the checklist. Also, include maps which illustrate known release areas, sampling locations, and any other important features, if available.

Note: Site maps and supporting information that include (1) a Physiographic Map, (2) a Site Layout and Sampling Location Map, and (3) a Site Photo Log are generally included for all sites in the RFI reports. A site habitat map and a Google Earth photo that shows the site habitat are attached to this Site Assessment Checklist.

II. SITE CHARACTERIZATION

1. Indicate the approximate area of the site (i.e., acres or sq. ft): Approximately 1 acre

2. Provide an approximate breakdown of the land uses on the site:

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	_____% Undisturbed	100% Other[c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, etc.):
_____

[b]For agricultural areas, please list the crops and/or livestock which are present:
_____

[c]For areas designated as "other", please describe the usage of the area:
Building 1199 was constructed in 1957 as a rocket fuel laboratory. The fuels laboratory contained a toilet, urinal, lavatory, and shower. In 1987, the building was converted to the security forces kennel. After conversion, the building contained a toilet, urinal, and stainless steel sink. The Septic Tanks Report (Included as Appendix A of the RFI Report) indicated

that the septic system was inactive as of 2006. The septic tank was abandoned in place in January 2008 by opening the tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill (North Wind, Inc., 2008). Building 1199 was razed some time after the septic tank abandonment; demolition records are not available. The site is currently unused.

3. Provide an approximate breakdown of the land uses in the area surrounding the site. Indicate the radius (in miles) of the area described: approximately 0.5 mile

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	80 % Undisturbed	20 % Other [c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, golf course, etc.):

_____

[b]For agricultural areas, please list the crops and/or livestock which are present:

_____

[c]For areas designated as "other", please describe the usage of the area:
Habitat Map for Holloman AFB (attached) shows that habitat within 0.5 mile radius is dominated by fourwing saltbush/alkali sacaton shrubland, with areas of alkali sacaton grassland intermixed. There is also some areas to the north of the site that are shown as Development/Ground Disturbance.

4. Describe reasonable and likely future land and/or water use(s) at the site.
Land use is likely to remain the same.

5. Describe the historical uses of the site. Include information on chemical releases that may have occurred as a result of previous land uses. For each chemical release, provide information on the form of the chemical released (i.e., solid, liquid, vapor) and the known or suspected causes or mechanism of the release (i.e., spills, leaks, material disposal, dumping, explosion, etc.).

_____

Building 1199 was constructed in 1957 as a rocket fuel laboratory. The fuels laboratory contained a toilet, urinal, lavatory, and shower. In 1987, the building was converted to the security forces kennel. After conversion, the building contained a toilet, urinal, and stainless steel sink. The Septic Tanks Report (Included as Appendix A of the RFI Report) indicated that the septic system was inactive as of 2006. The septic tank was abandoned in place in January 2008 by opening the tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill (North Wind, Inc., 2008). Building 1199 was razed some time after the septic tank abandonment; demolition records are not available. The site is currently unused.

6. If any movement of soil has taken place at the site, describe the degree of the

disturbance. Indicate the likely source of any disturbances (e.g., erosion, agricultural, mining, industrial activities, removals, etc.) and estimate when these events occurred.

Site disturbances of soil have been limited to excavation activities associated with building construction and septic system installation and septic system closure activities.

7. Describe the current uses of the site. Include information on recent (previous 5 years) disturbances or chemical releases that have occurred. For each chemical release, provide information on the form of the chemical released and the causes or mechanism of the release.

The site is currently unused. The septic system was abandoned in place in January 2008 by opening the tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill (North Wind, Inc., 2008). Building 1199 was razed some time after the septic tank abandonment; demolition records are not available.

8. Identify the location or suspected location of chemical releases at the site. Provide an estimate of the distance between these locations and the areas identified in Section III.

Chemical releases that may have occurred are associated with septic system leakage.

9. Identify the suspected contaminants of concern (COCs) at the site. If known, include the maximum contaminant levels. Please indicate the source of data cited (e.g., RFI, confirmatory sampling, etc.).

As documented in the RFI, detected constituents from soil samples collected include several metals and petroleum hydrocarbons (both diesel and oil range). Additionally, samples were analyzed for VOCs, SVOCs, explosives, PCBs, cyanide, and tritium; however all were non-detect in soil samples from the site (for 0 to 10 feet bgs, the zone of interest for ecological receptors).

10. Identify the media (e.g., soil (surface or subsurface), surface water, air, groundwater) which are known or suspected to contain COCs. _____
Surface and subsurface soil, and potentially, groundwater

11. Indicate the approximate depth to groundwater (in feet below ground surface [(bgs)].

Depth to groundwater as measured from monitoring well OTC536-MW01 is approximately 26 feet from top of PVC casing.

.

12. Indicate the direction of groundwater flow (e.g., north, southeast, etc.)

According to Figure 2-3 of the RFI report, the direction of groundwater flow at Holloman AFB has been shown to be generally from northeast to southwest. The groundwater flow direction at Building 1199 is generally to the southwest.

III. HABITAT EVALUATION

III.A Wetland Habitats

Are any wetland[1] areas such as marshes or swamps on or adjacent to the site?

☐ Yes X No

If yes, indicate the wetland area on the attached site map and answer the following questions regarding the wetland area. If more than one wetland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wetland area. Distinguish between wetland areas by using names or other designations (such as location), and clearly identify each area on the site map. Also, obtain and attach a National Wetlands Inventory Map (or maps) to illustrate each wetland area.

Identify the sources of the observations and information (e.g., National Wetland Inventory, Federal or State Agency, USGS topographic maps) used to make the determination that wetland areas are or are not present.

The Integrated Natural Resource Management Plan for Holloman AFB (HAFB, 2011) and site observations.

If no wetland areas are present, proceed to Section III.B.

1Wetlands are defined in 40 CFR §232.2 as " Areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Examples of typical wetlands plants include: cattails, cordgrass, willows and cypress trees. National wetland inventory maps may be available at http:\\nwi.fws.gov. Additional information on wetland delineation criteria is also available from the Army Corps of Engineers.

Wetland Area Questions

☐ Onsite ☐ Offsite

Name or
Designation:_____

1. Indicate the approximate area of the wetland (acres or ft^2)_____

2. Identify the type(s) of vegetation present in the wetland.

   - ❑ Submergent (i.e., underwater) vegetation
   - ❑ Emergent (i.e., rooted in the water, but rising above it) vegetation
   - ❑ Floating vegetation
   - ❑ Scrub/shrub
   - ❑ Wooded
   - ❑ Other (Please describe):_____

3. Estimate the vegetation density of the wetland area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Is standing water present? ☐ Yes ☐ No

   If yes, is the water primarily: ☐ Fresh or ☐ Brackish
   Indicate the approximate area of the standing water (ft^2): _____
   Indicate the approximate depth of the standing water, if known (ft. or in.)_____

5. If known, indicate the source of the water in the wetland.

   - ❑ Stream/River/Creek/Lake/Pond
   - ❑ Flooding
   - ❑ Groundwater
   - ❑ Surface runoff

6. Is there a discharge from the facility to the wetland? ☐ Yes ☐ No

   If yes, please
   describe:_____
   _____
   _____
   _____
   _____

Wetland Area Questions (Continued)

7. Is there a discharge from the wetland? ☐ Yes ☐ No
   If yes, indicate the type of aquatic feature the wetland discharges into:

   - ❑ Surface stream/River (Name:_____)
   - ❑ Lake/Pond (Name:_____)
   - ❑ Groundwater
   - ❑ Not sure

8. Does the area show evidence of flooding? ☐ Yes ☐ No
   If yes, indicate which of the following are present (mark all that apply):

   - ❑ Standing water
   - ❑ Water-saturated soils
   - ❑ Water marks
   - ❑ Buttressing
   - ❑ Debris lines
   - ❑ Mud cracks
   - ❑ Other (Please describe):_____

9. Animals observed in the wetland area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:
   _____
   _____
   _____
   _____

III.B Aquatic Habitats

III.B.1 Non-Flowing Aquatic Features

Are any non-flowing aquatic features (such as ponds or lakes) located at or adjacent to the site?

☐ Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the non-flowing aquatic features. If more than one non-flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.B.2.

Non-Flowing Aquatic Feature Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Indicate the type of aquatic feature present:

   - ❑ Natural (e.g., pond or lake)
   - ❑ Man-made (e.g., impoundment, lagoon, canal, etc.)

2. Estimate the approximate size of the water body (in acres or sq. ft.)_____

3. If known, indicate the depth of the water body (in ft. or in.)._____

Non-Flowing Aquatic Feature Questions (Continued)

4. Indicate the general composition of the bottom substrate. Mark all sources that apply from the following list.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

☐ Other (please specify):_____

5. Indicate the source(s) of the water in the aquatic feature. Mark all sources that apply from the following list.

- ❑ River/Stream/Creek
- ❑ Groundwater
- ❑ Industrial Discharge
- ❑ Surface Runoff
- ❑ Other (please specify):_____

6. Is there a discharge from the facility to the aquatic feature? ☐ Yes ☐ No
   If yes, describe the origin of each discharge and its migration path:
   _____
   _____
   _____
   _____

7. Does the aquatic feature discharge to the surrounding environment? ☐ Yes ☐ No
   If yes, indicate the features from the following list into which the aquatic feature discharges, and indicate whether the discharge occurs onsite or offsite:

- ❑ River/Stream/Creek ☐ onsite ☐ offsite
- ❑ Groundwater ☐ onsite ☐ offsite
- ❑ Wetland ☐ onsite ☐ offsite
- ❑ Impoundment ☐ onsite ☐ offsite
- ❑ Other (please describe)_____

Non-Flowing Aquatic Feature Questions (Continued)

8. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Fish
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, turtles)
- ❑ Amphibians (e.g., frogs, salamanders)
- ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

Specify species, if known:

_____
_____
_____
_____

III.B.2 Flowing Aquatic Features

Are any flowing aquatic features (such as streams or rivers) located at or adjacent to the site?

☐ Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the flowing aquatic features. If more than one flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map

If no, proceed to Section III.C.

Flowing Aquatic Feature Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Indicate the type of flowing aquatic feature present.

   - ❑ River
   - ❑ Stream
   - ❑ Creek
   - ❑ Brook
   - ❑ Dry wash
   - ❑ Arroyo
   - ❑ Intermittent stream
   - ❑ Artificially created (ditch, etc.)
   - ❑ Other (specify)
   - ❑

2. Indicate the general composition of the bottom substrate.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

   ☐ Other (please specify):_____

3. Describe the condition of the bank (e.g., height, slope, extent of vegetative cover) of the aquatic feature.

   _____
   _____
   _____
   _____

4. Is there a discharge from the facility to the aquatic feature? ☐ Yes ☐ No
   If yes, describe the origin of each discharge and its migration path:

   _____
   _____
   _____
   _____

5. Indicate the discharge point of the water body. Specify name, if known.

   _____
   _____
   _____

Flowing Aquatic Feature Questions (Continued)

6. If the flowing aquatic feature is a dry wash or arroyo, answer the following questions.
   - ❑ Check here if feature is not a dry wash or arroyo

   If known, specify the average number of days in a year in which flowing water is present in the feature: _____

   Is standing water or mud present? Check all that apply.
   - ❑ Standing water
   - ❑ Mud
   - ❑ Neither standing water or mud

   Does the area show evidence of recent flow (e.g., flood debris clinging to vegetation)?
   - ❑ Yes
   - ❑ No
   - ❑ Not sure
7. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:

   _____
   _____
   _____
   _____

III.C Terrestrial Habitats

III.C.1 Wooded

Are any wooded areas on or adjacent to the site? ☐ Yes X No

If yes, indicate the wooded area on the attached site map and answer the following questions. If more than one wooded area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wooded area. Distinguish between wooded areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.2.

Wooded Area Questions

☐ On-site ☐ Off-site

Name or Designation:_____

1. Estimate the approximate size of the wooded area (in acres or sq. ft.)

2. Indicate the dominant type of vegetation in the wooded area.

   - ❑ Evergreen
   - ❑ Deciduous
   - ❑ Mixed

Dominant plant species, if known:_____

3. Estimate the vegetation density of the wooded area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the predominant size of the trees at the site. Use diameter at chest height.

   - ❑ 0-6 inches
   - ❑ 6-12 inches
   - ❑ >12 inches
   - ❑ No single size range is predominant

5. Animals observed in the wooded area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:_____

III.C.2 Shrub/Scrub

Are any shrub/scrub areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the shrub/scrub area on the attached site map and answer the following questions. If more than one shrub/scrub area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual shrub/scrub area. Distinguish between shrub/scrub areas, using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.3.

Shrub/Scrub Area Questions

X Onsite X Offsite

Name or Designation: Chihuahuan Desert Scrub (HAFB, 2011).

Note also: On-site areas are almost entirely gravel covered and void of habitat or vegetation with some apparent pockets of desert vegetation. Surrounding site habitat is characterized as Chihuahuan Desert. The habitat map (attached) shows that habitat surrounding the site is dominated by fourwing saltbush/alkali sacaton shrubland habitat, with lesser amounts of fourwing saltbush/gypsum dropseed shrubland and alkali sacaton grassland habitats.

1. Estimate the approximate size of the shrub/scrub area (in acres or sq. ft.). Surrounding HAFB are tens of thousands of acres of Chihuahuan Desert Scrub.

2. Indicate the dominant type of shrub/scrub vegetation present, if known.

According to information provided in Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011), the area around Building 1199 (OT-C536) is dominated by Fourwing Saltbush/Alkali Sacaton Shrubland with lesser amounts of fourwing saltbush/gypsum dropseed shrubland and alkali sacaton grassland habitats.

3. Estimate the vegetation density of the shrub/scrub area.

- ❑ Dense (i.e., greater than 75% vegetation)
- X Moderate (i.e., 25% to 75% vegetation)
- ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the scrub/shrub vegetation.

- ❑ 0-2 feet
- X 2-5 feet
- ❑ >5 feet

5. Animals observed in the shrub/scrub area or suspected to be present based on indirect evidence or file material:
   - X Birds
   - X Mammals
   - X Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:
   The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna associated with the shrubland habitat potentially present in the area of Building 1199. Surveys conducted at HAFB have identified fourteen species of rodents. Those that

could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam kangaroo rat (*Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus auduboni*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crookzi*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.3 Grassland

Are any grassland areas on or adjacent to the site? ☐ Yes X No

If yes, indicate the grassland area on the attached site map and answer the following questions. If more than one grassland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual grassland area. Distinguish between grassland areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.4.

Grassland Area Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Estimate the approximate size of the grassland area (in acres or sq. ft.)._____

2. Indicate the dominant plant type, if known.
_____
_____
_____
_____

3. Estimate the vegetation density of the grassland area.

- ❑ Dense (i.e., greater than 75% vegetation)
- ❑ Moderate (i.e., 25% to 75% vegetation)
- ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the dominant plant type (in ft. or in.)_

5. Animals observed in the grassland area or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, lizards)
- ❑ Amphibians (e.g., toads, salamanders)

Specify species, if known:

III.C.4 Desert

Are any desert areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the desert area on the attached site map and answer the following questions. If more than one desert area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual desert area. Distinguish between desert areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.5.

Desert Area Questions

X Onsite X Offsite
Name or Designation: Chihuahuan Desert

1. Estimate the approximate size of the desert area (in acres or sq. ft.).
This site including HAFB is contained within tens of thousands of acres of the Chihuahuan Desert.

2. Describe the desert area (e.g., presence or absence of vegetation, vegetation types, presence/size of rocks, sand, etc.)
Many volumes of literature have been written on the natural biota of the Chihuahuan Desert. Detailed descriptions about the biotic communities within HAFB can be found in the HAFB Integrated Natural Resource Management Plan, (HAFB, 2011). Habitats directly associated with this Site include typical desert scrub communities.

3. Animals observed in the desert area or suspected to be present based on indirect evidence or file material:

X Birds
X Mammals
X Reptiles (e.g., snakes, lizards)
☐ Amphibians (e.g., toads, salamanders)

Specify species, if known:

The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna associated with the shrubland habitat potentially present in the area of Building 1199. Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam

kangaroo rat (*Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.5 Other

1. Are there any other terrestrial communities or habitats on or adjacent to the site which were not previously described?

☐ Yes X No

If yes, indicate the "other" area(s) on the attached site map and describe the area(s) below. Distinguish between onsite and offsite areas. If no, proceed to Section III.D.

III.D Sensitive Environments and Receptors

1. Do any other potentially sensitive environmental areas[2] exist adjacent to or within 0.5 miles of the site? If yes, list these areas and provide the source(s) of information used to identify sensitive areas. *Do not answer "no" without confirmation from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

The following is taken from the Integrated Natural Resources Management Plan for HAFB (HAFB,2011). HAFB and its Geographically Separated Units (GSUs) have high biodiversity, including many sensitive species. No threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The White Sands pupfish is not Federally-listed nor has critical habitat been designated because of the multi-agency cooperative agreement to manage the species to support viable populations through habitat management and research.

Most of the sensitive species are birds that are either associated with grassland habitats on main base or with wetland habitats, primarily in the Lake Holloman Public Access Area wetlands complex south of the Cantonment. Sensitive grassland and desert species at HAFB that are discussed in further detail in the management plan include:

- White Sands pupfish

2 Areas that provide unique and often protected habitat for wildlife species. These areas are typically used during critical life stages such as breeding, hatching, rearing of young and overwintering. Refer to **Table 1** at the end of this document for examples of sensitive environments.

- Acarospora clauzadeana lichen
- Grassland neotropical migratory birds
- Western burrowing owl
- Aplomado falcon
- Grassland raptors
- Bats
- Texas horned lizard and other reptiles

2. Are any areas on or near (i.e., within 0.5 miles) the site which are owned or used by local tribes? If yes, describe. *Contact the Tribal Liason in the Office of the Secretary (505)827-2855 to obtain this information.*

No

3. Does the site serve or potentially serve as a habitat, foraging area, or refuge by rare, threatened, endangered, candidate and/or proposed species (plants or animals), or any otherwise protected species? If yes, identify species. *This information should be obtained from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

No, based on information in the Integrated Natural Resources Management Plan, no threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The plan establishes protocols for management of sensitive desert and grassland habitats.

4. Is the site potentially used as a breeding, roosting or feeding area by migratory bird species? If yes, identify which species.

Likely not. The site has very limited viable habitat due to the disturbed nature of the site, but areas surrounding the site could potentially provide habitat for these purposes.

5. Is the site used by any ecologically[3], recreationally, or commercially important species? If yes, explain.

No

3 Ecologically important species include populations of species which provide a critical (i.e., not replaceable) food resource for higher organisms and whose function as such would not be replaced by more tolerant species; or perform a critical ecological function (such as organic matter decomposition) and whose functions will not be replaced by other species. Ecologically important species include pest and opportunistic species that populate an area if they serve as a food source for other species, but do not include domesticated animals (e.g., pets and livestock) or plants/animals whose existence is maintained by continuous human interventions (e.g., fish hatcheries, agricultural crops, etc.,)

IV. EXPOSURE PATHWAY EVALUATION

1. Do existing data provide sufficient information on the nature, rate, and extent of contamination at the site?

   X Yes
   ❑ No
   ❑ Uncertain

   Please provide an explanation for your answer: Sample results have sufficiently characterized the site.

2. Do existing data provide sufficient information on the nature, rate, and extent of contamination in offsite affected areas?

   □ Yes
   ❑ No
   ❑ Uncertain
   X No offsite contamination

   Please provide an explanation for your answer:
   No offsite contamination is expected, and no off-site soil or groundwater samples were collected.

3. Do existing data address potential migration pathways of contaminants at the site?

   X Yes
   ❑ No
   ❑ Uncertain

   Please provide an explanation for your answer

   While potential migration from impacted soils to groundwater might occur, ecological receptors are not expected to have contact with groundwater.

4. Do existing data address potential migration pathways of contaminants in offsite affected areas?

   □ Yes
   ❑ No
   ❑ Uncertain
   X No offsite contamination

   Please provide an explanation for your answer:

   See response to No. 3 presented previously. Also, no off-site soil contamination is expected.

5. Are there visible indications of stressed habitats or receptors on or near (i.e., within 0.5 miles) the site that may be the result of a chemical release? If yes, explain. Attach photographs if available.

No.

6. Is the location of the contamination such that receptors might be reasonably expected to come into contact with it? For soil, this means contamination in the soil 0 to 5 feet below ground surface (bgs). If yes, explain.

Yes. Some soil samples were collected in site areas where receptors might contact detected constituents.

7. Are receptors located in or using habitats where chemicals exist in air, soil, sediment or surface water? If yes, explain.

Yes. See response to No. 6 presented above.

8. Could chemicals reach receptors via groundwater? Can chemicals leach or dissolve to groundwater? Are chemicals mobile in groundwater? Does groundwater discharge into receptor habitats? If yes, explain.

No. Groundwater does not discharge into receptor habitats at or near the site.

9. Could chemicals reach receptors through runoff or erosion? Answer the following questions:

What is the approximate distance from the contaminated area to the nearest watercourse or arroyo?

- ❑ 0 feet (i.e., contamination has reached a watercourse or arroyo)
- ❑ 1-10 feet
- ❑ 11-20 feet
- ❑ 21-50 feet
- ❑ 51-100 feet
- ❑ 101-200 feet
- ❑ > 200 feet
- ❑ > 500 feet
- X > 1000 feet

What is the slope of the ground in the contaminated area?

- X 0-10%
- ❑ 10-30%
- ❑ > 30%

What is the approximate amount of ground and canopy vegetative cover in the contaminated area?

- ❑ < 25%
- X 25-75%
- ❑ > 75%

Is there visible evidence of erosion (e.g., a rill or gully) in or near the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

Do any structures, pavement, or natural drainage features direct run-on flow (i.e., surface flows originating upstream or uphill from the area of concern) into the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

10. Could chemicals reach receptors through the dispersion of contaminants in air (e.g., volatilization, vapors, fugitive dust)? If yes, explain.

Yes. However, detected concentrations of constituents in soil do not generally exceeding relevant background values or ecological screening criteria (see screening assessment in main text).

11. Could chemicals reach receptors through migration of non-aqueous phase liquids (NAPLs)? Is a NAPL present at the site that might be migrating towards receptors or habitats? Could NAPL discharge contact receptors or their habitat?

No NAPLs are present at the site.

12. Could receptors be impacted by external irradiation at the site? Are gamma emitting radionuclides present at the site? Is the radionuclide contamination buried or at the surface?

No. No radionuclide contamination is expected to be present at the site.

PHOTOGRAPHIC DOCUMENTATION

During the site visit(s), photographs should be taken to document the current conditions at the site and to support the information entered in the checklist. For example, photographs may be used to document the following:

- The nature, quality, and distribution of vegetation at the site
- Receptors or evidence of receptors
- Potentially important ecological features, such as ponds and drainage ditches
- Potential exposure pathways
- Any evidence of contamination or impact

SUMMARY OF OBSERVATIONS AND SITE SETTING

Include information on significant source areas and migration pathways that are likely to constitute complete exposure pathways.

Although potentially complete exposure pathways exist (e.g. direct contact with surface soil), significant source areas are not present, as results of the screening assessment (see main text) indicate that detected concentrations of constituents in soil do not generally exceeding relevant ecological screening criteria.

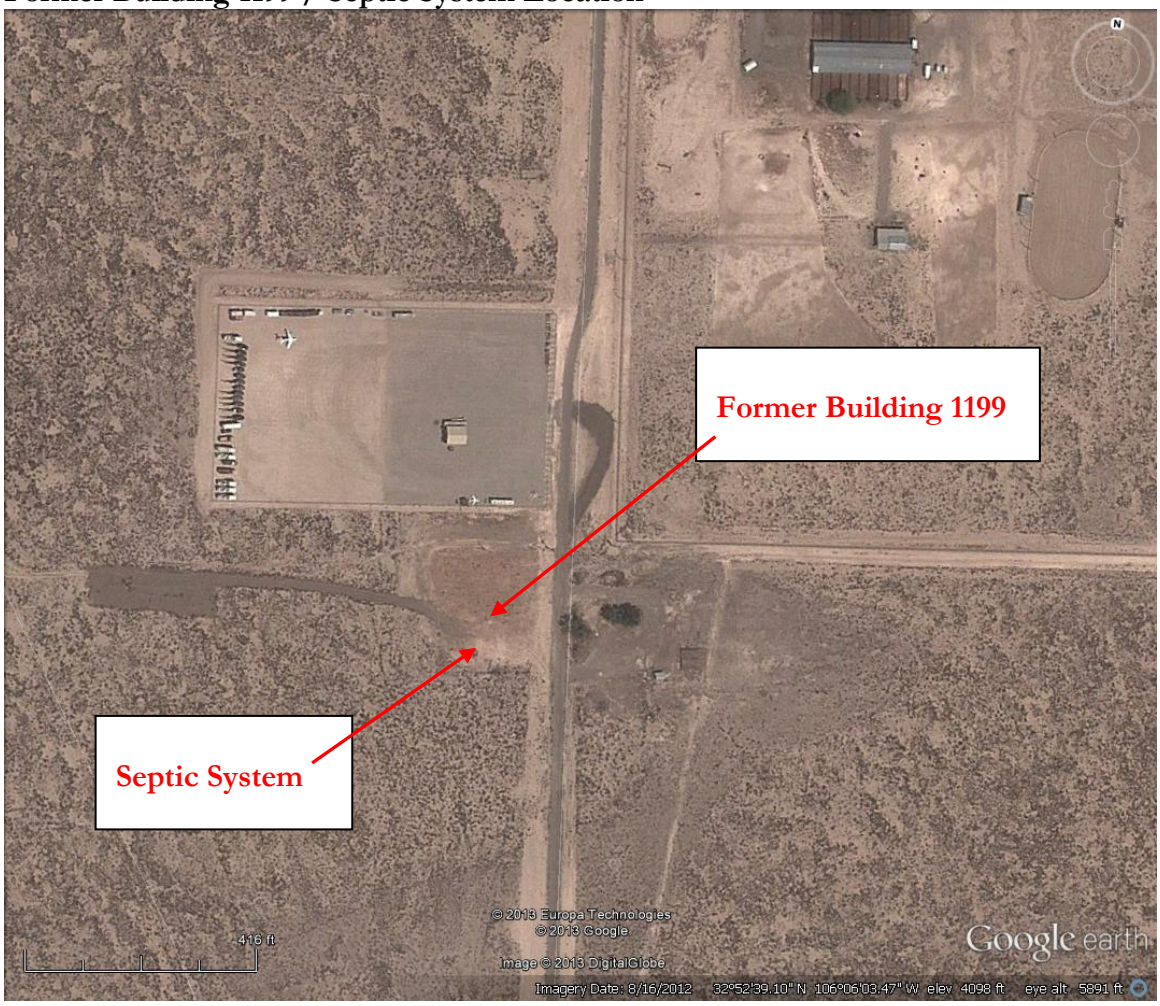
Checklist Completed by William Squire

Affiliation CB&I Federal Services, LLC.

Author Assisted by William Stanhope, CB & I Federal Services, LLC.

Date July 25, 2013

Former Building 1199 / Septic System Location



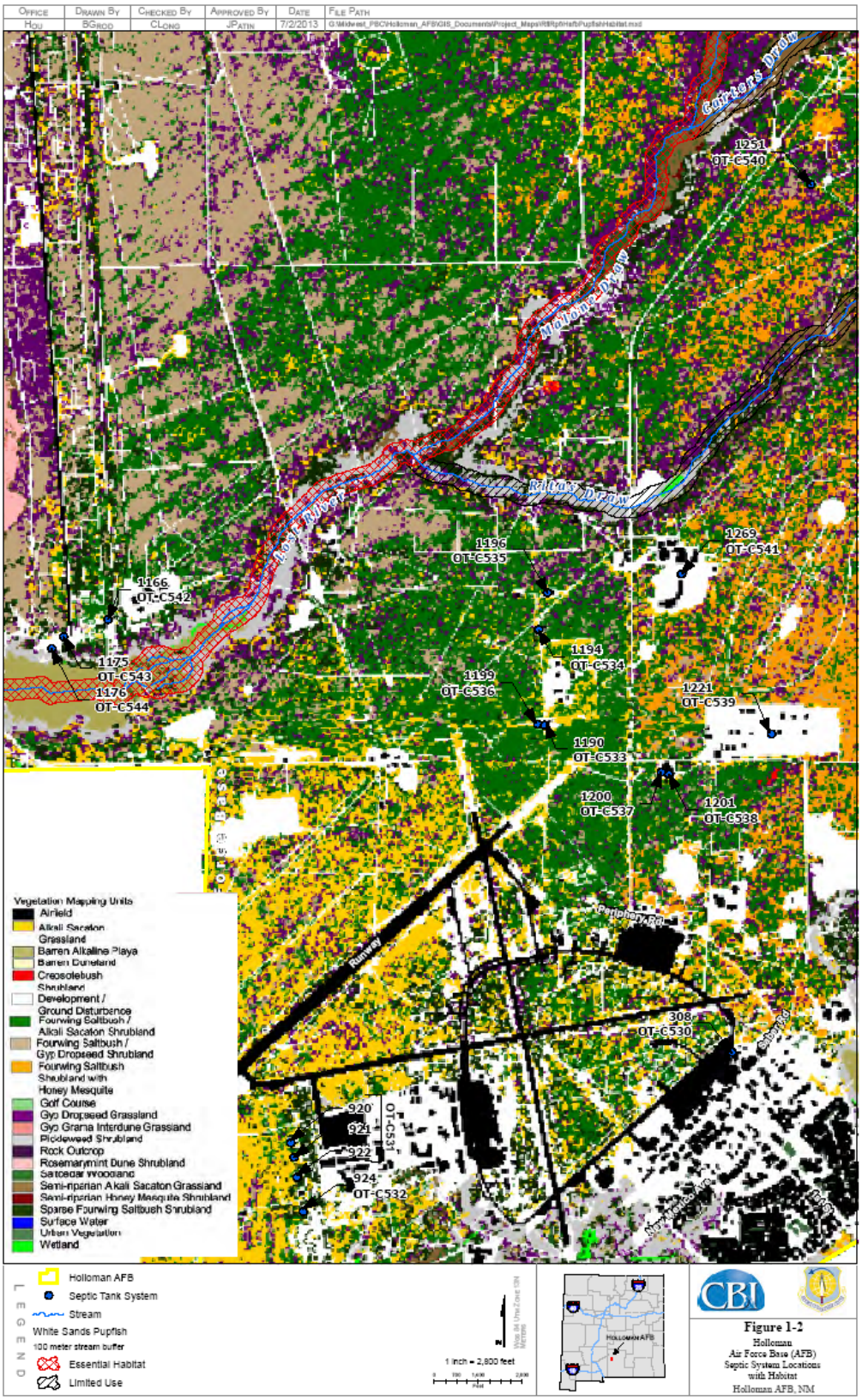


Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
with Habitat
Holloman AFB, NM

REFERENCES

Holloman Air Force Base (HAFB), 2011. *Integrated Natural Resource Management Plan*, February.

Holloman Air Force Base (HAFB), 2007. *Holloman Air Force Base Septic Tanks*, April.

New Mexico Environment Department (NMED), 2012. *Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document*, Hazardous Waste Bureau and Ground Water Quality Bureau, February, Table A-1 updated June 2012.

North Wind, Inc., 2008. *Technical Memorandum Summarizing Decommissioning Work Conducted on Inactive Septic Tanks at Holloman AFB*, March.

TABLE 1
EXAMPLES OF SENSITIVE ENVIRONMENTS

National Parks and National Monuments

Designated or Administratively Proposed Federal Wilderness Areas

National Preserves

National or State Wildlife Refuges

National Lakeshore Recreational Areas

Federal land designated for protection of natural ecosystems

State land designated for wildlife or game management

State designated Natural Areas

Federal or state designated Scenic or Wild River

All areas that provide or could potentially provide critical habitat[1] for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern

All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes

All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)

---

1 Critical habitats are defined by the Endangered Species Act (50 CFR §424.02(d)) as:

> 1) Specific areas within the geographical area currently occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (ii) that may require special management considerations or protection, and 2) Specific areas outside the geographical area occupied by a species at the time it is listed upon a determination by the Secretary [of Interior] that such areas are essential for the conservation of the species.

All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)

All areas that provide or could potentially provide habitat for song birds as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-13)

All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)

All areas that provide or could potentially provide habitat for horned toads and Bullfrogs as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, resp.)

All perennial waters (e.g., rivers, lakes, playas, sloughs, ponds, etc)

All ephemeral drainage (e.g., arroyos, puddles/pools, intermittent streams, etc) that provide significant wildlife habitat or that could potentially transport contaminants off site to areas that provide wildlife habitat

All riparian habitats

All perennial and ephemeral wetlands (not limited to jurisdictional wetlands)

All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle.

ATTACHMENT B

ECOLOGICAL SITE EXCLUSION CRITERIA CHECKLIST AND DECISION TREE

1. NEW MEXICO ECOLOGICAL EXCLUSION CRITERIA CHECKLIST

The following questions are designed to be used in conjunction with the Ecological Exclusion Criteria Decision Tree (Figure 1). After answering each question, refer to the Decision Tree to determine the appropriate next step. In some cases, questions will be omitted as the user is directed to another section as indicated by the flow diagram in the Decision Tree. For example, if the user answers "yes" to Question 1 of Section I, he or she is directed to proceed to Section II.

I. Habitat

In the following questions, "affected property" refers to all property on which a release has occurred or is believed to have occurred, including off-site areas where contamination may have occurred or migrated.

1. Are any of the below-listed sensitive environments at, adjacent to, or in the locality1 of the affected property?

   - National Park or National Monument
   - Designated or administratively proposed Federal Wilderness Area
   - National Preserve
   - National or State Wildlife Refuge
   - Federal or State land designated for wildlife or game management
   - State designated Natural Areas
   - All areas that are owned or used by local tribes
   - All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle
   - All areas that provide or could potentially provide habitat for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern
   - All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes
   - All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)
   - All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)
   - All areas that provide or could potentially provide habitat for song birds as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game

1 *Locality* of the site refers to any area where an ecological receptor is likely to contact site-related chemicals. The locality of the site considers the likelihood of contamination migrating over time and places the site in the context of its general surrounding. Therefore, the locality is typically larger than the site and the areas adjacent to the site.

and Fish, 17-2-13)

- All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)
- All areas that provide or could potentially provide habitat for horned toads and bullfrogs as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, respectively)

2. Does the affected property contain land areas which were not listed in Question 1, but could be considered viable ecological habitat? The following are examples (but not a complete listing) of viable ecological habitats:

- Wooded areas
- Shrub/scrub vegetated areas
- Open fields (prairie)
- Other grassy areas
- Desert areas
- Any other areas which support wildlife and/or vegetation, excluding areas which support only opportunistic species (such as house mice, Norway rats, pigeons, etc.) that do not serve as prey to species in adjacent habitats.

The following features are <u>not</u> considered ecologically viable:

- Pavement
- Buildings
- Paved areas of roadways
- Paved/concrete equipment storage pads
- Paved manufacturing or process areas
- Other non-natural surface cover or structure

3. Does the affected property contain any perennial or ephemeral aquatic features which were not listed in Question 1?

II. Receptors

1. Is any part of the affected property used for habitat, foraging area, or refuge by any rare, threatened, or endangered species (plant *or* animal), or otherwise protected species (e.g., raptors, migratory birds)?

2. Is any part of the affected property used for habitat, foraging area, or refuge by any species used as a recreational (e.g., game animals) and/or commercial resource?

3. Is any part of the affected property used for habitat, foraging area, or refuge by any plant or animal species? This includes plants considered "weeds" and opportunistic insect and animal species (such as cockroaches and rats) if they are used as a food source for other species in the area.

III. Exposure Pathways

1. Could receptors be impacted by contaminants via direct contact?

   Is a receptor located in or using an area where it could contact contaminated air, soil[3], or surface water?

For Questions 2 and 3, note that one must answer "yes" to all three bullets in order to be directed to the "exclusion denied" box of the decision tree. This is because answering "no" to one of the questions in the bullet list indicates that a complete exposure pathway is not present. For example, in Question 2, if the chemical cannot leach or dissolve to groundwater (bullet 1), there is no chance of ecological receptors being exposed to the chemical through contact with contaminated groundwater. Similarly, the responses to the questions in Question 4 determine whether a complete pathway exists for exposure to NAPL.

2. Could receptors contact contaminants via groundwater?
   - Can the chemical leach or dissolve to groundwater[4]?
   - Can groundwater mobilize the chemical?
   - Could (does) contaminated groundwater discharge into known or potential receptor habitats?

3. Could receptors contact contaminants via runoff (i.e., surface water and/or suspended sediment) or erosion by water or wind?
   - Are chemicals present in surface soils?
   - Can the chemical be leached from or eroded with surface soils?
   - Is there a receptor habitat located downgradient of the leached/eroded surface soil?

---

3 For soil, this means contamination less than 5 feet below ground surface (bgs).

4 Information on the environmental fate of specific chemicals can be found on the Internet at *http://www.epa.gov/opptintr/chemfact/* or at a local library in published copies of the *Hazardous Substances Data Bank*.

4. Could receptors contact contaminants via migration of non-aqueous phase liquids (NAPL)?

- Is NAPL present at the site?
- Is NAPL migrating toward potential receptors or habitats?
- Could NAPL discharge impact receptors or habitats?

Figure 1 -Ecological Exclusion Criteria Decision Tree

(Refer to corresponding checklist for the full text of each question)

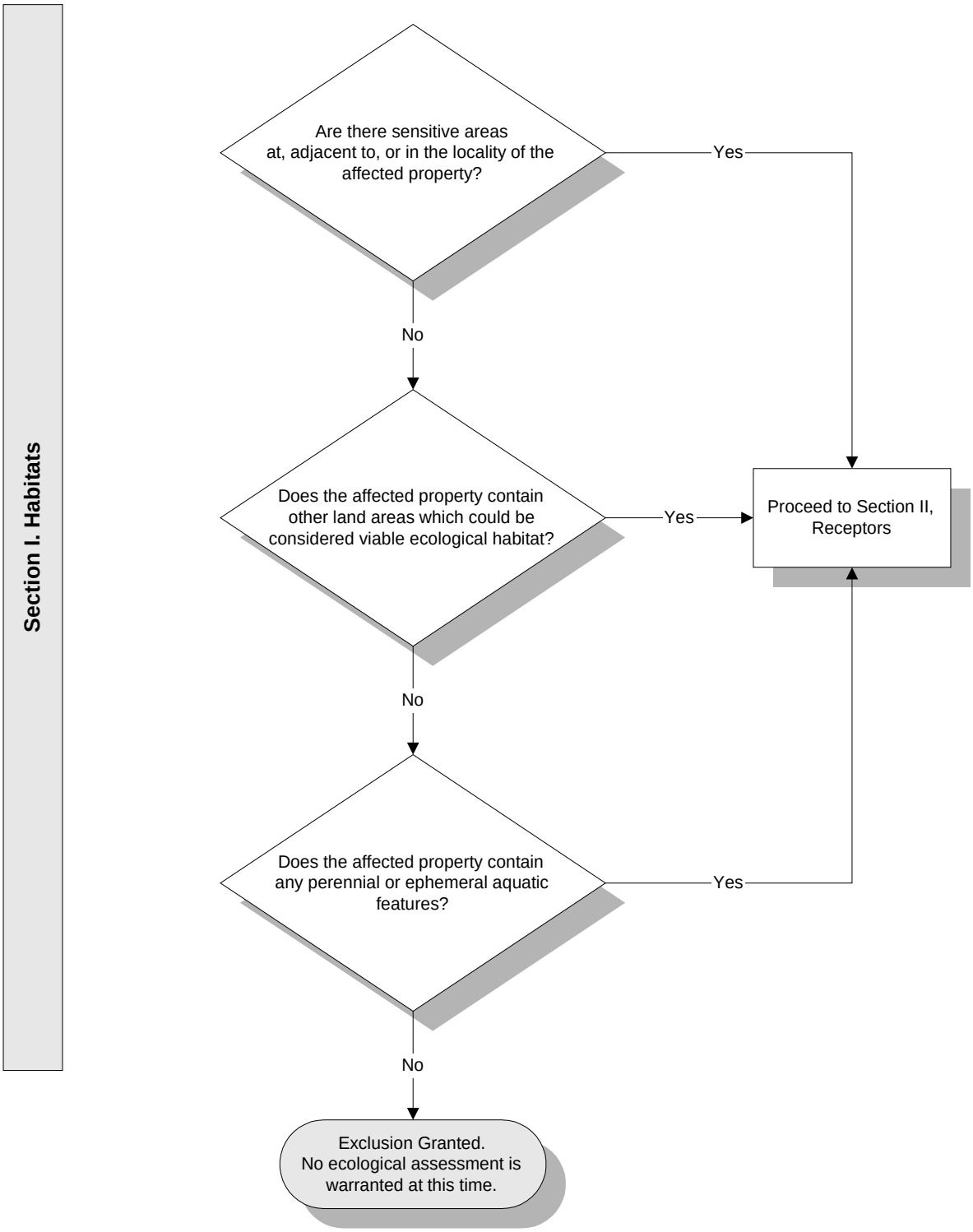


Figure 1 - Exclusion Criteria Decision Tree (continued)

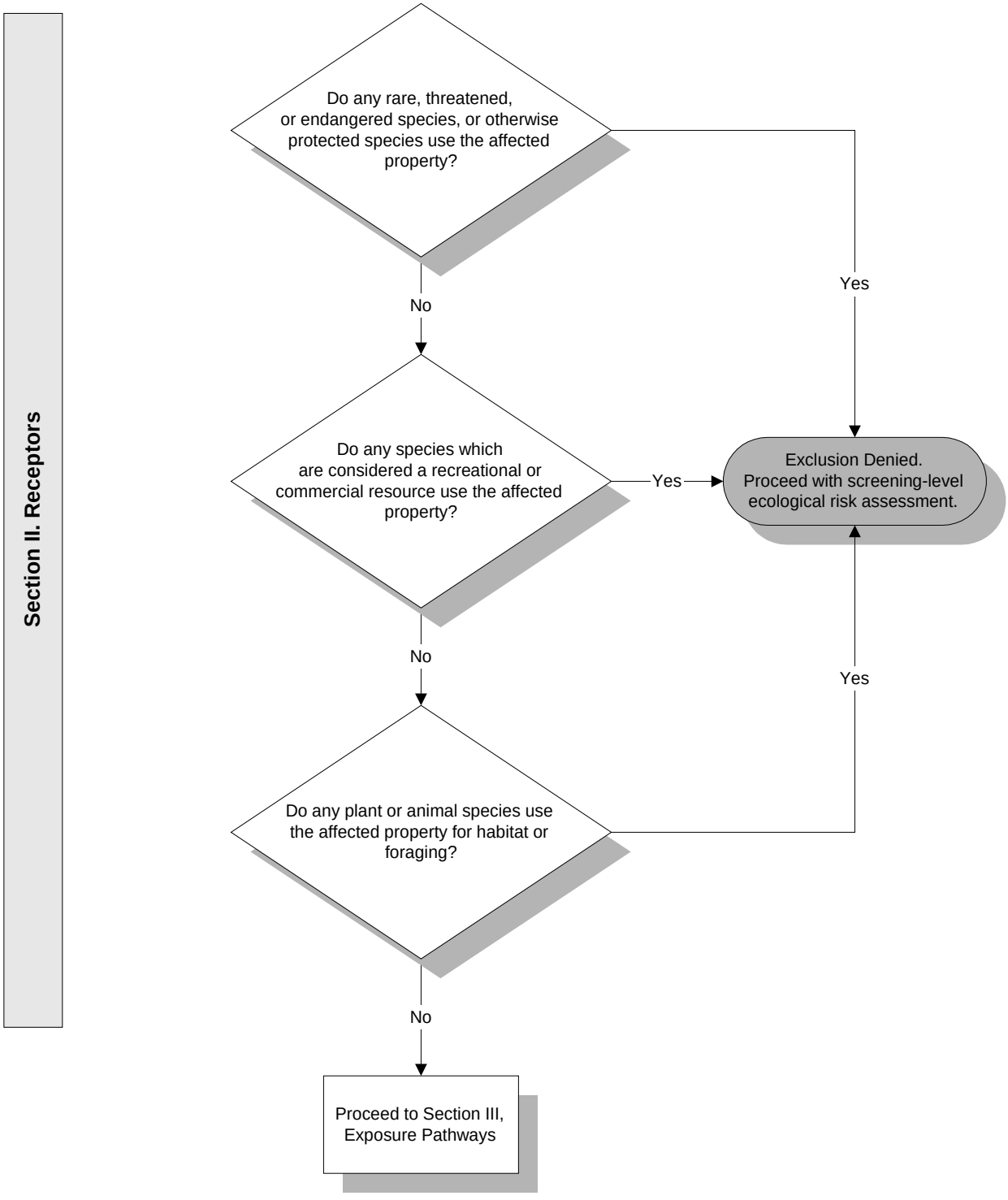


Figure 1 - Exclusion Criteria Decision Tree (continued)

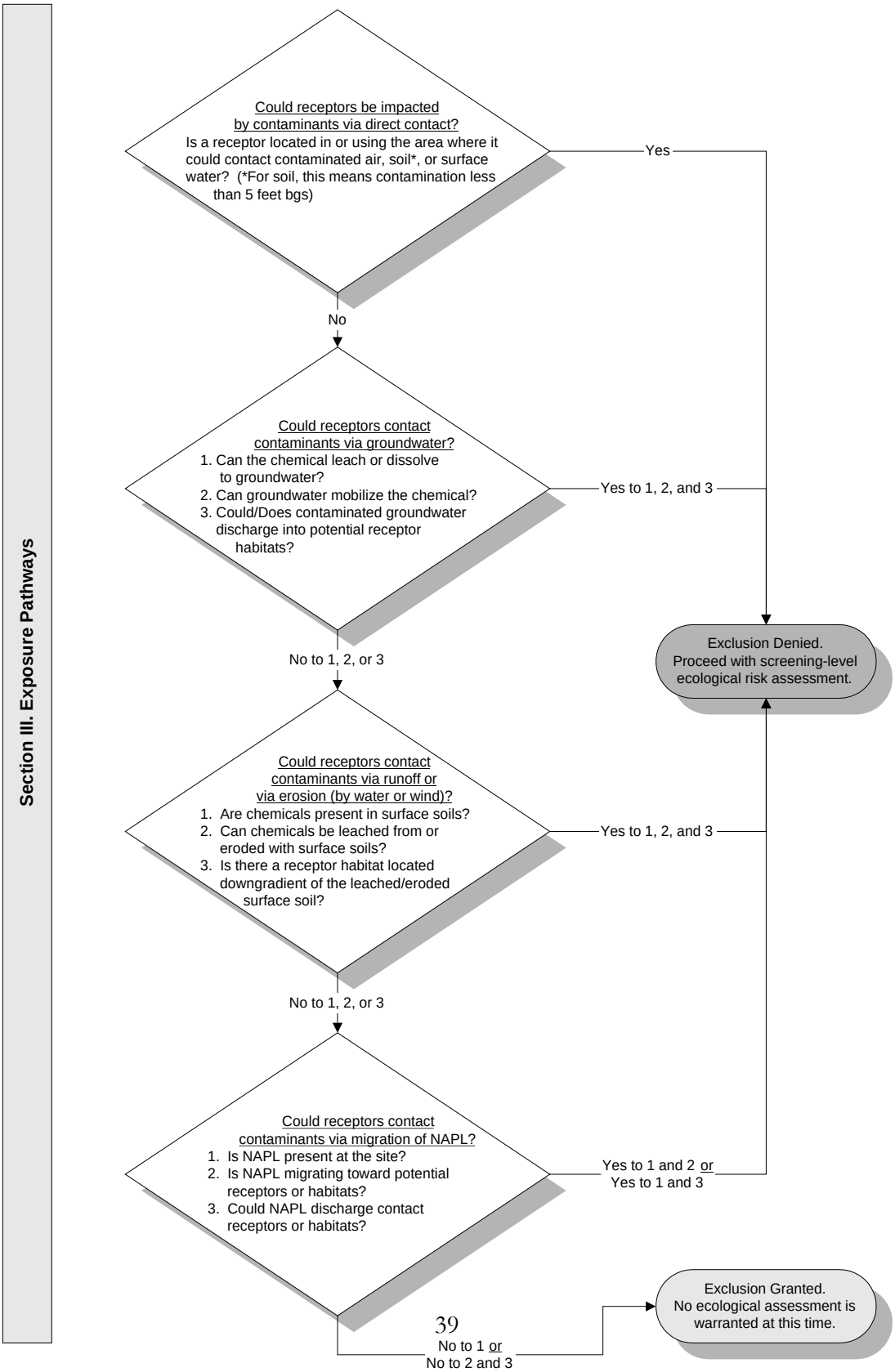


Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

Analyte		Sample Number	OTC536-IS-0001-062112		OTC536-IS-0003-062212		OTC536-IS-0004-062212-FD		OTC536-IS-0006-062212		OTC536-IS-0008-062212		OTC536-IS-0010-062212	
		Sample Date	6/21/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012		6/22/2012	
		Location	Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 4, leach field		Station 4, leach field	
		Depth (ft bgs)	3 - 5		7 - 9		7 - 9		3 - 5		3 - 5		0 - 2	
	Background Values - Soil (mg/kg)[a]	LANL (2012) ESLs (mg/kg)[b]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	**81.9**		**81.5**		**84.3**		**84.4**		**85.9**		**84**	
METALS (mg/kg)														
ALUMINUM	13722	pH Dependent	**3130**		**4680**		**4070**		**2640**	J	**5540**		**3020**	
ARSENIC	3.7	6.8 / 68	1.2	U	0.8	U	0.78	U	0.99	U	**1.2**	J	0.9	U
BARIUM	169.3	110 / 260	**42.9**	J	**72.8**	J	**38.6**	J	**26.1**	J	**47.1**	J	**36.2**	J
CALCIUM	317332	NSV	**208000**		**260000**		**219000**		**222000**	J	**202000**		**211000**	
CHROMIUM	25	28 / 280	**2.5**	J	**4.2**	J	**4.2**	J	**2.2**	J	**4.8**	J	**2.5**	J
COBALT	7.7	13 / 130	**1.3**	J	**1.5**	J	**1.3**	J	**0.9**	J	**1.8**	J	**1.2**	J
COPPER	13	15 / 46	**2.2**	J	**2**	J	**1.9**	J	**1.2**	J	**2.8**	J	**2.1**	J
IRON	23049	NSV	**2460**		**4400**		**3780**		**2410**		**4660**		**2440**	
LEAD	10.9	14 / 28	**0.78**	J	**2**	J	0.78	U	**1**	J	**4**	J	**2**	J
MAGNESIUM	16991	NSV	**3480**		**2850**		**2310**		**1680**	J	**3690**		**3480**	
MANGANESE	393	220 / 1,100	**47.5**		**99.9**		**61.4**		**31.7**		**82.9**		**47.2**	
NICKEL	17.4	9.7 / 19	**2.5**	J	**3.4**	J	**3**	J	**1.9**	J	**4**	J	**2.8**	J
POTASSIUM	5077	NSV	**1080**	J	**1200**	J	**1080**	J	**703**	J	**1500**	J	**971**	J
SODIUM	5196	NSV	**856**	J	440	U	430	U	540	U	570	U	**655**	J
VANADIUM	42.6	0.025 / 0.25	9.2	J	9.5	J	7.3	J	5.3	J	11.8	J	8.3	J
ZINC	54.6	48 / 480	**7.5**	J	**7.2**	J	**7.9**	J	**6.2**	J	**15.1**		**6.9**	J
PETROLEUM HYDROCARBONS (mg/kg)														
DIESEL RANGE ORGANICS C10-C28	NE	NE	4	U	4.1	U	4	U	**10.5**	J	**4.43**	J	3.9	U
OIL RANGE ORGANICS C28-C40	NE	NE	4	U	4.1	U	4	U	10.5		**5.07**	J	3.9	U

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1199 (OT-C536) RFI Report
Holloman Air Force Base, New Mexico

LANL (2012) ESL values represented as: No-Effect ESL / Low-Effect ESL (e.g., 6.8 / 68 for arsenic)

LANL (2012) ESL Exceeded

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] Los Alamos National Laboratory (LANL), 2012, ECORISK Database, LA-UR-12-24548, Release 3.1, October.

ft bgs = feet below ground surface

dup = duplicate sample

ft bgs = feet below ground surface

EPA = U.S. Environmental Protection Agency

HAFB = Holloman Air Force Base

J = estimated value

mg/kg = milligrams per kilogram

MW = monitoring well

NE = not established

NMED = New Mexico Environment Department

PCB = polychlorinated biphenyl

R = result rejected during data validation

RCRA = Resource Conservation Recovery Act

RFI = RCRA Facility Investigation

RSL = Regional Screening Level

SSL = Soil Screening Level

U = not detected at the detection limit shown

UJ = estimated nondetect

VQ = validation qualifier

Final

RCRA Facility Investigation Report
Group 1 – Building 1200 (OT-C537)
Holloman Air Force Base, New Mexico

Prepared for U.S. Air Force Civil Engineer Center
2261 Hughes Ave., Suite 155
Lackland Air Force Base, Texas 78236-9861

Prepared by Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

Contract No. FA8903-09-D-8580
Task Order No. 0013
Project No. 144106
Revision 0
October 2013

Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)

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Acronyms and Abbreviations

AFB	Air Force Base
bgs	below ground surface
COPC	constituent of potential concern
DPT	direct push technology
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
ft	foot/feet
GPR	ground-penetrating radar
GRO	gasoline range organics
HI	hazard index
IDW	investigation-derived waste
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MDL	method detection limit
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
ORO	oil range organics
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RSL	Regional Screening Level
Shaw	Shaw Environmental & Infrastructure, Inc. (a CB&I Company)
SLERA	screening-level ecological risk assessment
SSL	soil screening level
SVOC	semivolatile organic compound
TAL	target analyte list
TDS	total dissolved solids
TPH	total petroleum hydrocarbons
VOC	volatile organic compound
WQS	water quality standards

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1.0 INTRODUCTION

Shaw Environmental & Infrastructure, Inc. (Shaw), a CB&I company, has prepared this Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for the Air Force Civil Engineer Center (formerly the Air Force Center for Engineering and the Environment) under Contract No. FA8903-09-D-8580, Task Order No. 0013, Modification 01. Results presented in this report are from the investigation of the abandoned septic tank located at Building 1200 (OT-C537) at Holloman Air Force Base (AFB), New Mexico, which was one of the fifteen Group 1 septic tank sites under the Midwestern Region Performance-Based Remediation Contract. This RFI Report has been prepared pursuant to the requirements of the Holloman AFB Hazardous Waste Facility RCRA Permit No. NM6572124422 (the Permit) (New Mexico Environment Department [NMED], 2004). The purpose of this RFI was to delineate potential contamination that may have been released to the environment from the Building 1200 septic tank system.

Holloman AFB is situated in south-central New Mexico in the northwest central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). The 15 Group 1 former septic tank sites are located throughout Holloman AFB (Figure 1-2). Each former septic tank is associated with a specific building and is named in reference to the building, along with a numerical identification. As such, the 15 Group 1 septic tank systems are the following: OT-C530 (Building 308), OT-C531 (Buildings 920, 921, and 922), OT-C532 (Building 924), OT-C533 (Building 1190), OT-C534 (Building 1194), OT-C535 (Building 1196), OT-C536 (Building 1199), OT-C537 (Building 1200), OT-C538 (Building 1201), OT-C539 (Building 1221), OT-C540 (Building 1251), OT-C541 (Building 1269), OT-C542 (Building 1166), OT-C543 (Building 1175), and OT-C544 (Building 1176). This report presents a summary of the RFI work conducted at inactive septic tank OT-C533 at Building 1190.

Building 1200, historically known as the Space Biology Laboratory, was constructed in 1954 as one of several laboratories used for aeromedical research and is associated with the Primate Research Facility. The *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) report in Appendix A indicates that the building contained a lead-lined x-ray room, autopsy room, surgery room, dark room, and animal pens. During a site inspection conducted in 2007, it was discovered that the bathroom drain was separate from the work area drain and that all floor drains had been plugged. Abandonment records prepared by North Wind, Inc. state that rather than locating a septic tank at Building 1200, an earthen pit with a concrete cover was identified, and abandoned in place by backfilling the pit with clean fill (North Wind, Inc., 2008). Copies of the *Holloman AFB Septic Tanks* (U.S. Air Force, 2007) report, and abandonment records, are included in Appendix A.

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1.1 Purpose of the Investigation

Investigative activities were undertaken at Holloman AFB to determine the nature and extent of contamination, and propose recommendations for either closure or additional corrective action, if necessary, at 15 inactive, abandoned, or removed septic tank systems, following the general guidance for closing septic systems found in 20.7.3.307 New Mexico Administrative Code (NMAC) Standards – Abandoned Sewers and On-Site Liquid Waste Systems.

Project quality objectives for each septic tank site consisted of the following:

- Gather and review all site historical information
- Identify septic tank components and historical uses
- Remove septic tank contents and contaminated soil (where necessary), and abandon the tank (where necessary)
- Determine the nature and extent of residual constituents of concern at each site, including potential pathways to groundwater
- Evaluate the risk at each site
- Develop conclusions and recommendations for each site.

This RFI Report presents the data collected to meet these project quality objectives at the Building 1200 abandoned septic tank.

1.2 Scope of Activities

This RFI Report describes all activities associated with the septic tank investigation at Building 1200, including site layout, soil sampling, soil analysis, as-built mapping, and site surveying. The work was performed in accordance with the *Basewide Septic Tank Solid Waste Management Unit RFI Work Plan* (USACE, 2010) and the *Quality Program Plan* (Shaw, 2012a). The *Quality Program Plan* (Shaw, 2012a) contains the Site Safety and Health Plan; the Uniform Federal Policy–Sampling and Analysis Plan/Quality Assurance Project Plan; and the Construction Quality Plan, which defines the methodology and practices used to control construction work during the performance of the RFI.

1.3 Regulatory Setting

The Permit (NMED, 2004) establishes the general and specific standards and activities for managing hazardous waste pursuant to Subtitle C of RCRA, the New Mexico Hazardous Waste Act, and the New Mexico Hazardous Waste Management Regulations. The Permit

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also sets forth requirements for investigation, notification, corrective action, and reporting for the storage, management, and releases of hazardous wastes.

The 15 septic systems were either inactive, abandoned, or previously removed as indicated in *Holloman Air Force Base Septic Tanks* (provided in Appendix A), and were not listed in the Permit (NMED, 2004). The Holloman AFB *RFI Work Plan* (USACE, 2010) was approved by NMED in a letter dated January 13, 2010 (NMED, 2010). The NMED-approved *RFI Work Plan* (USACE, 2010) contained investigation activities only; therefore, Shaw submitted a *Final Voluntary Corrective Measure Request – Septic Tanks Sites* (Shaw, 2012b) to include remediation and closure tasks that address septic system abandonment using 20.7.3.307 NMAC (Abandoned Sewers and On-Site Liquid Waste Systems). NMED has primary regulatory responsibility for the septic system sites; therefore, corrective action must be performed under Title 20 NMAC.

The septic tank investigation was based on action/cleanup levels stipulated in Appendix 4-F of the Permit to be protective of human health and the environment. The Permit Appendix 4-F specifies that soil contaminant concentrations be compared with the NMED residential soil screening levels (SSL), as presented in the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a) or the U.S. Environmental Protection Agency (EPA) Regional Screening Levels (RSLs) as presented in the *U.S. Environmental Protection Agency (EPA) Regions 3, 6, and 9 Regional Screening Levels for Chemical Contaminants at Superfund Sites* (EPA, 2012a), when no NMED SSL has been established. Holloman AFB also has NMED-approved background concentrations for metals in soil (NMED, 2012b).

For groundwater, the Permit specifies that the more stringent of either the New Mexico Water Quality Control Commission (NMWQCC) water quality standards (WQS) (20.6.2 NMAC), or the EPA drinking water maximum contaminant levels, be used for comparison with measured sample concentrations (EPA, 2012b).

1.4 RFI Report Organization

This RFI Report is organized into the following sections:

- **Section 1.0, Introduction**: identifies the objectives and purpose of this report.
- **Section 2.0, Environmental Setting**: provides pertinent descriptions of history, location, physiography, topography, surface water, hydrology, regional geology, soil types, regional hydrogeology, climate, current and future land use, and current and future water use for Holloman AFB.

- **Section 3.0, Source Characterization**: presents the data collection and locations, as well as analytical methods.
- **Section 4.0, Investigation Results and Evaluation**: details the soil analytical results, and provides the human health and ecological evaluations.
- **Section 5.0, Data Quality Assurance and Data Quality Control Review**: summarizes the analytical data validation results.
- **Section 6.0, Conclusions and Recommendations**: presents the conclusions and recommendations of this RFI report.
- **Section 7.0, References**: lists the references cited in this report.

In addition to the figures and tables listed in the table of contents, the following appendices are included in this report:

- **Appendix A** – Historical Records
- **Appendix B** – Photographic Log
- **Appendix C** – Geophysical Report
- **Appendix D** – Sample Collection Logs
- **Appendix E** – Boring Logs
- **Appendix F** – Site Survey Data
- **Appendix G** – Laboratory Analytical Data and Data Validation Checklists
- **Appendix H** – Waste Manifests
- **Appendix I** – Risk Evaluation Calculations
- **Appendix J** – Ecological Evaluation.

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2.0 ENVIRONMENTAL SETTING

This section provides background information for Holloman AFB including physical setting, history, topography, climate, soils, geology, hydrology, and land and water use.

2.1 Physical Setting

Holloman AFB is situated in south-central New Mexico, in the northwest-central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). Holloman AFB has a population of 6,000, and occupies 59,639 acres in the northeast quarter of Section 1, Township 17 South, Range 8 East. The White Sands Missile Range testing facilities occupy additional land extending northward from the base. Privately- and publicly-owned lands border the remainder of Holloman AFB. The major highway servicing Holloman AFB is Highway 70, which runs southwest from the town of Alamogordo, New Mexico, and separates Holloman AFB from publicly owned lands to the south. Alamogordo, New Mexico, which has a population of 30,401 according to the 2010 U.S. Census, is located approximately 7 miles east of the base.

2.2 Holloman Air Force Base History

Holloman AFB was first established in 1942 as Alamogordo Army Air Field. From 1942 through 1945, Alamogordo Army Air Field served as the training grounds for over 20 different flight groups, flying primarily B-17s, B-24s, and B-29s. After World War II, most operations had ceased at the base. In 1947, Air Material Command announced the air field would be its primary site for the testing and development of unmanned aircraft, guided missiles, and other research programs. On January 13, 1948, the Alamogordo installation was renamed in honor of the late Colonel George V. Holloman, a pioneer in guided missile research. In 1968, the 49th Tactical Fighter Wing arrived at Holloman AFB, and has remained since. Today, Holloman AFB also serves as the training center for the German Air Force's Tactical Training Center.

2.3 Physiography and Topography

Holloman AFB is located within the Sacramento Mountains physiographic province on the western edge of the Sacramento Mountains. The base is approximately 59,600 acres in area, and is located at a mean elevation of 4,093 feet (ft) above mean sea level. The region is characterized by high tablelands with rolling summit plains; cuesta-formed mountains dipping eastward; and west-facing escarpments, with the wide bracketed basin forming the basin and range complex. Holloman AFB is located in the Tularosa Basin, which is part of the Central Closed Basins. The bordering mountains rise abruptly to altitudes of 7,000 to 12,000 ft above mean sea level. The San Andres Mountains bound the basin to the west

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(approximately 30 miles) with the Sacramento Mountains approximately 10 miles to the east (Figure 2-1). At its widest, the basin is approximately 60 miles east to west, and stretches approximately 150 miles north to south.

2.4 Climate

As a whole, New Mexico has a mild, arid to semiarid continental climate characterized by light precipitation totals, abundant sunshine, relatively low humidity, and relatively large annual and diurnal temperature ranges (Western Regional Climate Center, 2013). The climate of the Central Closed Basins varies with elevation. The base is located in the low areas and is characterized by warm temperatures and dry air. Daytime temperatures often exceed 100 degrees Fahrenheit in the summer months, and are in the middle 50s degrees Fahrenheit in the winter. A preponderance of clear skies and relatively low humidity permits rapid nighttime cooling resulting in average diurnal temperature ranges of 25 to 35 degrees Fahrenheit. Potential evapotranspiration, at 67 inches per year, significantly exceeds annual precipitation, usually less than 15 inches. Arid conditions resulting from very low rainfall amounts, coupled with the topographically induced wind patterns combining with the sparse vegetation, tend to cause localized “dust devils.” The annual rainfall for Alamogordo, New Mexico is 12 inches per year. Much of the precipitation falls during the midsummer monsoonal period (July and August) as brief, yet frequent, intense thunderstorms culminating in 30 to 40 percent of the total annual rainfall.

2.5 Regional Geology and Soils

2.5.1 Geology

The sedimentary rocks that make up the adjacent mountain ranges are between 250 and 500 million years old (New Mexico Bureau of Geology and Mineral Resources, 2012). During the period when the area was submerged beneath the shallow intracontinental sea, the layers of limestone, shale, gypsum, and sandstone were formed. In time, these layers were pushed upward through various tectonic forces forming a large bulge on the surface. Approximately 10 million years ago, the center began to subside resulting in a vertical drop of thousands of feet, leaving the edges still standing (the present-day Sacramento and San Andres mountain ranges). In the millions of years following, rainfall, snowmelt, and wind eroded the mountain sediments depositing them in the valley (i.e., Tularosa Basin). Water carrying eroded limestone, dolomite, gravel, and other materials continue to flow into the basin.

As the Tularosa Basin is a bolson, which is a basin with no surface drainage outlet, sediments carried by surface water into a closed basin are bolson deposits. The overlying alluvium generally consists of unconsolidated gravels, sands, and clays. Soils in the basin are derived from the adjacent ranges as erosional deposits of limestone, dolomite, and gypsum. A fining

sequence from the ranges towards the basin's center characterizes the area with the near-surface soils as alluvial, eolian, and lacustrine deposits. The alluvial fan deposits are laterally discontinuous units of interbedded sand, silt, and clay while the eolian deposits consist primarily of gypsum sands. The eolian and alluvial deposits are usually indistinguishable due to the reworking of the alluvial sediment by eolian processes. The playa, or lacustrine deposits, consist of clay containing gypsum and are contiguous with the alluvial fan and eolian deposits throughout the base. Stiff caliche layers, varying in thickness, have been identified at different areas of the base.

2.5.2 Soils

The U.S. Natural Resources Conservation Service (formerly the Soil Conservation Service) has identified two soil associations in the vicinity of Holloman AFB: (1) the Holloman-Gypsum Land-Yesum Complex, and (2) the Mead silty clay loam (Figure 2-2) (U.S. Department of Agriculture, 1981). The permeability of these horizons ranges from 4×10^{-4} to 1×10^{-3} centimeters per second.

The Holloman-Gypsum Land-Yesum Complex, 0 to 5 percent sloped soil, consists of larger areas of shallow and deep, well-drained soils and areas of exposed gypsum. The Holloman soil makes up approximately 35 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 13 inches of the substratum is pink, very fine sandy loam that is very high in gypsum. Below that, the substratum is white gypsum to a depth of more than 60 inches. This soil is calcareous and mildly alkaline to moderately alkaline. Permeability is moderate. Available water capacity is very low.

Gypsum Land makes up approximately 30 percent of the Holloman-Gypsum Land-Yesum Complex (0 to 5 percent slopes). Typically, less than 1 inch of very fine sandy loam overlies soft to hard, white gypsum. The deep Yesum consists of very fine sandy loam that makes up approximately 20 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 9 inches of the substratum is light brown, fine sandy loam that is very high in gypsum. Below that, the substratum is pink, very fine sandy loam to a depth of more than 60 inches. The soil is calcareous throughout, and is mildly alkaline. Permeability is moderate. Available water capacity is moderate. Many fine gypsum crystals are found throughout the profile.

The soil type found across the main drainage area for the installation is Mead silty clay loam, 0 to 1 percent slopes. This deep, poorly drained, nearly level soil is on outer fringes of alluvial fans. This soil formed in fine textured alluvium over lacustrine lake sediment. It is very high in salt content because of periodic flooding and poor drainage. Slopes are smooth and concave. Typically, the surface layer is reddish brown, silty clay loam, and clay loam

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approximately 5 inches thick. The substratum, to a depth of 48 inches, is light reddish brown clay that has a high content of salt. Below that, the substratum is lacustrine material of variable texture and color to a depth of more than 60 inches. Included within this soil are areas of Holloman soils and Gypsum Land along the margins of the unit of steep, short gully sides and knolls. These inclusions make up approximately 15 percent of the map unit for this soil type. Individual areas are generally smaller than 10 acres. This soil is moderately calcareous throughout and is moderately to strongly alkaline. It has a layer of salt that is more soluble than gypsum. Permeability is very low. Available water capacity is low (USACE, 2010).

2.6 Regional Hydrogeology

Groundwater occurs as an unconfined aquifer in the unconsolidated deposits of the central basin, with the primary source of recharge as rainfall percolation and minor amounts of stream runoff along the western edge of the Sacramento Mountains. Surface water/rainfall migrates downward into the alluvial sediments at the edge of the shallow aquifer near the ranges and flows through progressively finer-grained sediments towards the central basin. Because the Tularosa Basin is a closed system, water that enters the area leaves either through evaporation or percolation. This elevated amount of percolation results in a fairly high water table. Beneath Holloman AFB, groundwater ranges from 5 to 50 ft below ground surface (bgs). Flow for the base is generally towards the southwest with localized influences from the variations in the topography of the base (Figure 2-3). In the northern and western portions of the base, groundwater flows more to the west towards the Ritas Draw, Malone Draw, and Lost River drainages. Groundwater flow is affected by local topography in areas immediately adjacent to arroyos, where groundwater flows directly toward the drainages regardless of the regional flow pattern.

Groundwater in the Tularosa Basin is of potable quality at the recharge areas in close proximity to the Sacramento Mountains and becomes increasingly mineralized toward the central portion of the basin and discharge areas. The majority (over 70 percent) of the Environmental Restoration Program sites located across Holloman AFB have groundwater monitoring wells containing water with an average total dissolved solids (TDS) concentration greater than 10,000 milligrams per liter (mg/L). These TDS data support the hypothesis that TDS concentrations below 10,000 mg/L at Holloman AFB are caused by dilution of natural groundwater quality from leaking water lines and surface irrigation from the domestic water supply. TDS concentrations greater than 10,000 mg/L exceed the NMWQCC limit as potable water (20.6.2 NMAC), and thus, the groundwater beneath Holloman AFB has been designated as unfit for human consumption. Likewise, the EPA guidelines have identified the groundwater as a Class IIIB water source, characterized by TDS concentrations exceeding 10,000 mg/L, and is characterized by a low degree of

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interconnection with adjacent surface water or groundwater of a higher class. Groundwater does not discharge or connect to any adjacent aquifers, because the Tularosa Basin is a closed basin. Adjacent surface waters include Lost River and Lake Holloman, which also have high concentrations of TDS, and are not considered potential drinking water sources.

2.7 Surface Water and Hydrology

The Tularosa Basin contains all of the surface flow in its boundaries. The nearest inflow of surface waters to Holloman AFB comes from the Lost River, located in the north-central region of the base. The upper reaches of the Three Rivers and the Sacramento River are perennial in the basin. Holloman AFB is dissected by several southwest-trending arroyos that control the surface drainage. Hay Draw arroyo is located in the far north. Malone and Ritas Draws, which drain into the Lost River and Dillard Draw arroyos, are located along the eastern perimeter of the base. Approximately 10,000 years ago, indications are that a much wetter climate existed. The present-day Lake Otero encompassed a much larger area, possibly upwards of several hundred square miles. Its remains are the Alkali Flat and Lake Lucero. Lake Lucero is a temporary feature of merely a few inches in depth during the rainy season.

Ancient lakes and streams deposited water-bearing deposits over the older bedrock basement materials. Fractures, cracks, and fissures in the Permian and Pennsylvanian bedrock yield small quantities of relatively good-quality water in the deeper peripheral. Potable water is only found from wells near the edges of the basin, with more saline water towards the center. Two of the principal sources of potable water are: (1) a long narrow area on the upslope sides of Tularosa and Alamogordo, and (2) in the far southwestern part of the basin. A portion of the city of Alamogordo's water, as well as Holloman AFB's water, is supplied from Bonito Lake (which is in the Pecos River Basin).

2.8 Current and Future Land Use

The land surrounding Holloman AFB consists of residential areas to the east and northeast (city of Alamogordo), rangeland to the south, the White Sands National Monument to the west, and areas where military activities are conducted to the north. The desert terrain of the area immediately surrounding Holloman AFB has limited development, and there are no agricultural operations, residential communities, or large industrial operations located adjacent to the base. The Boles Well Field, a freshwater source for Holloman AFB, is located approximately 6 miles to the southeast of the base. Holloman AFB is an active military installation and is expected to remain active for the foreseeable future. No transfer of military property to the public is anticipated, and public access to the base is restricted. Future land use is not expected to differ significantly from current land use practices (Foster Wheeler Environmental Corporation, 2002).

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2.9 Current and Future Water Use

At present, Holloman AFB receives approximately 50 percent of its freshwater supply from the Boles Well Field. An additional freshwater resource for Holloman AFB, and for the city of Alamogordo, is Bonito Lake, located 60 miles northeast of the Tularosa Basin. Currently, there are no potable supplies of groundwater or surface water located on the base because of poor groundwater quality with TDS concentrations greater than 10,000 mg/L.

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3.0 SOURCE CHARACTERIZATION

This section presents the overall technical approach in general accordance with the *RFI Work Plan*, (USACE, 2010) (except where otherwise noted), and details the investigative activities that were implemented at Building 1200.

The primary environmental media of concern at Building 1200 are soil and groundwater. The extent of contamination in soil was expected to be relatively local to the abandoned septic tank location. Therefore, the basic approach was to identify the abandoned septic tank location and then work outward from the location in identifying contaminated soil. To evaluate the potential impacts to groundwater, a monitoring well was planned for installation in the leach field of each inactive, abandoned, or removed septic tank. The analytical programs for both soil and groundwater focused on the expected nature of contamination likely to be associated with septic tank discharges.

The RFI conducted at abandoned septic tank OT-C537 (Building 1200) was initiated as part of the Midwestern Region Performance-Based Remediation Contract. Under the *RFI Work Plan* (USACE, 2010) for this site, field activities included: pre-mobilization, mobilization, and site setup activities (under which a geophysical investigation was performed); soil boring advancement; soil sample collection and analysis; investigation-derived waste (IDW) management; and land surveying. Appendix B presents a photographic log of various Building 1200 investigative activities.

3.1 Pre-mobilization/Mobilization Activities

As a part of the premobilization and mobilization phase of the work, the following pre-investigation documents were filed and approvals obtained:

- Civil Engineer Work Request (Air Force Form 332) approval
- Base digging permits (Air Force Form 103, Base Civil Engineering Work Clearance Request) with utility clearances
- Site security clearances
- Facility manager notification of the intended operations.

Before the start of site work activities, a pre-investigation kick-off meeting and site walk-through were conducted with the Air Force Civil Engineer Center resident engineer, Holloman AFB personnel, and Shaw's Construction Manager. These meetings facilitated planning for equipment access, equipment staging, decontamination area layout, potential site hazards, emergency evacuation routes, and project schedule.

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Prior to the submittal of the base digging permits, the drilling locations were delineated using marker flags, stakes, and paint. Utility clearance approvals were completed by the appropriate Holloman AFB utility office (i.e., telephone, sewer, water, natural gas, etc.), and by the New Mexico One Call utility clearance system. Upon receipt of the approved digging permit and utility clearances, Shaw's Construction Manager completed a site walk-through to confirm the utility and intrusive work locations. In addition, Shaw performed a site survey prior to the start of drilling activities to search for signs of other buried or overhead utilities.

3.2 Geophysical Investigation

A geophysical investigation was performed at Building 1200 to locate the position and to define the limits of the abandoned septic system. Methods employed included: visual inspection, electromagnetic induction conductivity detection, ground-penetrating radar (GPR), and electromagnetic pipe and cable location.

Electromagnetic induction conductivity detection ground induction methods are employed to detect broad metal mass anomalies or conductive zones that may be indicative of potential septic tanks, and lateral changes in conductive zones of soil or backfill materials relative to native soil. GPR is used to detect abandoned septic tank excavation sidewalls and fill areas. An electromagnetic pipe and cable survey was conducted to detect buried utility lines.

Electromagnetic and GPR surveys were conducted at Building 1200 on June 16, 2012. Influent piping and the location of the abandoned septic tank/earthen pit (as described by North Wind, Inc. in 2008) were identified north of the chain link fence surrounding the area. Neither effluent piping nor a leach field (or leach field drain line piping) associated with the septic tank/earthen pit were identified during the geophysical surveys. Geophysical findings are shown on Figure 3-1. The complete geophysical report is included in Appendix C.

3.3 Soil Investigation

The soil investigation of the abandoned septic tank/earthen pit at Building 1200 was conducted on July 16, 2012. Because there was no effluent piping or leach field identified during the geophysical surveys, the soil investigation consisted of sampling three borings advanced at the abandoned septic tank/earthen pit location, as shown on Figure 3-1. Soil boring OTC537-Station 1 (sample numbers OTC537-IS-0001-071612 and OTC537-IS-0002-071612) was placed north of the abandoned septic tank/earthen pit near the influent line, OTC537-Station 2 (sample numbers OTC537-IS-0003-071612 and OTC537-IS-0004-071612) was placed at the abandoned septic tank/earthen pit location, and OT-C537-Station 3 (samples numbers OTC537-IS-0005-071612, OTC537-IS-0006-071612, and OTC537-IS-0007-071612FD) was placed south of the abandoned septic tank /earthen pit. All borings were advanced using direct push technology (DPT), with soil samples collected at

depths of 3.0 to 5.0 ft bgs and 10.0 to 12.0 ft bgs at OTC537-Station 1; and 7.0 to 9.0 ft bgs and 14.0 to 16.0 ft bgs at OTC537-Station 2; and 3.0 to 5.0 ft bgs and 10.0 to 12.0 ft bgs at OTC537-Station 3. Copies of the sample collection logs are provided in Appendix D. A field duplicate was collected from the 10.0 to 12.0 ft bgs depth interval at Station 3.

Soil samples were logged in the field in accordance with the Unified Soil Classification System requirements, and sample depths were in general accordance with the *RFI Work Plan* (USACE, 2010). Soil samples were not screened with a photoionization detector since there was no sensory evidence of contamination. Appendix E contains copies of the soil boring logs.

Soil samples for volatile organic compound (VOC) analysis were collected in accordance with EPA Method 5035, using a TerraCore® Sampler device (EPA, 1986), while non-VOC sample aliquots were placed in laboratory-provided containers. Samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), explosives, polychlorinated biphenyls (PCBs), target analyte list (TAL) metals, total petroleum hydrocarbons (TPH)-gasoline range organics (GRO), TPH-diesel range organics (DRO), TPH-oil range organics (ORO), cyanide, percent solids, and tritium by Accutest Laboratories, Inc., a National Environmental Laboratory Accreditation Program-accredited laboratory, using EPA analytical methods, as summarized on Table 3-1.

The excess sample core soil extracted using the DPT drilling method was placed in 55-gallon drums for later characterization and transport to a licensed disposal facility. The boreholes were abandoned upon completion by plugging from the bottom of the borehole to ground surface using bentonite pellets. Soil boring equipment was decontaminated between borings as detailed in Holloman AFB Standard Operating Procedure 2, "Sampling Equipment Decontamination" as provided in Appendix B of the *RFI Work Plan* (USACE, 2010) and Shaw's Standard Operating Procedure No. EI-FS-014, "Decontamination of Contact Sampling Equipment."

3.4 Groundwater Investigation

The groundwater investigation at the Building 1200 former septic tank location indicated no groundwater present in the any of the soil borings. As a result, a monitoring well was not installed, and groundwater sampling was not performed.

3.5 Investigation-Derived Waste

The nonhazardous IDW generated during the RFI at Building 1200 (OT-C537) was segregated into the following categories:

- Soil – drill cuttings soil

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- Water – decontamination liquids.

Upon generation, IDW was properly containerized and temporarily stored at the designated laydown yard, as specified by Holloman AFB. Wastes were contained in sealed, U.S. Department of Transportation–approved, steel 55-gallon drums (for soil cuttings and decontamination water), roll-off containers with liners and covers (for excavated waste soil), and a 1,400-gallon plastic tank (for waste water). The waste soil drums were emptied into 20-cubic-yard roll-off containers, and the waste water was pumped into a bulk plastic tank prior to characterization sampling and analysis for disposal. The drill cuttings from the Building 1200 site were placed into the 20-cubic-yard roll-off containers along with soils from other Holloman AFB investigation sites.

3.6 Site Surveying

Soil borings and other site features shown on Figure 3-1 were surveyed by Albuquerque Surveying Company, Inc. from Albuquerque, New Mexico, a state-licensed surveyor.

Horizontal coordinates are referenced to the North American Datum 1983 State Plane Coordinate System, New Mexico-Central, and surveyed to an accuracy of $\pm$1.0 ft. Vertical elevations are referenced to the North American Vertical Datum 1988 coordinate system to an accuracy of $\pm$0.01 ft. A copy of the survey results is presented in Appendix F.

3.7 Decontamination Procedures

A decontamination pad was constructed at the designated laydown area for decontamination of all downhole drilling equipment. The drilling rig was decontaminated prior to entering the site. Drilling equipment that came into contact with the borehole was decontaminated by hot-water pressure washing. Disposable equipment used for soil sample collection did not require decontamination.

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4.0 INVESTIGATION RESULTS AND EVALUATION

Soil analytical results presented in this section were used to delineate constituents of concern that may have been released to the environment, and confirm that no additional remedial measures are required.

4.1 Soil Analytical Results

DPT soil boring samples were collected during the Building 1200 RFI, at the locations shown on Figure 3-1. All soil samples were sent to Accutest Laboratories, Inc., for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium analyses. Analytical results for the soil samples are presented in Table 4-1. Laboratory analytical data packages, and the data validation checklists for the soil sample data, are provided in Appendix G.

The analytical results for metals in Table 4-1 show that Holloman AFB soil samples contain significant amounts of calcium, typically greater than 100,000 milligrams per kilogram (mg/kg) (10 percent), and can be as high as 250,000 mg/kg (25 percent). Calcium at these levels contributes spectral interferences during inductively coupled plasma metals analysis, and can also clog the nebulizer that is used to introduce the sample. Sample dilution is the recommended method for solving both the spectral interference issue and the nebulizer clogging issue. However, sample dilution raises the analytical method detection limits (MDLs) for all associated metals, including thallium.

A typical method detection limit for thallium during inductively-coupled plasma analysis is 0.13 mg/kg. Diluting by a factor of 5 to 20 to eliminate calcium spectral interference and nebulizer clogging causes the thallium detection limit to be elevated by a factor of 5 to 20. This results in a MDL that is above the NMED residential SSL of 0.782 mg/kg thallium. Consequently, the required remedy to allow for proper equipment operation resulted in MDLs that were above the NMED residential SSL. However, thallium is not an element that is anticipated to be present at Building 1200 as a result of normal septic tank operation and maintenance.

The validated soil analytical results were compared with the NMED SSLs (NMED, 2012a), or the EPA RSLs (EPA, 2012a), if an NMED residential SSL was not established for a given analyte. In addition, a TPH screening level of 1,000 mg/kg was used to evaluate the laboratory analytical data. The 1,000 mg/kg action level for petroleum-contaminated soil is the Residential Direct Exposure Limit for unknown oil, listed in Table 6-2, TPH Screening Guidelines for Potable Groundwater, of the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a).

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No soil samples had detections above the NMED residential SSLs in any of the soil samples collected at Building 1200. Additionally, all soil samples from all locations and depths were non-detect for PCBs, cyanide, tritium, and TPH-GRO, TPH-DRO, and TPH-ORO.

Sample OTC537-IS-0004-071612, collected from OT-C537 Station 2 in the 14 to 16 ft bgs interval, had a mercury concentration (0.047 mg/kg) above the Holloman soil background value of 0.0108 mg/kg. All other parameters were below the background values.

4.2 Groundwater Analytical Results

The groundwater investigation at the Building 1200 former septic tank location indicated no groundwater present in the any of the soil borings. As a result, a monitoring well was not installed and groundwater sampling was not performed. The ephemeral nature of shallow groundwater at Building 1200 was observed at numerous other sites during the Holloman AFB RFIs, and lends uncertainty as to the reliability of the shallow groundwater (upper water table) as a water source. Furthermore, as stated in Section 3.2.4.2 of the *RFI Work Plan* (USACE, 2010) groundwater may not require testing if it is determined that limited impacts to the soil column have been realized from the septic tanks leach field. As stated in Section 4.1, there were no constituents detected in soil above NMED residential SSLs.

4.3 Investigation-Derived Waste Analytical Results

A bulk waste characterization sample (LDY-IDW-01-090412) was collected from the bulk waste soil and analyzed for Toxicity Characteristic Leaching Procedure VOCs, SVOCs, and RCRA metals. The results are presented in Table 4-2. None of the waste soil analytical results were above the 40 Code of Federal Regulations Part 261.24 limits. The waste soil was managed as nonhazardous waste and was subsequently transported to Otero/Greentree Regional Landfill, Alamogordo, New Mexico for disposal (Waste Manifest in Appendix H).

The wastewater from equipment decontamination was sampled and analyzed for VOCs, SVOCs, TAL metals, TPH-GRO, TPH-DRO, and TPH-ORO, with the analytical results presented in Table 4-3. The analytical results were reviewed by the Holloman AFB wastewater treatment plant personnel, and subsequently accepted for disposal.

4.4 Risk-Based Evaluation

4.4.1 Soil

Seven soil samples were collected at Building 1200, from depths of 0.0 to 16.0 ft bgs, during the abandoned septic tank/earthen pit investigation. Per NMED (2012a), the soil depths of interest for a risk evaluation are 0.0 to 10.0 ft bgs for construction workers and residential receptors, and 0.0 to 1.0 ft bgs for commercial/industrial workers. Therefore, results from the screening assessment (Table 4-1) that present data for 0.0 to 10 ft bgs were used for the Risk

Evaluation. Based on the results of the initial screening evaluation, no constituents of potential concern (COPCs) have a concentration greater than: (1) NMED residential SSLs or (2) EPA residential RSLs (if NMED values have not been established). Total cancer risk ratios and total hazard ratios (hazard index [HI]) to address potential additive toxicological effects were also assessed (per NMED 2012a, Section 5.0). This was conducted by using maximum detected concentrations of carcinogens and non-carcinogens, estimating risk and hazard ratios, and scaling a total cancer risk and total HI. The total cancer risk did not exceed 1.0×10^{-5} (total cancer risk: 3.3×10^{-6}), as shown in Appendix I. The total HI based on maximum detected concentrations was equal to 0.32 (as shown in Appendix I). As the target HI is 1.0, this is acceptable because the HI does not exceed 1.0.

Therefore, as no COPCs were selected for soil, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not health risks.

4.4.2 Groundwater

The groundwater investigation at the Building 1200 former septic tank location indicated no groundwater present in the any of the soil borings. As a result, a monitoring well was not installed, groundwater was not sampled, and a risk evaluation was not performed.

4.4.3 Risk-Based Conclusions

No COPCs were selected for soil as no constituents were greater than screening levels. Therefore, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not a health risk. Additionally, total cancer risks and non-cancer hazards in soil were acceptable.

No risk evaluation was performed for groundwater, as no groundwater was encountered at this site during the field investigation.

4.5 Ecological Evaluation

The former septic system at Building 1200 was located in a graveled, flat-lying area that served as part of the yard for the building and is now moderately vegetated, as shown in the photographic log in Appendix B. As such, a screening-level ecological risk assessment (SLERA) Scoping Assessment Site Assessment Checklist was completed for the Building 1200 (OT-C537) septic tank system, and is included in Appendix J. Results of the checklist Exclusion Criteria Decision Tree indicate that the site is a potential viable ecological habitat, and a potential exposure pathway exists for soil. Therefore, a SLERA was performed for the Building 1200 site.

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Soil data results from 0 to 10 ft bgs were included in the comparison and are provided in Table A of Appendix J. According to NMED (2012c), this is the potential depth of interest for wildlife, including burrowing animals. As shown in Table A (Appendix J), three soil samples were available within the 0 to 10 ft bgs zone. Detected constituents in soil included 16 metals. All other constituents analyzed for were non-detects.

Metals concentrations were compared to Holloman AFB soil background values (Table A, Appendix J). Detected concentrations of metals did not exceed Holloman AFB soil background values in any soil samples evaluated from 0 to 10 ft bgs. Therefore, no further evaluation was performed for metals.

Since all detected site concentrations of metals are below their respective background screening values in soil from 0 to 10 ft bgs, it is concluded that risks to the ecological system at and surrounding the site are acceptable.

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5.0 DATA QUALITY ASSURANCE AND DATA QUALITY CONTROL REVIEW

All analytical data was reviewed in accordance with EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA, 2004a) and the EPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (EPA, 2004b). Data qualifiers were added to the database prior to project use. The data tables provided in Section 4.0 show the data qualifiers added during data validation. Detailed data validation checklists for each data deliverable are provided in Appendix G.

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6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary and Conclusions

6.1.1 Soil

Seven soil samples were collected at various Holloman AFB Building 1200 locations during the abandoned septic tank /earthen pit investigation. The samples were analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium. Validated analytical results were compared with the NMED residential SSLs, the NMED Residential Direct Exposure Limit for soil contaminated with unknown petroleum oil, and the Holloman AFB soil background values. No parameters were detected that exceeded the New Mexico residential SSLs. Additionally, all soil samples from all locations and depths were non-detect for PCBs, cyanide, tritium, and TPH-GRO, TPH-DRO, and TPH-ORO.

Risk-based health screening was not performed since no COPCs were identified in soil. The ecological evaluation concluded that risks to the ecological system at and surrounding the site are acceptable.

6.1.2 Groundwater

The groundwater investigation at the Building 1200 former septic tank location indicated no groundwater present in the any of the soil borings. As a result, a monitoring well was not installed, groundwater was not sampled, and a risk-based health screening was not performed.

6.2 Recommendations

6.2.1 Soil

No COPCs were detected in soil above the NMED residential SSLs and no unacceptable ecological risk was identified for the site and its surroundings. Therefore, no additional corrective action is recommended for soil at Building 1200.

6.2.2 Groundwater

No groundwater was encountered at this site; therefore, no corrective action is recommended for groundwater at Building 1200.

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7.0 REFERENCES

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Tables

Table 3-1
Sample Summary
Building 1200 (OT-C537) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C537-Station 1	681051.3567	1690021.7731	7/16/2012	Investigation Soil	3 - 5	OTC537-IS-0001-071612	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/16/2012	Investigation Soil	10 - 12	OTC537-IS-0002-071612	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OT-C537-Station 2	681032.8191	1690016.0497	7/16/2012	Investigation Soil	7 - 9	OTC537-IS-0003-071612	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/16/2012	Investigation Soil	14 - 16	OTC537-IS-0004-071612	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1200 (OT-C537) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C537-Station 3	681022.6111	1690019.8466	7/16/2012	Investigation Soil	3 - 5	OTC537-IS-0005-071612	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/16/2012	Investigation Soil	10 - 12	OTC537-IS-0006-071612	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/16/2012	Investigation Soil - Field Duplicate	10 - 12	OTC537-IS-0007-071612-FD	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1200 (OT-C537) RFI Report
Holloman Air Force Base, New Mexico

Notes:

[a] Coordinates are referenced to the North American Datum, 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] EPA, 2007, Test Methods for Evaluating Soil Waste Physical/Chemical Methods, EPA Publication SW-846, Final Update IV. Available online at www.epa.gov/osw/hazard/testmethods/sw846.

Percent Solids and Total Dissolved Solids from *Standard Methods for the Examination of Water and Wastewater* , 19th edition, 1995.

bgs = below ground surface
DRO = diesel range organics
EPA = Environmental Protection Agency
FD = field duplicate
ft = feet/foot
GRO = gasoline range organics
IS = investigation soil
ORO = oil range organics
PCB = polychlorinated biphenyl
RFI = RCRA Facility Investigation
RCRA = Resource Conservation and Recovery Act
SVOC = semivolatile organic compound
TAL = target analyte list
TPH = total petroleum hydrocarbons
VOC = volatile organic compound

Table 4-1
Soil Analytical Data
Building 1200 (OT-C537) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC537-IS-0001-071612		OTC537-IS-0002-071612		OTC537-IS-0003-071612		OTC537-IS-0004-071612		OTC537-IS-0005-071612		OTC537-IS-0006-071612		OTC537-IS-0007-071612-FD	
				Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
				Location	OTC537-Station 1 Influent to tank		OTC537-Station 1 Influent to tank		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**81.5**		**87.7**		**88.1**		**87.3**		**83.7**		**87.3**		**87.8**	
VOLATILES (mg/kg)																		
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0018	U	0.001	U	0.0011	U	0.0011	U	0.0014	U	0.0013	U	0.0011	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.002	U	0.0011	U	0.0012	U	0.0012	U	0.0015	U	0.0015	U	0.0012	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0028	U	0.0016	U	0.0017	U	0.0017	U	0.0022	U	0.0021	U	0.0017	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0018	U	0.001	U	0.0011	U	0.0011	U	0.0014	U	0.0013	U	0.0011	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0018	U	0.001	U	0.0011	U	0.0011	U	0.0014	U	0.0013	U	0.0011	U
1,1-DICHLOROETHENE	NE	240	449		0.0023	U	0.0013	U	0.0014	U	0.0014	U	0.0018	U	0.0017	U	0.0014	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.002	U	0.0011	U	0.0012	U	0.0012	U	0.0015	U	0.0015	U	0.0012	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0038	U	0.0022	U	0.0023	U	0.0023	U	0.0029	U	0.0028	U	0.0023	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.0016	U	0.00094	U	0.00098	U	0.00099	U	0.0013	U	0.0012	U	0.001	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0018	U	0.001	U	0.0011	U	0.0011	U	0.0014	U	0.0013	U	0.0011	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.0016	U	0.00094	U	0.00098	U	0.00099	U	0.0013	U	0.0012	U	0.001	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.002	U	0.0011	U	0.0012	U	0.0012	U	0.0015	U	0.0015	U	0.0012	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.002	U	0.0011	U	0.0012	U	0.0012	U	0.0015	U	0.0015	U	0.0012	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0018	U	0.001	U	0.0011	U	0.0011	U	0.0014	U	0.0013	U	0.0011	U
2-HEXANONE	NE	210	NE		0.0089	U	0.0051	U	0.0053	U	0.0053	U	0.0069	U	0.0066	U	0.0055	U
ACETONE	NE	61000	66600		0.033	U	0.019	U	0.02	U	0.02	U	0.026	U	0.025	U	0.02	U
BENZENE	NE	1.1	15.4		0.0025	U	0.0014	U	0.0015	U	0.0015	U	0.0019	U	0.0018	U	0.0015	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0018	U	0.001	U	0.0011	U	0.0011	U	0.0014	U	0.0013	U	0.0011	U
BROMOFORM	NE	62	616		0.0025	U	0.0014	U	0.0015	U	0.0015	U	0.0019	U	0.0018	U	0.0015	U
BROMOMETHANE	NE	7.3	16.5		0.0033	U	0.0019	U	0.002	U	0.002	U	0.0026	U	0.0025	U	0.002	U
CARBON DISULFIDE	NE	820	1530		0.0033	U	0.0019	U	0.002	U	0.002	U	0.0026	U	0.0025	U	0.002	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.003	U	0.0017	U	0.0018	U	0.0018	U	0.0023	U	0.0022	U	0.0018	U
CHLOROBENZENE	NE	290	376		0.0016	U	0.00094	U	0.00098	U	0.00099	U	0.0013	U	0.0012	U	0.001	U
CHLOROETHANE	NE	15000	29800		0.0033	U	0.0019	U	0.002	U	0.002	U	0.0026	U	0.0025	U	0.002	U
CHLOROFORM	NE	0.29	5.86		0.002	U	0.0011	U	0.0012	U	0.0012	U	0.0015	U	0.0015	U	0.0012	U
CHLOROMETHANE	NE	120	275		0.0033	U	0.0019	U	0.002	U	0.002	U	0.0026	U	0.0025	U	0.002	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0025	U	0.0014	U	0.0015	U	0.0015	U	0.0019	U	0.0018	U	0.0015	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0016	U	0.00094	U	0.00098	U	0.00099	U	0.0013	U	0.0012	U	0.001	U
CYCLOHEXANE	NE	7000	NE		0.0023	U	0.0013	U	0.0014	U	0.0014	U	0.0018	U	0.0017	U	0.0014	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.0016	U	0.00094	U	0.00098	U	0.00099	U	0.0013	U	0.0012	U	0.001	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0025	U	0.0014	U	0.0015	U	0.0015	U	0.0019	U	0.0018	U	0.0015	U
ETHYLBENZENE	NE	5.4	68.4		0.0016	U	0.00094	U	0.00098	U	0.00099	U	0.0013	U	0.0012	U	0.001	U
ISOPROPYLBENZENE	NE	2100	2430		0.0018	U	0.001	U	0.0011	U	0.0011	U	0.0014	U	0.0013	U	0.0011	U
METHYL ACETATE	NE	78000	78200		0.021	U	0.012	U	0.012	U	0.012	U	0.016	U	0.015	U	0.013	U
METHYL ETHYL KETONE	NE	28000	37100		0.01	U	0.0057	U	0.006	U	0.006	U	0.0078	U	0.0075	U	0.0062	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0091	U	0.0052	U	0.0054	U	0.0054	U	0.007	U	0.0067	U	0.0056	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0021	U	0.0012	U	0.0013	U	0.0013	U	0.0017	U	0.0016	U	0.0013	U
METHYLENE CHLORIDE	NE	56	409		0.0076	U	0.0043	U	0.0045	U	0.0045	U	0.0059	U	0.0056	U	0.0047	U

Table 4-1
Soil Analytical Data
Building 1200 (OT-C537) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC537-IS-0001-071612		OTC537-IS-0002-071612		OTC537-IS-0003-071612		OTC537-IS-0004-071612		OTC537-IS-0005-071612		OTC537-IS-0006-071612		OTC537-IS-0007-071612-FD	
				Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
				Location	OTC537-Station 1 Influent to tank		OTC537-Station 1 Influent to tank		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																		
STYRENE	NE	6300	7280		0.0043	U	0.0024	U	0.0026	U	0.0026	U	0.0033	U	0.0032	U	0.0026	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0033	U	0.0019	U	0.002	U	0.002	U	0.0026	U	0.0025	U	0.002	U
TETRACHLOROETHYLENE	NE	22	7.02		0.0016	U	0.00094	U	0.00098	U	0.00099	U	0.0013	U	0.0012	U	0.001	U
TOLUENE	NE	5000	5270		0.002	U	0.0011	U	0.0012	U	0.0012	U	0.0015	U	0.0015	U	0.0012	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0025	U	0.0014	U	0.0015	U	0.0015	U	0.0019	U	0.0018	U	0.0015	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0018	U	0.001	U	0.0011	U	0.0011	U	0.0014	U	0.0013	U	0.0011	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.002	U	0.0011	U	0.0012	U	0.0012	U	0.0015	U	0.0015	U	0.0012	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0033	U	0.0019	U	0.002	U	0.002	U	0.0026	U	0.0025	U	0.002	U
VINYL CHLORIDE	NE	0.06	0.728		0.0025	U	0.0014	U	0.0015	U	0.0015	U	0.0019	U	0.0018	U	0.0015	U
XYLENES, TOTAL	NE	630	814		0.0053	U	0.003	U	0.0031	U	0.0032	U	0.0041	U	0.0039	U	0.0033	U
SEMIVOLATILES (mg/kg)																		
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
2,4-DICHLOROPHENOL	NE	180	183		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.026	U	0.024	U	0.023	U	0.024	U	0.025	U	0.024	U	0.024	U
2,4-DINITROPHENOL	NE	120	122		0.41	U	0.38	U	0.37	U	0.38	U	0.4	U	0.38	UJ	0.38	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
2,6-DINITROTOLUENE	NE	61	61.1		0.024	U	0.022	U	0.022	U	0.022	U	0.023	U	0.022	U	0.022	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
2-CHLOROPHENOL	NE	390	391		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
2-METHYLNAPHTHALENE	NE	230	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
2-METHYLPHENOL	NE	3100	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
2-NITROANILINE	NE	610	NE		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
2-NITROPHENOL	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
3-NITROANILINE	NE	NE	NE		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.082	U	0.075	U	0.074	U	0.075	U	0.08	U	0.075	UJ	0.076	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
4-CHLOROANILINE	NE	2.4	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
4-NITROANILINE	NE	24	NE		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
4-NITROPHENOL	NE	NE	NE		0.16	U	0.15	U	0.15	U	0.15	U	0.16	U	0.15	U	0.15	U
ACENAPHTHENE	NE	3400	3440		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
ACENAPHTHYLENE	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
ACETOPHENONE	NE	7800	7820		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
ANTHRACENE	NE	17000	17200		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
ATRAZINE	NE	2.1	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U

Table 4-1
Soil Analytical Data
Building 1200 (OT-C537) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC537-IS-0001-071612		OTC537-IS-0002-071612		OTC537-IS-0003-071612		OTC537-IS-0004-071612		OTC537-IS-0005-071612		OTC537-IS-0006-071612		OTC537-IS-0007-071612-FD	
				Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
				Location	OTC537-Station 1 Influent to tank		OTC537-Station 1 Influent to tank		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																		
BENZALDEHYDE	NE	7800	NE		0.2	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
BENZO(A)ANTHRACENE	NE	0.15	1.48		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
BENZO(A)PYRENE	NE	0.015	0.148		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
BENZO(G,H,I)PERYLENE	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
BENZYL BUTYL PHTHALATE	NE	260	NE		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
BIPHENYL	NE	51	57.1		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347		0.082	U	0.075	U	0.074	U	0.075	U	0.08	U	0.075	U	0.076	U
CAPROLACTAM	NE	31000	NE		0.065	U	0.06	U	0.06	UJ	0.06	U	0.064	U	0.06	U	0.061	U
CARBAZOLE	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
CHRYSENE	NE	15	148		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
DIBENZOFURAN	NE	78	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
DIETHYL PHTHALATE	NE	49000	48900		0.082	U	0.075	U	0.074	U	0.075	U	0.08	U	0.075	U	0.076	U
DIMETHYL PHTHALATE	NE	611000	611000		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
DI-N-BUTYL PHTHALATE	NE	6100	6110		0.082	U	0.075	U	0.074	U	0.075	U	0.08	U	0.075	U	0.076	U
DI-N-OCTYLPHTHALATE	NE	730	NE		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
FLUORANTHENE	NE	2300	2290		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
FLUORENE	NE	2300	2290		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
HEXACHLOROBENZENE	NE	0.3	3.04		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
HEXACHLOROBUTADIENE	NE	6.2	61.1		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367		0.09	U	0.083	U	0.082	U	0.083	U	0.088	U	0.083	UJ	0.084	U
HEXACHLOROETHANE	NE	12	42.8		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
ISOPHORONE	NE	510	5120		0.02	U	0.019	U	0.019	U	0.019	U	0.02	UJ	0.019	U	0.019	U
M,P-CRESOL	NE	NE	NE		0.029	U	0.027	U	0.027	U	0.027	U	0.029	U	0.027	U	0.027	U
NAPHTHALENE	NE	3.6	43.0		0.033	U	0.03	U	0.03	U	0.03	U	0.032	U	0.03	U	0.03	U
NITROBENZENE	NE	4.8	53.5		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
N-NITROSODIPHENYLAMINE	NE	99	993		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
PENTACHLOROPHENOL	NE	0.89	8.94		0.25	U	0.23	U	0.22	U	0.23	U	0.24	U	0.23	U	0.23	U
PHENANTHRENE	NE	1830	1830		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
PHENOL	NE	18000	18300		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
PYRENE	NE	1700	1720		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U

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Soil Analytical Data
Building 1200 (OT-C537) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC537-IS-0001-071612		OTC537-IS-0002-071612		OTC537-IS-0003-071612		OTC537-IS-0004-071612		OTC537-IS-0005-071612		OTC537-IS-0006-071612		OTC537-IS-0007-071612-FD	
				Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
				Location	OTC537-Station 1 Influent to tank		OTC537-Station 1 Influent to tank		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																		
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
1,3-DINITROBENZENE	NE	6.10	NE	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
2,4-DINITROTOLUENE	NE	1.60	15.7	0.087	U	0.088	U	0.075	U	0.082	U	0.09	U	0.072	U	0.092	U	
2,6-DINITROTOLUENE	NE	61.0	61.1	0.078	U	0.079	U	0.067	U	0.073	U	0.081	U	0.064	U	0.083	U	
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
2-NITROTOLUENE	NE	2.90	29.1	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
3-NITROTOLUENE	NE	6.10	7.82	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
4-NITROTOLUENE	NE	30.0	244.4	0.091	U	0.091	U	0.078	U	0.085	U	0.094	U	0.075	U	0.096	U	
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
NITROBENZENE	NE	4.80	53.5	0.083	U	0.084	U	0.072	U	0.078	U	0.086	U	0.069	U	0.089	U	
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
TETRYL	NE	240.0	244.0	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
PCBS (mg/kg)																		
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0081	U	0.0076	U	0.0075	UJ	0.0076	U	0.0079	U	0.0076	U	0.0075	U	
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.01	U	0.0095	U	0.0094	U	0.0095	U	0.0099	U	0.0095	U	0.0093	U	
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.01	U	0.0095	U	0.0094	U	0.0095	U	0.0099	U	0.0095	U	0.0093	U	
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0081	U	0.0076	U	0.0075	U	0.0076	U	0.0079	U	0.0076	U	0.0075	U	
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0081	U	0.0076	U	0.0075	U	0.0076	U	0.0079	U	0.0076	U	0.0075	U	
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0081	U	0.0076	U	0.0075	U	0.0076	U	0.0079	U	0.0076	U	0.0075	U	
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0081	U	0.0076	U	0.0075	UJ	0.0076	U	0.0079	U	0.0076	U	0.0075	U	
METALS (mg/kg)																		
ALUMINUM	13722	77000	78000	**1450**		**3790**		**4970**	J	**7700**		**1010**		**6320**		**5730**		
ANTIMONY	1.6	31	31.3	1.9	U	0.78	U	1.1	UJ	0.84	U	1.1	U	0.94	U	0.84	U	
ARSENIC	3.7	0.39	3.90	**1.1**	J	0.78	U	**1.3**	J	**2.6**	J	1.1	U	**1.4**	J	**1.6**	J	
BARIUM	169.3	15000	15600	**26.7**	J	**35.3**	J	**39.6**	J	**90.2**		**17.7**	J	**49**	J	**46.8**	J	
BERYLLIUM	1.6	160	156	0.46	U	0.39	U	0.55	U	**0.49**	J	0.54	U	0.47	U	0.42	U	
CADMIUM	0.3	70	70.3	0.93	U	0.39	U	0.55	U	0.42	U	0.54	U	0.47	U	0.42	U	
CALCIUM	317332	NE	NE	**254000**		**178000**		**198000**		**165000**		**297000**		**199000**		**215000**		
CHROMIUM[d]	25	117000	117000	**1.4**	J	**4.1**		**5.4**	J	**9.6**		**0.7**	J	**7.2**		**6.7**		
COBALT	7.7	23	NE	**1.1**	J	**1.4**	J	**1.8**	J	**4.6**	J	**0.59**	J	**2.5**	J	**2.3**	J	
COPPER	13	3100	3130	**1.4**	J	**2.5**	J	**2.9**	J	**6.9**	J	**1.2**	J	**3.6**	J	**3.7**	J	
IRON	23049	55000	54800	**1110**		**3660**		**4780**	J	**8780**		**915**		**6050**		**5560**		
LEAD	10.9	400	400	0.93	U	**2.2**	J	**2.8**	J	**5.7**	J	**2.6**	J	**4**	J	**4.5**	J	
MAGNESIUM	16991	NE	NE	**3660**		**2770**		**2560**	J	**4560**		**788**	J	**3190**		**2980**		
MANGANESE	393	1800	1860	**21.6**		**74.7**		**89.2**	J	**365**		**35.8**		**107**		**101**		
MERCURY	0.0108	10	15.6	0.0097	U	0.0088	U	0.0092	U	**0.047**	J	0.0095	U	0.0089	U	0.009	U	
NICKEL	17.4	1500	1560	**1.8**	J	**3.3**	J	**4.2**	J	**10**	J	**1.5**	J	**5.7**	J	**5.1**	J	
POTASSIUM	5077	NE	NE	**406**	J	**888**	J	**1110**	J	**1580**	J	**282**	J	**1410**	J	**1300**	J	

Table 4-1
Soil Analytical Data
Building 1200 (OT-C537) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC537-IS-0001-071612		OTC537-IS-0002-071612		OTC537-IS-0003-071612		OTC537-IS-0004-071612		OTC537-IS-0005-071612		OTC537-IS-0006-071612		OTC537-IS-0007-071612-FD	
			Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
			Location	OTC537-Station 1 Influent to tank		OTC537-Station 1 Influent to tank		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		10 - 12	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
METALS - continued (mg/kg)																	
SELENIUM	1.4	390	391	3.7	U	1.6	U	2.2	U	1.7	U	2.2	U	1.9	U	1.7	U
SILVER	1.1	390	391	0.46	U	0.39	U	0.55	U	0.42	U	0.54	U	0.47	U	0.42	U
SODIUM	5196	NE	NE	**1870**	J	**1020**	J	610	U	460	U	600	U	**698**	J	**605**	J
THALLIUM	1.3	0.78	0.782	2.4	U	1	U	1.4	U	1.1	U	1.4	U	1.2	U	1.1	U
VANADIUM	42.6	390	391	**7.4**	J	**7.9**	J	**9.6**	J	**19.7**	J	**2.8**	J	**11.9**	J	**11**	J
ZINC	54.6	23000	23500	4.6	U	**10.1**		**12.9**		**26.5**		2.7	U	**16.7**		**14.9**	
PETROLEUM HYDROCARBONS (mg/kg)																	
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	3.8	U	2.7	U	3	U	3.2	U	4.1	U	3.1	U	3	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	4.1	U	3.8	U	3.7	U	3.8	U	4	U	3.8	U	3.7	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000	4.1	U	3.8	U	3.7	U	3.8	U	4	U	3.8	U	3.7	U
CYANIDE (mg/kg)																	
CYANIDE	NE	22.0	46.9	0.071	U	0.066	U	0.067	U	0.067	U	0.07	U	0.069	U	0.066	U
TRITIUM (pCi/g)																	
TRITIUM	NE	NE	NE	5.2	U	5.28	U	5.23	U	5.14	U	5.17	U	5.02	U	5.19	U

Table 4-1
Soil Analytical Data
Buidling 1200 (OT-C537) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

EPA = U.S. Environmental Protection Agency
FD = field duplicate
ft bgs = feet below ground surface
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Table 4-2
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	LDY-IDW01-090412	
		Sample Date	9/4/2012	
		Sample Type	Waste	
		40 CFR 261 Waste Characteristic Criteria	Result	Lab Qual
General Chemistry				
Corrosivity as pH	pH Units	> 2 and < 12.5	**7.7**	
Cyanide Reactivity	mg/kg	< 250	1.5	U
Ignitability (Flashpoint)	°F	> 140 °F	>200	
Solids, Percent	%	-	**84.4**	
Sulfide Reactivity	mg/kg	< 500	59	U
TCLP Volatiles				
Benzene	mg/L	0.5	0.0020	U
Chlorobenzene	mg/L	100	0.0020	U
Chloroform	mg/L	6	0.0022	U
Carbon tetrachloride	mg/L	0.5	0.0025	U
1,1-Dichloroethylene	mg/L	0.7	0.0023	U
1,2-Dichloroethane	mg/L	0.5	0.0020	U
p-Dichlorobenzene	mg/L	7.5	0.0023	U
Methyl ethyl ketone	mg/L	200	0.0020	U
Tetrachloroethylene	mg/L	0.7	0.0025	U
Trichloroethylene	mg/L	0.5	0.0026	U
Vinyl chloride	mg/L	0.2	0.0022	U
TCLP Semivolatiles				
2-Methylphenol	mg/L	200	0.0054	U
3&4-Methylphenol	mg/L	200	0.011	U
Pentachlorophenol	mg/L	100	0.054	U
2,4,5-Trichlorophenol	mg/L	400	0.0050	U
2,4,6-Trichlorophenol	mg/L	2	0.0050	U
1,4-Dichlorobenzene	mg/L	7.5	0.010	U
2,4-Dinitrotoluene	mg/L	0.13	0.0050	U
Hexachlorobenzene	mg/L	0.13	0.0056	U
Hexachlorobutadiene	mg/L	0.5	0.010	U
Hexachloroethane	mg/L	3	0.010	U
Nitrobenzene	mg/L	2	0.0059	U
Pyridine	mg/L	100	0.016	U
TCLP Metals				
Arsenic	mg/L	5	0.020	U
Barium	mg/L	100	**0.12**	J
Cadmium	mg/L	1	0.010	U
Chromium	mg/L	5	0.010	U
Lead	mg/L	5	0.010	U
Mercury	mg/L	0.2	0.00050	U
Selenium	mg/L	1	0.020	U
Silver	mg/L	5	0.010	U

Table 4-2
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

°F = degrees Fahrenheit
> = greater than
< = less than
% = percent
CFR = Code of Federal Regulations
J = estimated value
Lab Qual = laboratory qualifier
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
TCLP = Toxicity Characteristic Leaching Procedure
U = not detected at the detection limit shown

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles				
Acetone	µg/L	NE	10	U
Benzene	µg/L	5	0.21	U
Bromodichloromethane	µg/L	80	0.20	U
Bromoform	µg/L	80	0.34	U
Chlorobenzene	µg/L	100	0.20	U
Chloroethane	µg/L	NE	0.50	U
Chloroform	µg/L	80	0.26	U
Carbon disulfide	µg/L	NE	0.49	U
Carbon tetrachloride	µg/L	5	0.31	U
Cyclohexane	µg/L	NE	0.48	U
1,1-Dichloroethane	µg/L	NE	0.21	U
1,1-Dichloroethylene	µg/L	7	0.20	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.71	U
1,2-Dibromoethane	µg/L	0.05	0.30	U
1,2-Dichloroethane	µg/L	5	0.22	U
1,2-Dichloropropane	µg/L	5	0.26	U
Dibromochloromethane	µg/L	80	0.20	U
Dichlorodifluoromethane	µg/L	NE	0.50	U
cis-1,2-Dichloroethylene	µg/L	70	**0.42**	J
cis-1,3-Dichloropropene	µg/L	NE	0.22	U
m-Dichlorobenzene	µg/L	NE	0.25	U
o-Dichlorobenzene	µg/L	600	0.22	U
p-Dichlorobenzene	µg/L	75	0.20	U
trans-1,2-Dichloroethylene	µg/L	100	0.23	U
trans-1,3-Dichloropropene	µg/L	NE	0.21	U
Ethylbenzene	µg/L	700	0.29	U
Freon 113	µg/L	NE	0.33	U
2-Hexanone	µg/L	NE	2.0	U
Isopropylbenzene	µg/L	NE	0.20	U
4-Methyl-2-pentanone	µg/L	NE	2.3	U
Methyl Acetate	µg/L	NE	5.0	U
Methyl bromide	µg/L	NE	0.79	U
Methyl chloride	µg/L	NE	0.50	U
Methylcyclohexane	µg/L	NE	0.20	U
Methylene chloride	µg/L	5	2.0	U
Methyl ethyl ketone	µg/L	NE	3.1	U
Methyl Tert Butyl Ether	µg/L	NE	0.21	U
Styrene	µg/L	100	0.20	U

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles (continued)				
1,1,1-Trichloroethane	µg/L	200	0.20	U
1,1,2,2-Tetrachloroethane	µg/L	NE	0.24	U
1,1,2-Trichloroethane	µg/L	5	0.20	U
1,2,4-Trichlorobenzene	µg/L	70	0.50	U
Tetrachloroethylene	µg/L	5	0.32	U
Toluene	µg/L	1000	0.20	U
Trichloroethylene	µg/L	5	0.31	U
Trichlorofluoromethane	µg/L	NE	0.50	U
Vinyl chloride	µg/L	2	0.44	U
Xylene (total)	µg/L	10000	0.50	U
Semivolatiles				
2-Chlorophenol	µg/L	NE	0.68	U
4-Chloro-3-methyl phenol	µg/L	NE	0.78	U
2,4-Dichlorophenol	µg/L	NE	0.67	U
2,4-Dimethylphenol	µg/L	NE	0.74	U
2,4-Dinitrophenol	µg/L	NE	5.0	U
4,6-Dinitro-o-cresol	µg/L	NE	1.4	U
2-Methylphenol	µg/L	NE	0.69	U
3&4-Methylphenol	µg/L	NE	1.3	U
2-Nitrophenol	µg/L	NE	0.65	U
4-Nitrophenol	µg/L	NE	4.8	U
Pentachlorophenol	µg/L	1	4.8	U
Phenol	µg/L	NE	0.53	U
2,4,5-Trichlorophenol	µg/L	NE	0.86	U
2,4,6-Trichlorophenol	µg/L	NE	0.75	U
Acenaphthene	µg/L	NE	0.67	U
Acenaphthylene	µg/L	NE	0.67	U
Acetophenone	µg/L	NE	0.72	U
Anthracene	µg/L	NE	0.72	U
Atrazine	µg/L	3	0.83	U
Benzaldehyde	µg/L	NE	4.8	U
Benzo(a)anthracene	µg/L	NE	0.52	U
Benzo(a)pyrene	µg/L	0.2	0.55	U
Benzo(b)fluoranthene	µg/L	NE	0.73	U
Benzo(g,h,i)perylene	µg/L	NE	0.64	U
Benzo(k)fluoranthene	µg/L	NE	0.64	U
4-Bromophenyl phenyl ether	µg/L	NE	0.76	U
Butyl benzyl phthalate	µg/L	NE	0.68	U
1,1'-Biphenyl	µg/L	NE	0.92	U
2-Chloronaphthalene	µg/L	NE	0.70	U

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Semivolatiles (continued)				
4-Chloroaniline	µg/L	NE	0.66	U
Caprolactam	µg/L	NE	2.4	U
Carbazole	µg/L	NE	0.50	U
Chrysene	µg/L	NE	0.56	U
bis(2-Chloroethoxy)methane	µg/L	NE	0.67	U
bis(2-Chloroethyl)ether	µg/L	NE	0.69	U
bis(2-Chloroisopropyl)ether	µg/L	NE	0.76	U
4-Chlorophenyl phenyl ether	µg/L	NE	0.84	U
2,4-Dinitrotoluene	µg/L	NE	0.66	U
2,6-Dinitrotoluene	µg/L	NE	0.77	U
3,3'-Dichlorobenzidine	µg/L	NE	0.71	U
Dibenzo(a,h)anthracene	µg/L	NE	0.56	U
Dibenzofuran	µg/L	NE	0.72	U
Di-n-butyl phthalate	µg/L	NE	0.96	U
Di-n-octyl phthalate	µg/L	NE	0.96	U
Diethyl phthalate	µg/L	NE	0.96	U
Dimethyl phthalate	µg/L	NE	0.77	U
bis(2-Ethylhexyl)phthalate	µg/L	6	1.1	U
Fluoranthene	µg/L	NE	0.56	U
Fluorene	µg/L	NE	0.73	U
Hexachlorobenzene	µg/L	1	0.66	U
Hexachlorobutadiene	µg/L	NE	0.92	U
Hexachlorocyclopentadiene	µg/L	50	0.76	U
Hexachloroethane	µg/L	NE	0.71	U
Indeno(1,2,3-cd)pyrene	µg/L	NE	0.55	U
Isophorone	µg/L	NE	0.61	U
2-Methylnaphthalene	µg/L	NE	0.66	U
2-Nitroaniline	µg/L	NE	0.72	U
3-Nitroaniline	µg/L	NE	0.62	U
4-Nitroaniline	µg/L	NE	0.93	U
Naphthalene	µg/L	NE	0.61	U
Nitrobenzene	µg/L	NE	0.69	U
N-Nitroso-di-n-propylamine	µg/L	NE	0.82	U
N-Nitrosodiphenylamine	µg/L	NE	0.96	U
Phenanthrene	µg/L	NE	0.68	U
Pyrene	µg/L	NE	0.65	U
Petroleum Hydrocarbons				
Gasoline Range Organics (C6-C10)	mg/L	NE	0.05	U
Diesel Range Organics (C10-C28)	mg/L	NE	**0.115**	J
Oil Range Organics (C28-C40)	mg/L	NE	0.10	U

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Metals				
Aluminum	µg/L	NE	**36.2**	J
Antimony	µg/L	6	**6.7**	J
Arsenic	µg/L	10	2.5	U
Barium	µg/L	2000	**29.1**	J
Beryllium	µg/L	4	0.50	U
Cadmium	µg/L	5	1.0	U
Calcium	µg/L	NE	**654,000**	
Chromium	µg/L	100	4	U
Cobalt	µg/L	NE	**6.2**	J
Copper	µg/L	1300	**2.9**	J
Iron	µg/L	NE	**97.5**	J
Lead	µg/L	15	2.2	U
Magnesium	µg/L	NE	**310,000**	
Manganese	µg/L	NE	**179**	
Mercury	µg/L	2	0.03	U
Nickel	µg/L	NE	**3.7**	J
Potassium	µg/L	NE	**16,500**	
Selenium	µg/L	50	4.0	U
Silver	µg/L	NE	0.50	U
Sodium	µg/L	NE	**762,000**	
Thallium	µg/L	2	0.078	U
Vanadium	µg/L	NE	**4.5**	J
Zinc	µg/L	NE	**12.8**	J

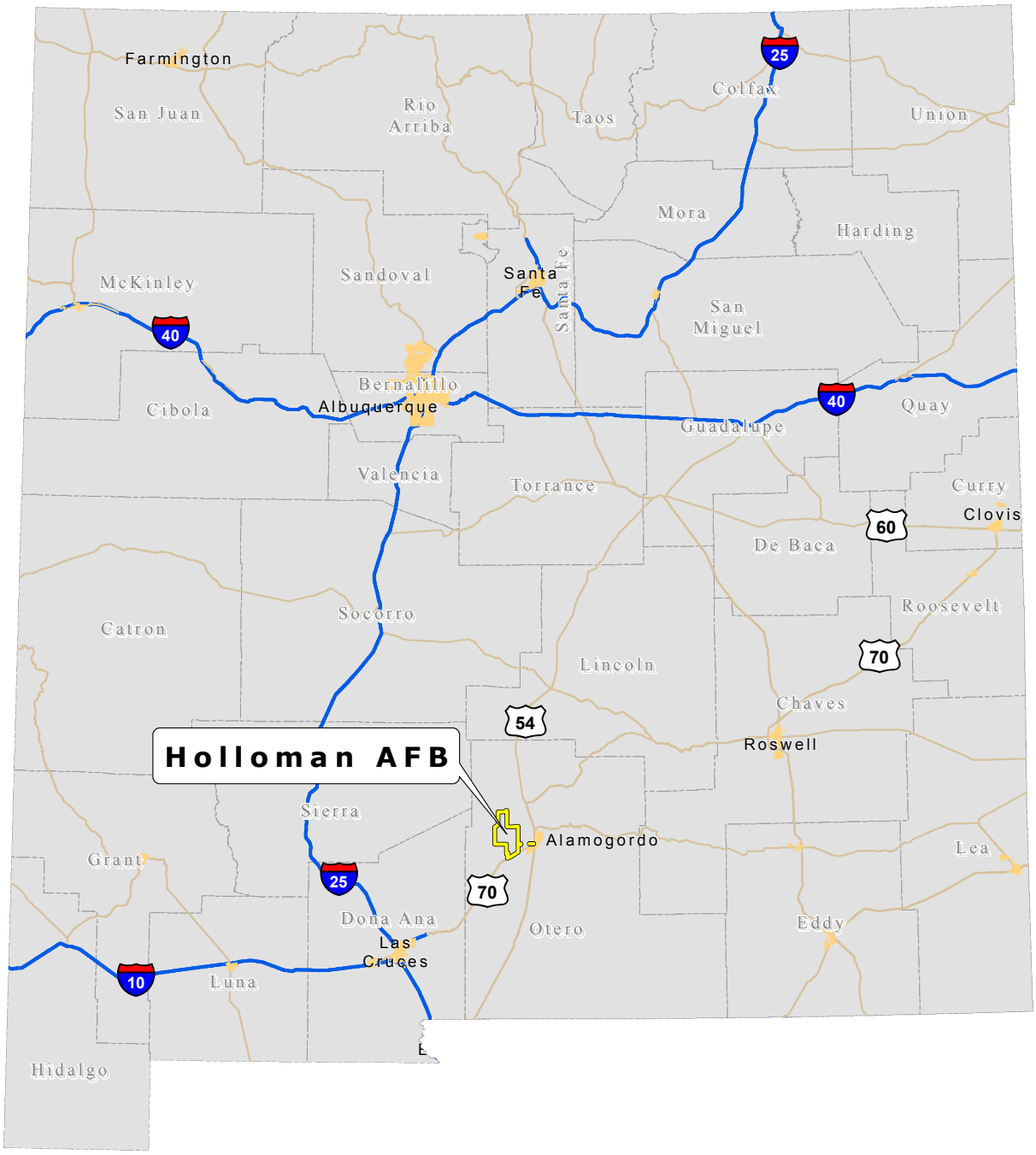
Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

[a] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

EPA = U.S. Environmental Protection Agency.
J = estimated value.
MCL = maximum contaminant level.
µg/L = micrograms per liter.
mg/L = milligrams per liter.
NE = not established
RSL = regional screening level.
U = not detected at the detection limit shown.
VQ = validation qualifier.

Figures



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Date: 8/28/2013

Approved By: BFoss

Checked By: CLong

Drawn By: BGrod

Office: Hou

Legend

Holloman AFB

N

WGS 84 UTM Zone 13N Meters

0 20 40 80
Kilometers

0 10 20 40
Miles

Figure 1-1

Holloman Air Force Base Location

Holloman AFB, New Mexico

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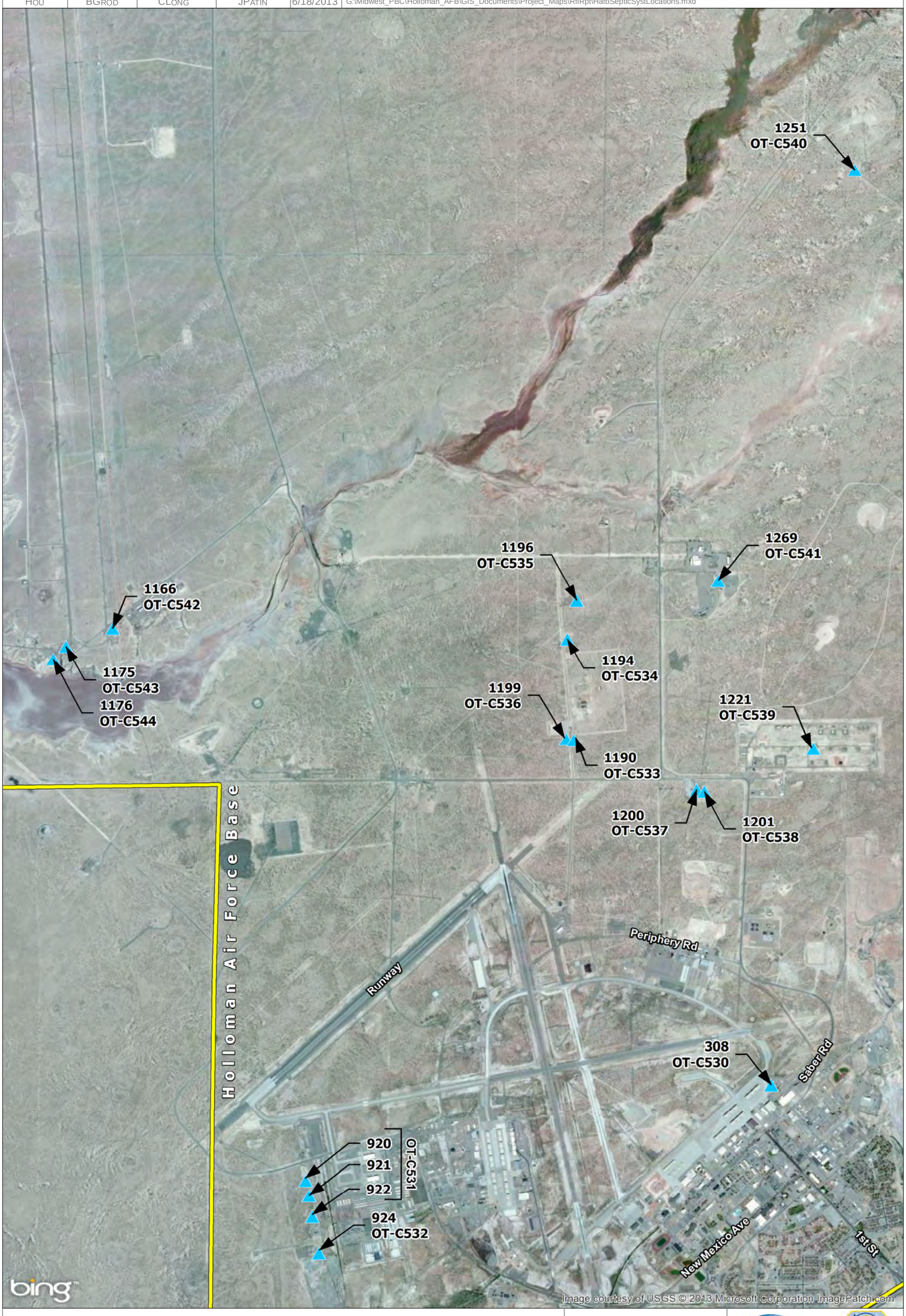


LEGEND

- Holloman AFB
- Septic Tank System

N

WGS 84 UTM Zone 13N
Meters

1 inch = 2,800 feet

0 700 1,400 2,800
Feet

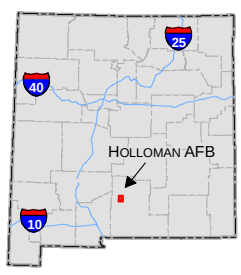
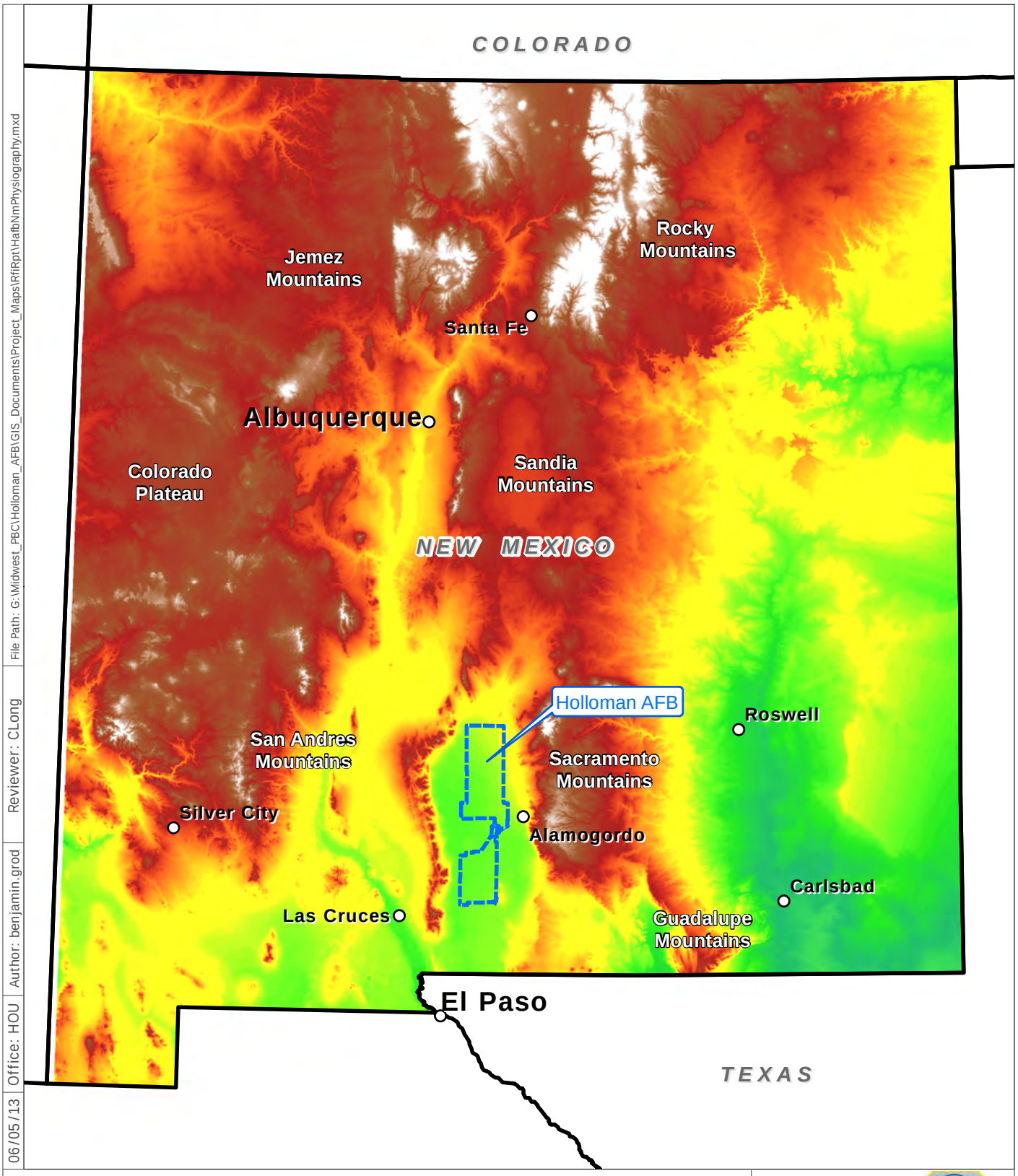


Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
Holloman AFB, NM



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Reviewer: CLong
Author: benjamin.grod
Office: HOU
06/05/13

Legend

Holloman Air Force Base (AFB) Installation Area

Elevation
- High : 3,936 meters
- Low : 0 meters

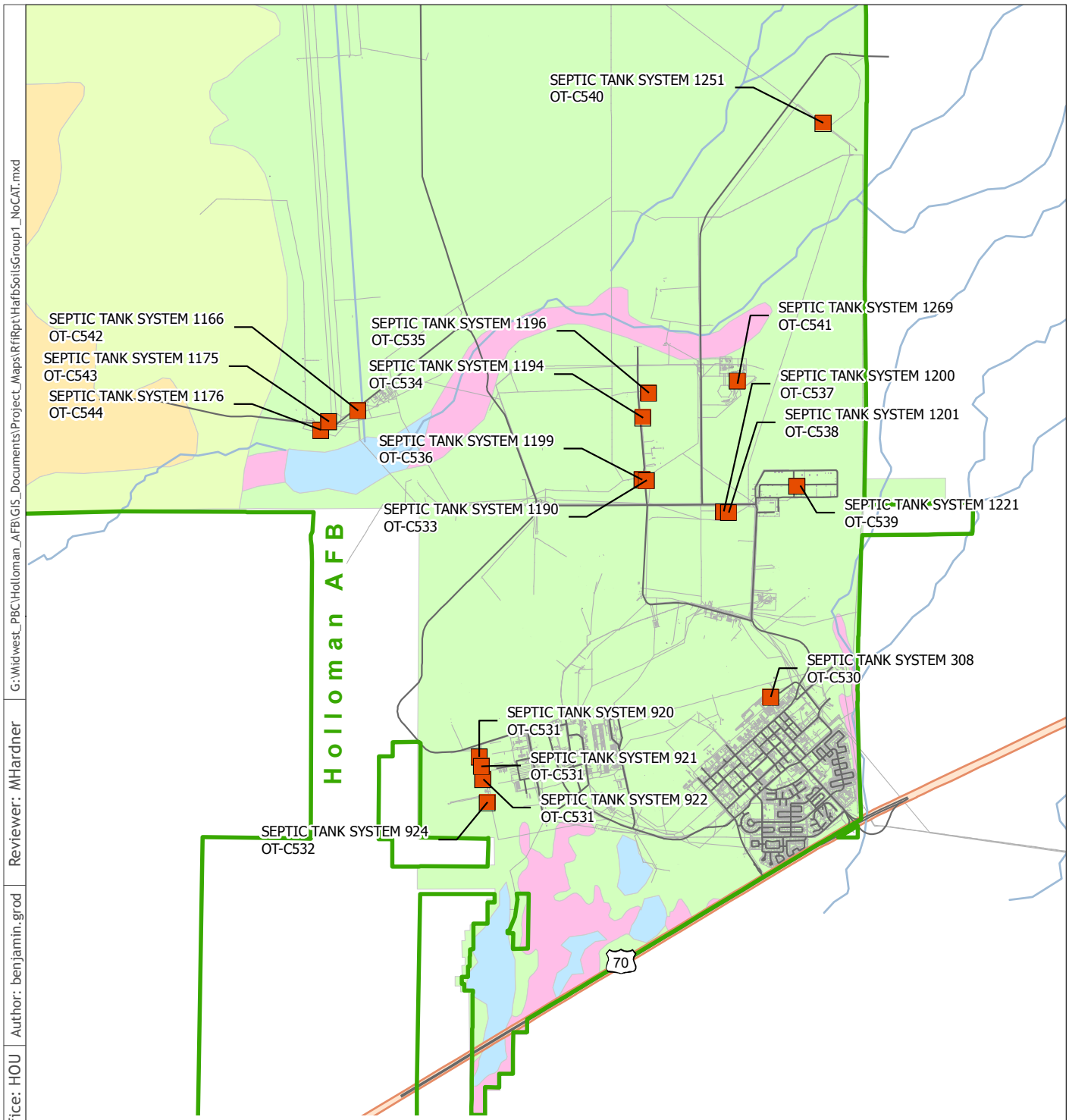
NAD 83 SPCS
New Mexico Central
Feet

0 50
Miles

Figure 2-1

Physiographic Map

Holloman AFB, New Mexico



Note:
1) Soils types at Holloman Air Force Base, New Mexico are based on United States Department of Agriculture (USDA) Soil Conservation Service Classifications. Source USDA, 1981

06/18/13 | Office: HOU | Author: benjamin.grod | Reviewer: MHardner | G:\Widwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbSoilsGroup1_NoCAT.mxd

Legend

- Installation Area
- Group 1 Septic Tank Sites
- Surface Water
- Active Dune Land Gypsum
- Duneland Yesum Association
- Holloman-Gypsum Land-Yesum complex
- Intermittent Water
- Mead Silty Clay Loam
- Rock Land Warm

NAD 83 SPCS
New Mexico Central
Feet

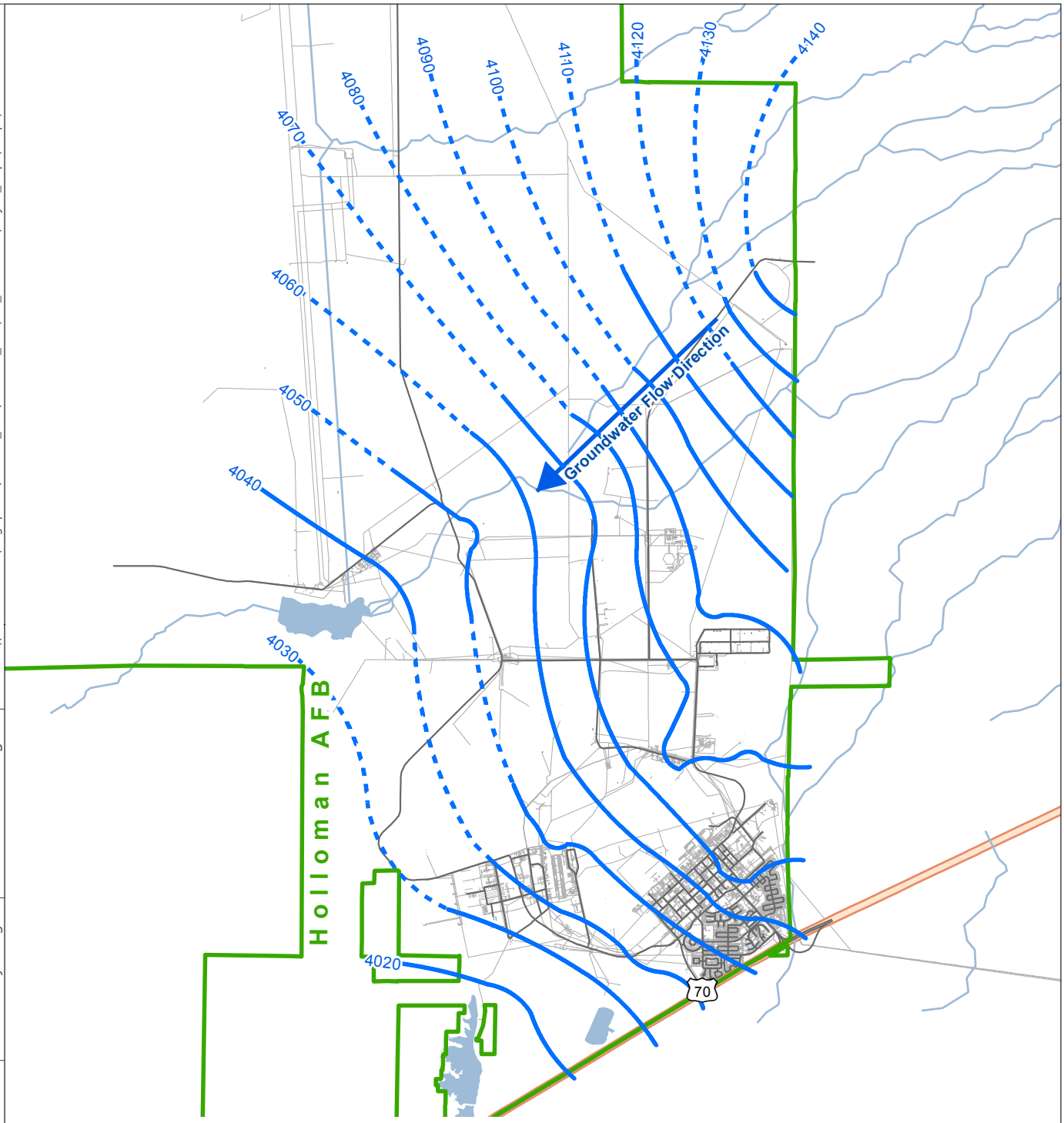
0 7,000
Feet

CBI

Figure 2-2

Septic Systems Soils Map

Holloman AFB, New Mexico



Note:
1) Groundwater contour map showing groundwater elevation contours across Holloman Air Force Base, New Mexico, are based on 2002 measurements taken from the shallow aquifer.
2) Source: Holloman AFB GIS, 2002 LTM.

08/28/13 | Office: HOU | Author: benjamin.grod | Reviewer: CLong | File Path: \\cfsfs01.cfs.com\arcgisprod2\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbGw2002.mxd

Legend

- Installation Area
- Groundwater Flow Direction
- Groundwater Elevation Contour (ft) (Dashed where inferred)
- Surface Water

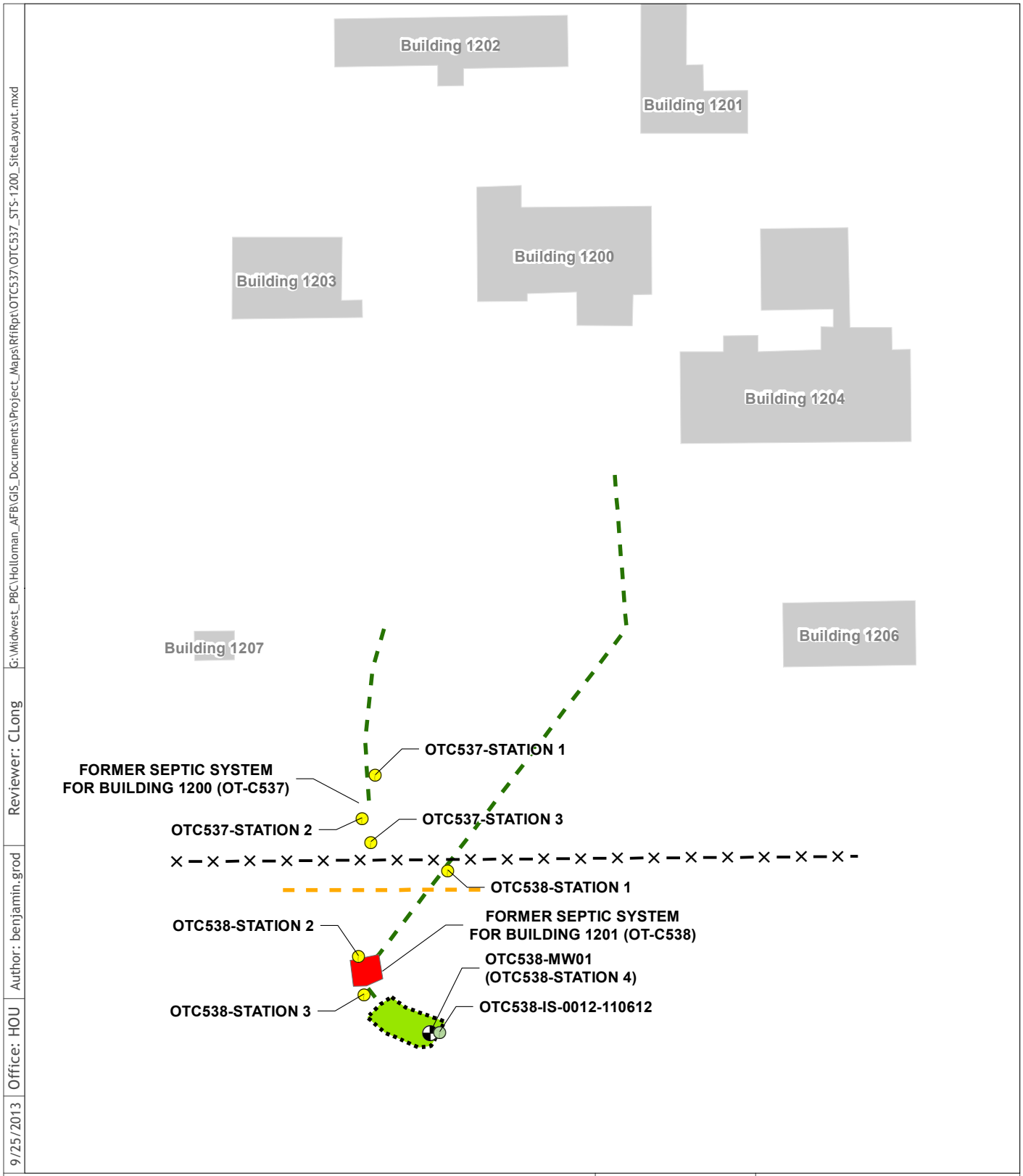
NAD 83 SPCS
New Mexico Central
Feet

0 8,000
Feet

Figure 2-3

Regional Groundwater Contour Map

Holloman AFB, New Mexico



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Legend

- Monitoring Well
- Soil Boring Station
- Confirmation Sample
- Communication Utility
- Influent Line
- Fence
- Septic Tank
- Leach Field
- Building

N

NAD 83 SPCS
New Mexico Central
Feet

0 30 60
Feet

Figure 3-1

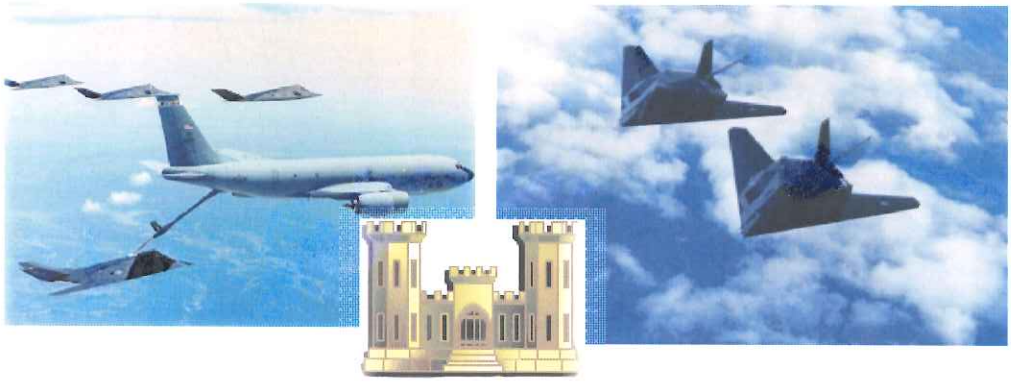
Site Layout and
Sampling Locations
Buildings 1200 & 1201
Septic Tank Systems
OT-C537 & OT-C538

Holloman AFB, New Mexico

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-074

Appendix A
Historical Records

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS



Holloman Air Force Base
New Mexico

APRIL 2007

Headquarters, Air Combat Command
Langley Air Force Base, Virginia

49 CES/CEV
Holloman Air Force Base, New Mexico

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH FIGHTER WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

APR 27 2007

MEMORANDUM FOR NEW MEXICO ENVIRONMENT DEPARTMENT
Attn: Mr. James P. Bearzi
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe NM 87505-6303

FROM: 49 CES/CEV
550 Tabosa Ave.
Holloman AFB NM 88330-8458

SUBJECT: Submittal of Information Required by NMED Letter of August 30, 2006
Septic Tanks and Associated Drain Fields, Holloman AFB
EPA ID# NM6572124422

1. Pursuant to Part 4, Condition IV.B.3 of Permit No. NM6572124422, Holloman AFB is submitting the final portion of the required information.

2. This final portion of the required information covers the history of the facilities served by each septic tank and, based on the historic activities that occurred in each facility, the possible wastes that were discharged into the septic systems.

3. If you have any questions or comments, please contact Mr. Dave Griffin or Mr. George Fish at (505) 572-3931.

DEBORAH J. HARTELL
Chief, Environmental Flight

cc: w/Attachments
Mr. Cornelius Amindyas
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

Mr. David Strasser
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS
HISTORY

Holloman's records show a list of fifty seven (57) septic tank systems broken into three categories- Active Septic Systems, Inactive Septic Systems, and Removed Septic Systems. The systems are identified by the Building number they are/were attached to. There are twenty five (25) Active Septic Systems which are listed in this report. There are twenty one (21) Inactive Septic Systems that are listed and the history of activities in the building associated with the system is identified to the extent of available knowledge. There are eleven (11) Removed Septic Systems listed with histories based on available record knowledge.

The Active systems are identified, but no histories of the buildings are provided as this will likely change over time particularly with change in mission (aircraft on base) or tie-in to the base waste water treatment system. A history will be added to this list if and when the septic system is no longer needed and moved to the Inactive or Removed list.

The Inactive systems are scheduled for proper closure per guidance given in the NMED Liquid Waste Regulation 20.7.3.307 NMAC. This regulation calls for capping of the line(s) from the building to the septic tank, pumping out the tanks contents, penetration of the bottom of the tank, along with collapse of the tank roof and filling of the tank with sand or soil.

The septic systems on the Removed list have had the actual septic tank excavated and removed.

A search of Real Property records and the Historic Properties Inventory yielded the information available on the buildings. There was not information available on every building, but if new information becomes available, it will be added to the list.

Attachment 54a-e shows the current plan of where the sewer system lies to show what buildings are currently connected to Holloman's Sewer System. Any building that does not have an active septic tank is either abandoned or connect to Holloman's Sewer System.

ACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	149	1998		1000
2	312	1994		1000
3	375	1968		500
4	882			
5	864 (863)	1994	5'x8'x6'4"	750
6	885	1970	7'10"x4'8"x6'10"	1000
7	886			
8	887	1991		1000
9	923	1959	4'2"x7"x7'9.5"	1600
10	1022	1992		1200
11	1066	1994		1000
12	1160	1957	5'x12'4"x7'6"	1500
13	1161	1957		750
14	1162	1957		350
15	1163	1957		350
16	1169	1962		1680
17	1195	1962		1260
18	1256	1970	12'8"x4'8"x5'	
19	1270			
20	1271			
21	1278	2004		1250
22	1284			
23	1625			
24	75600	1989		1200
25	La Luz Gate (1290)(**1292**)	2004		1250

INACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	308	1965		
2	920	1959	4'2"x7"x7'9.5"	1600
3	921	1959	4'2"x7"x7'9.5"	1600
4	922	1959	4'2"x7"x7'9.5"	1600
5	924	1959	4'2"x7"x7'9.5"	1600
6	1091	1969	6'8"x3'x8'5"	
7	1097	1987	5'10"x5'x7'8"	1672
8	1190	1952	9'x4'x8'10"	3000
9	1194	1987	4'x4'x8'10"	1350
10	1196	1993	4'6"x11'x6'	1300
11	1199	1957		500
12	1200	1954	4'x8'x4'	1000
13	1201	1951	2'6"x6'6"x5'5"	650
14	1219	1985	5'4"x10'6"x8'4"	
15	1221	1983	4'8"x9'4"x6'2"	1100
16	1226	1985	5'6'2"x6'	
17	1235	1986		1189
18	1239	1977	4'6"x8'6"x6'	750
19	1250	1957		350
20	1251			
21	1269	1966	4'6"x9'	500

INACTIVE SEPTIC SYSTEMS

BUILDING 308

This is a 3200 SF building originally constructed in 1965. The original operation in the building was calibration of guided weapons for aircraft. In the 1970s and early 1980s the building was used as a nosedock for F-4 - Test Aircraft Radar electronic work area. It has never had a floor drain.
This facility is currently being used to store air craft support equipment for Building 309. The shop has been used in the past for servicing, inspecting, and repairing AGE equipment, but due to the reduction in personnel, this work is currently only performed in Building 309. The need to expand the work area for AGE equipment maintenance into Building 308 in the near future is not anticipated. A current view of the building is shown below in Figure 1.

Figure 1: Picture of Bldg. 308

Facilities associated with the septic system consist of:

- Toilet
- Lavatory
- Janitorial Sink

The building is located at 340 Delaware Ave. The point of contact for this building is Ms. Vicky Cruz and Mr. Adam Ferrara, they can be reached at 575-~~475~~-5272. The hours

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of operation for this building when it is in use is one 8.5 hr shift (0630-1500) and one 9 hr shift (1500-2400), five days per week.

Industrial Wastewater Drainage: There are no floor or trench drains in this facility. A janitor's sink is located in the restroom. The sanitary sewer pipe from the restroom connects with the pipe from the restrooms in Building in 309. The effluent pipe then proceeds south to Manhole 334E the layout of this facility can be seen below in **Figure 2**. At the time of the inspection surveyors were unable to open Manhole 334E. No cross-connections to the storm sewer were identified.

Industrial Wastewater Sources/Existing Pretreatment/ Existing Management Practices: There is only once source of industrial wastewater from this facility: floor washing

Floor Washing: The floor in this facility is washed every three months using a Tennant floor scrubber, 10 gallons of water and Simple Green. Average and maximum daily wastewater flows from this activity are estimated to be less than one gallon and ten gallons, respectively. The wastewater from this activity is discharged into the French drain at Building 309; therefore, the quantity of wastewater generated by this activity is included in the flow summary for Building 309.

Existing management practices consist of sweeping the floor prior to washing it.

Site Description: Aircraft Corrosion Control
Site Specific Contingency Action Plan: See Attachment 1
Secondary Containment Routes: None
Probable Spill Route: Leaks dissipate in local area on ground
Material Compatibility: No material incompatibilities

Connected to Sewer?

Stored Substances:

Chemical	Container Type
MEK	1 gallon can
Polyurethane Paint	1 gallon can
Naptha	1 gallon can
Toluene	1 gallon can
Epoxy Primer	1 gallon can
PD-680 Type II	55 gallon drum
Waste Paint/Thinners	55 gallon drum

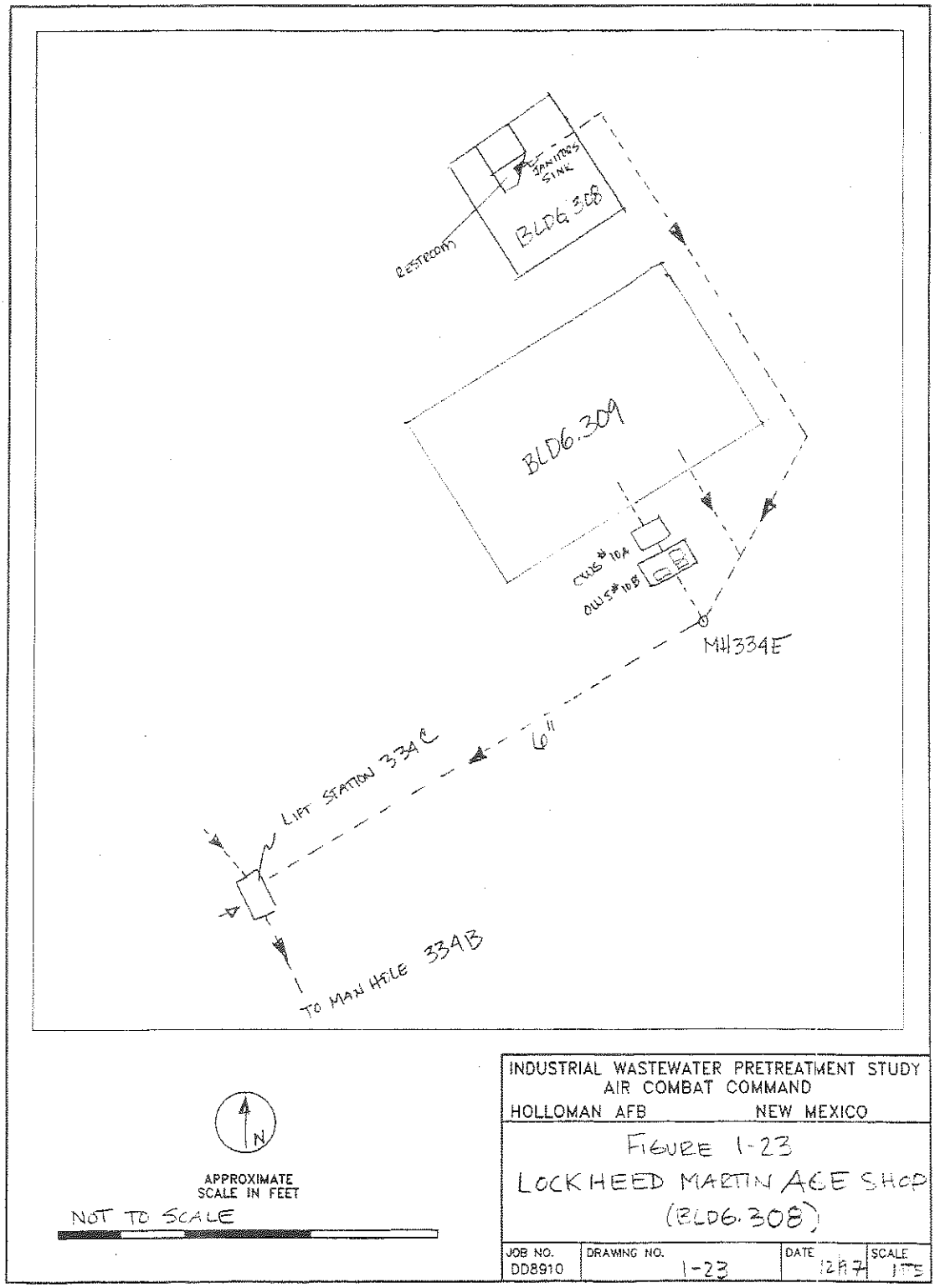

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Figure 2: Layout of Bldg. 308 and 309

INACTIVE SEPTIC SYSTEMS

BUILDINGS 920, 921, 922

These are three identical buildings constructed in 1959. Each building has 1900 SF. They were originally built for ammunition assembly which primarily consisted of bolting rocket components together prior to use. All three buildings are presently vacant and empty.
Each of the three buildings has a simple bathroom consisting of a:

- Toilet
- Lavatory

Multiple inspections were set up for this site, but no one showed up. Therefore, no follow-up information was found. Pictures of the current buildings are shown below in Figures 3-5.

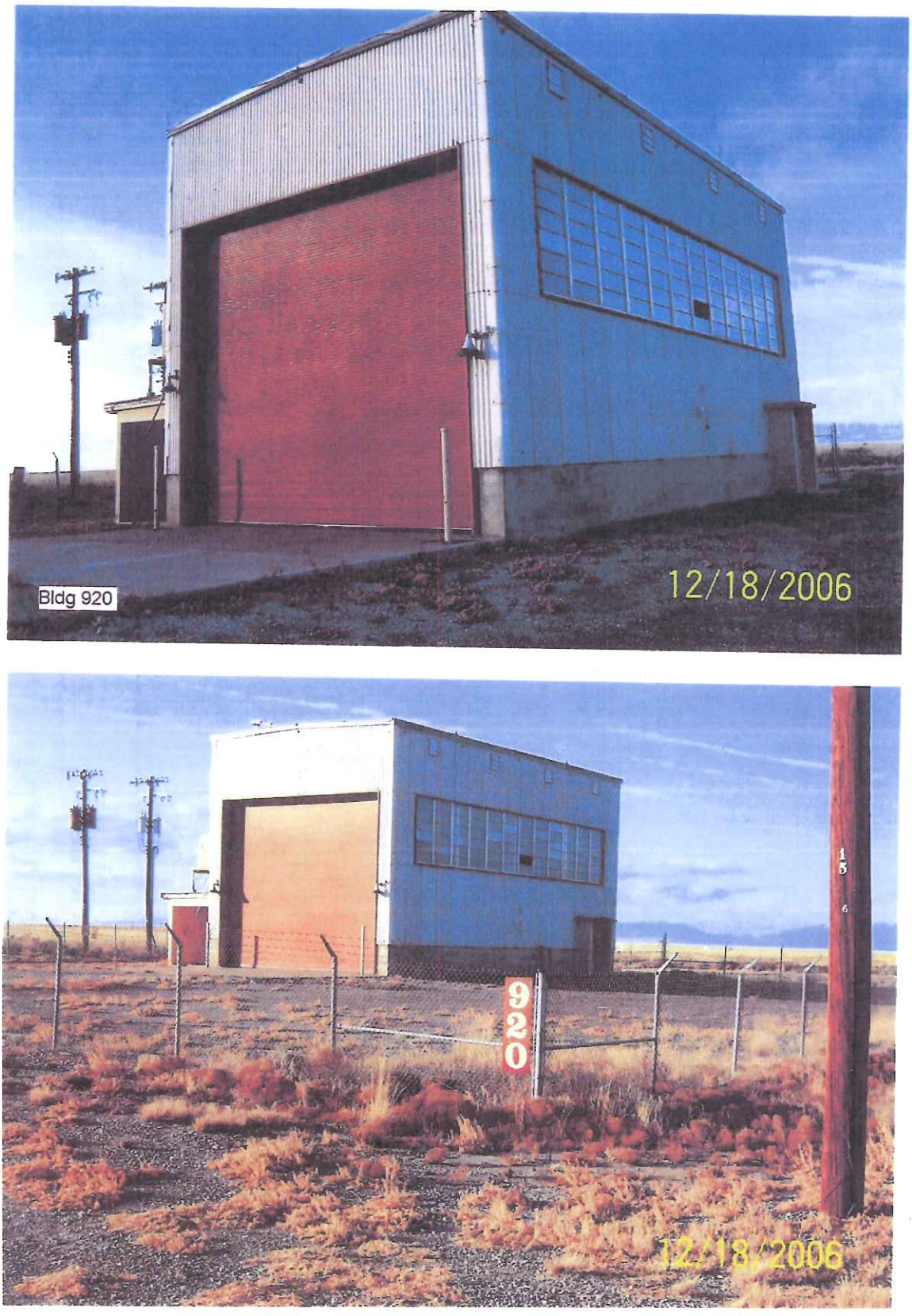


Figure 3: Pictures of Bldg. 920

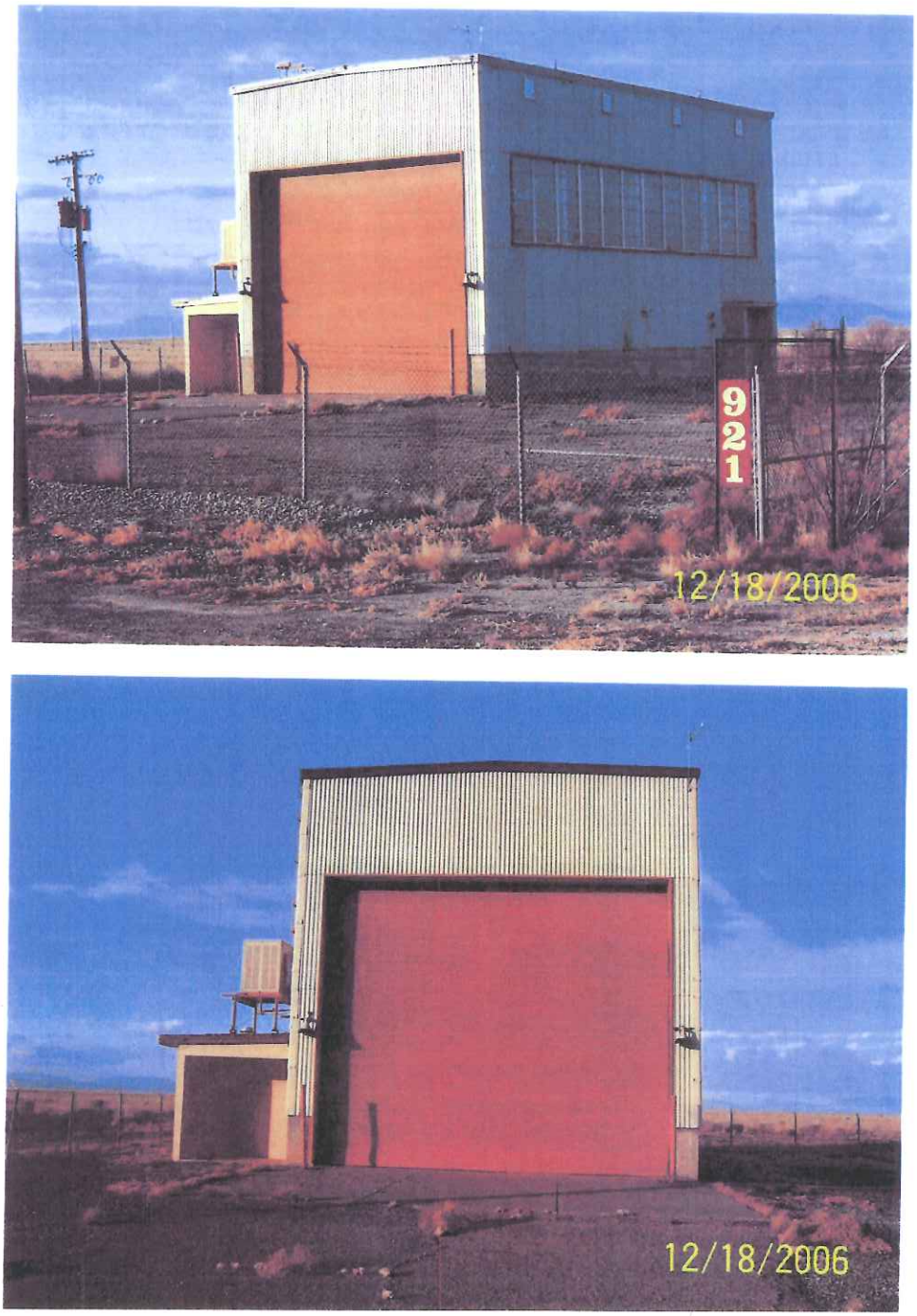


Figure 4: Pictures of Bldg. 921

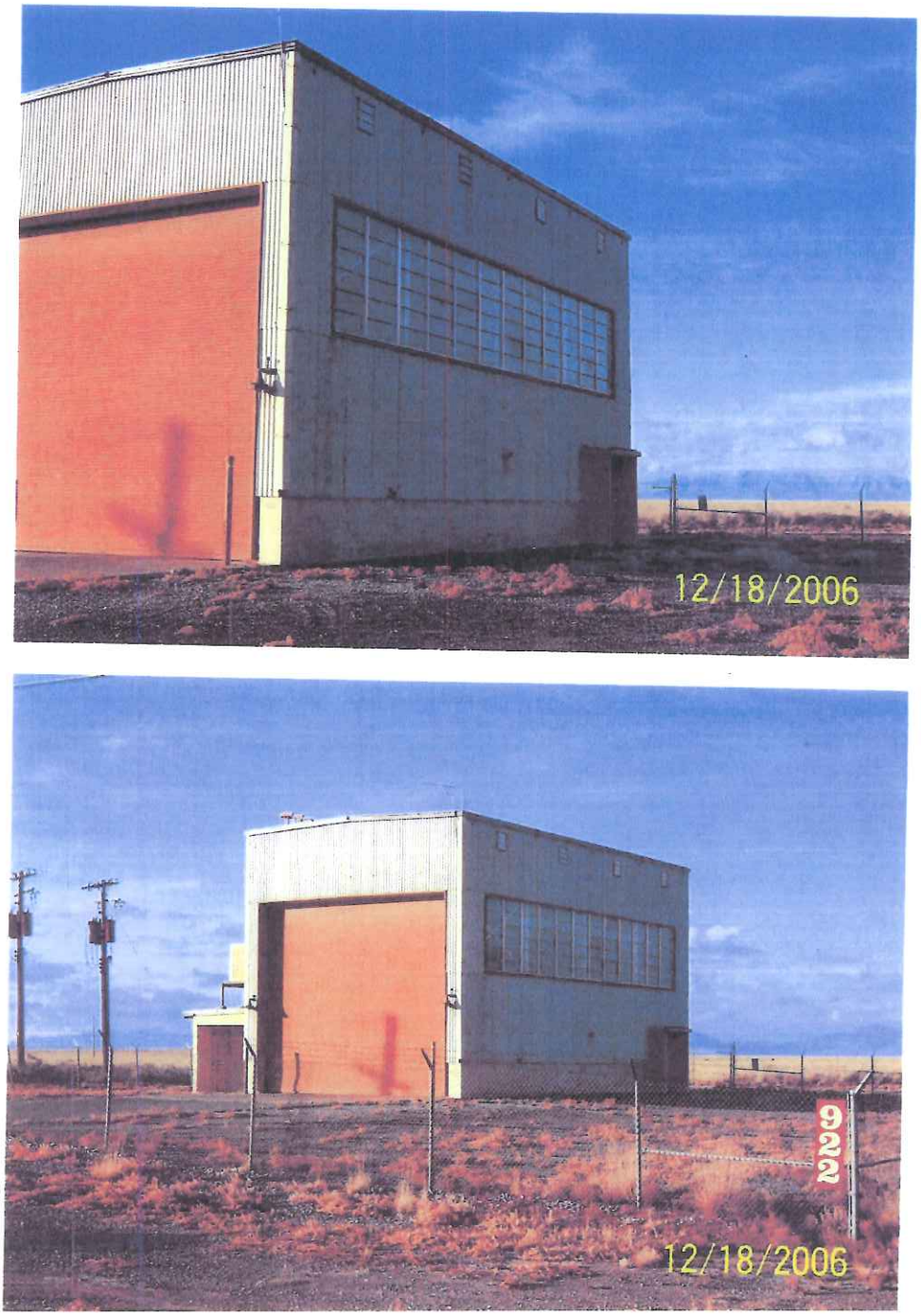


Figure 5: Pictures of Bldg. 922

INACTIVE SEPTIC SYSTEMS

BUILDING 924

This building was constructed in 1959 and has 4800 SF.
The building's original service was ammunition assembly similar to buildings 920-922.
It was later used for maintenance of radar tracking equipment.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

An on site inspection was done for this building on 20 Dec 2007 with the current facility manager, Mr. Michael Tackett. He did not have any information about the history of the septic tank system. Currently the building is being used for munitions storage. For the past two year it has stored rocket motors for the test track. From the on site inspection and drawings (Attachment 4-6) it can be seen that the bathroom drain is separate and there are no floor drains.

There are no pictures on file of this building.

INACTIVE SEPTIC SYSTEMS

BUILDING 1091

Site Description: There are no current files on this building because the building has been demolished. The building served as the Airfield Control Tower until replaced by the present Control Tower
On Attachment 55b a drawing of where the leach field was located in 1984 can be seen.
Grid Coordinates: J.9, 10.2
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: No secondary containment associated with underground storage tank
Probable Spill Route: Leakage from underground tank will contaminate water table in local vicinity

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 / UST

There were also three drawings that were discovered during the research stage of the project. The drawing (Attachment 7) shows the Septic Tank Details, Septic Tank Drain Field and the Drain Field Details.

INACTIVE SEPTIC SYSTEMS

BUILDING 1097

Specifications and history of this building are given in the following "Cold War Survey: Holloman Air Force Base". Along with this survey an on site inspection was done on 28 November 2007 with the current facility managers, A1C Clinton Bennett and TSgt Robert Edyburn. During the on site inspection it was discovered that the bathroom is separated from work area drains. In the past the building was used as a communications work center (office space) until 2005. There are no floor drains in the work area. It is currently being used as a houses base for a radio system network. There were also three drawings (Attachment 8-10) that were discovered in the investigation phase of the project. The drawings show the Materials Septic System, the Septic Tank Placement and Piping, the Latrine Plan, and the Mechanical Plumbing Plan.

Facilities in this building consist of:

- Toilet
- Urinal
- Lavatory

Description: Communications facility
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: None
Probable Spill Route: Leaks dissipate in local area on ground

Tank Location: South of facility
Fuel Flow – South/West

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 /AST
	500 gal each/ 1 /UST (Abandoned)

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Communications, Receiver.
Historic: Transmitter/Receiver.
Street Address: 1432 Sabre Road, HAFB, 88330-7842.

Building Number: 1097

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [ ] Minor [ ] Moderate [x] Major

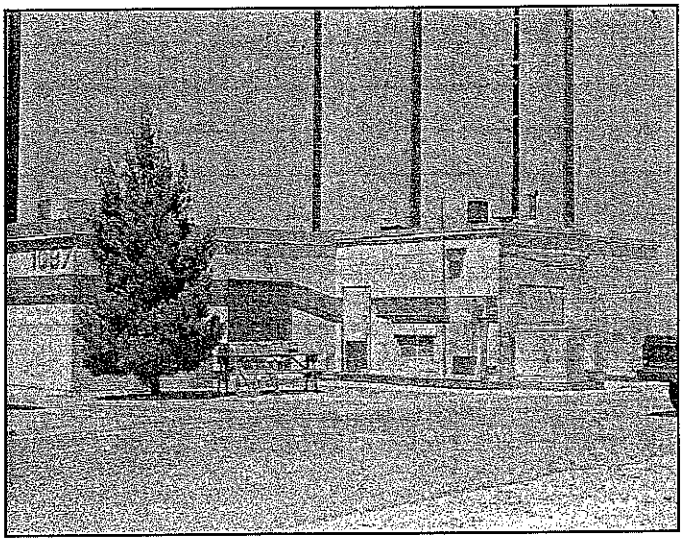
Comments:

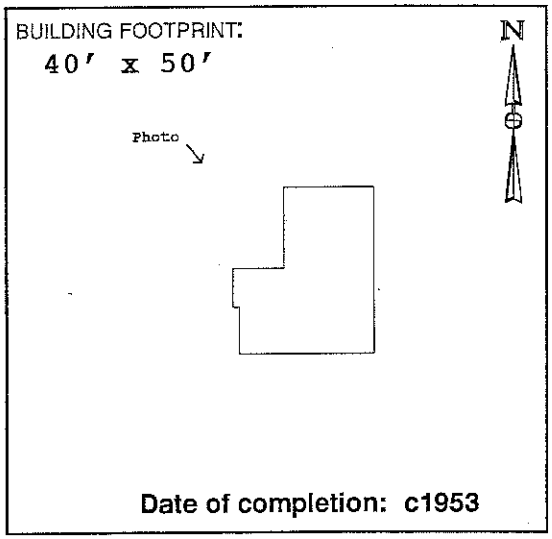
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1097 has not retained historic integrity.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1953

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1097 is a small transmitter building designed with few embellishments for utilitarian use only. Building 1097 originally had a rectangular footprint identical to Building 1098 and Building 1095. The original floor plan was sectioned into 4 rooms. An addition was constructed at the west elevation in 1986 using compatible structural and architectural components (CE File #1097-1). Both the builder and the architect are unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1097.

Current Function: Receiver/Air Traffic Control/Radio Control.

Original Function: Transmitter/Receiving/Communications.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1098-1 (c1952).

Foundation: Concrete wall footing. Concrete slab on granular fill.

Exterior walls: Painted concrete masonary units (CMU).

Roof: BUR on 2" rigid insul.; 2" poured gypsum on gyp board sup. by steel joists.

Notable interior features, including machinery:
Construction drawings document *"UHF Radio Air/Ground Facilities AN/GRC-27"*.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:
Continues to function as a communications facility/receiver site.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1097 has served as a Base communications facility since its completion c1953. Several renovations have resulted in a loss of historic integrity for this building. Building 1097 is no longer eligible for the National Register of Historic Places.

VII. ASSOCIATED BUILDINGS:

Location plan CE File #1098-2 identifies at least three north area transmitter sites. Building 1097 was associated with transmitter Building 1098. This facility is also associated with the flightline, and with communications Building 221.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building #1097 retains its original function as a radio receiver facility, however it has been modified to accommodate electrical, mechanical, and equipment additions and change-outs. Original equipment has been replaced.

Office space was added to the south elevation (1986: CE File #1097-1). All six windows at the north, east and west elevations have been blocked in. Original doors have been replaced. Vinyl floor tile covers original tile throughout. Dropped ceilings have been added.

This building, although retaining historic significance as a receiving site, has lost integrity of design, materials, workmanship, and association with its period of significance. Note: A Sgt. Boots (extension 3132) was identified by Building 1097 personnel as being a possible source for oral history research concerning specific activities associated with this facility.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Office space added to the west elevation (c1986: CE File #1097-1).

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Construction of adjacent buildings has altered viewshed.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Windows have been blocked in.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: An addition obscures the original west elevation. The original window treatments removed. Dropped ceilings added. Original asphalt floor tile covered.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: The presence of interior communications equipment and exterior poles contribute to the integrity of feeling as a radio site.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

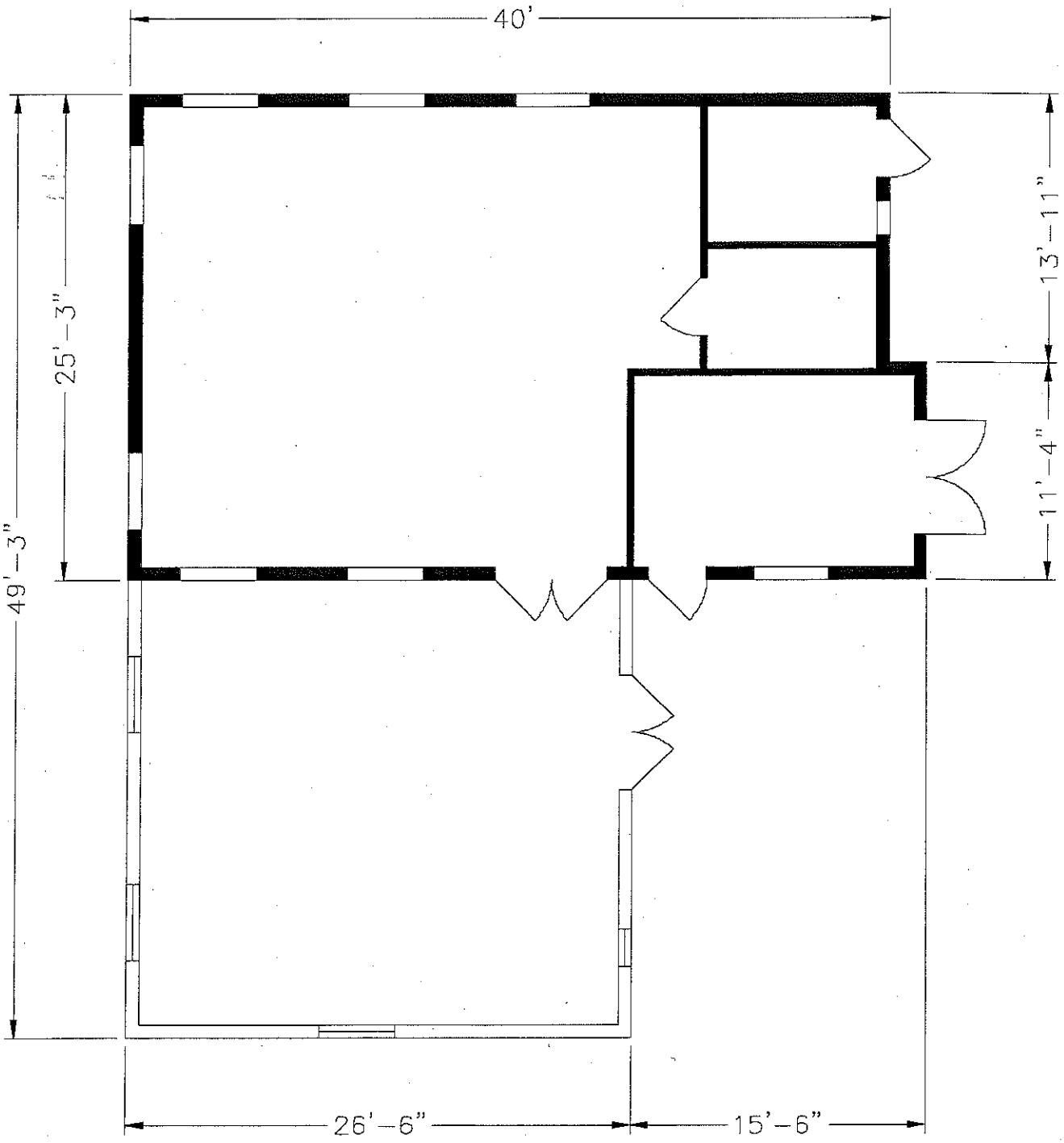
Comments: Original equipment has all been replaced.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #81**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



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Source: CE File #1098-2 (c1971)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1097** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1190

This building was constructed in 1952 and demolished in 2002. Specifications and history are provided in the "Cold War Survey".

The only drawing discovered was the plumbing floor plan and it can be seen in Attachment 11. Attachment 55d shows the current location of the leach field in 1984.

2002 Demolished Due To Unrelated Condition

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Security Police Building.
Historic: Change House/Unconventional Fuel Storage.
Street Address: 1514 Lethal Road, HAFB, 88330-7840.

Building Number: 1190

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1190 is in need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

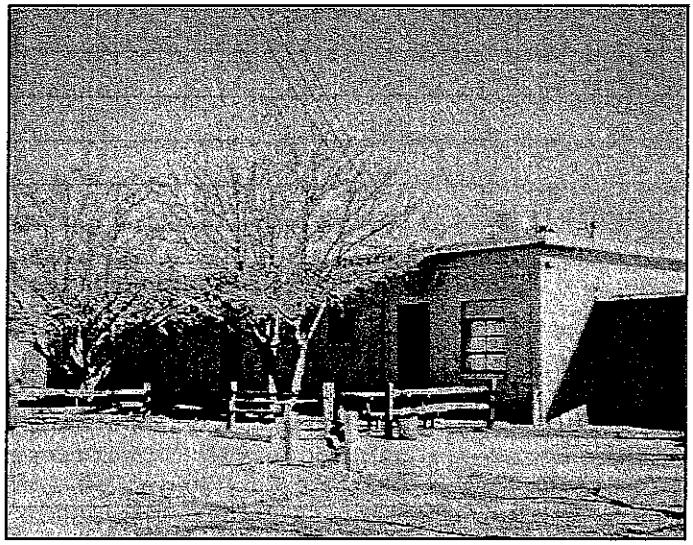
Comments: Interior partitions have been removed (date unknown).

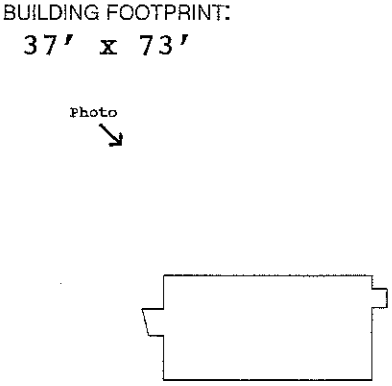
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1190 is a single-story, flat-roofed, concrete masonry unit (CMU) building exhibiting large roll-up equipment doors, numerous personnel access doors, and asymmetrical window fenestration. Construction drawings prepared in 1951 were stamped "As-built" but were not stamped in the revision block. Real Property Accountable Record/1190 indicates that Building 1190 was completed c1952 as a Change House for unconventional fuels personnel. W. C. Kruger Company (Santa Fe, NM) provided the construction drawings stored in CE File #1190. The builder is not known. A comparison of the current building and original blueprints reveals that no structural modifications to the building have occurred.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1190; CE File 1195-1 (c1951).

Current Function: Security Police operations.

Original Function: Change House, Unconventional Fuels.

Interim Functions: "RC Con House" (n.d.); "Prpln R-L Fuel/Lub" (n.d.); Prop Res Lab Rocket" (n.d.); "Prpln R-L Rkt" (n.d.); Sp Operations (n.d.).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1190-1 (c1951).

Foundation: Poured concrete footings and grade beams; concrete slab.

Exterior walls: Concrete masonry units (CMU).

Roof: (Built-up) gravel on rigid insul.; 2" slab sup. by metal lath and steel joists.

Notable interior features, including machinery: Shower stalls, locker room, dressing room, and laboratories.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

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VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Recommend reassessment of Building 1190 once the fifty-year construction date is met in the year 2002. This building retains historic integrity.

VII. ASSOCIATED BUILDINGS:

According to CE File #1190-1 *Title Sheet*, Unconventional Fuels Storage Building 1190 was associated with Building 1194 (Booster Inspection), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

This building retains all aspects of historic integrity. Although not meeting the "exceptional importance" standard imposed on buildings constructed within the last fifty years, Building 1190 remains potentially eligible as an individual property once the fifty-year date of construction is met in the year 2002. Recommend inclusion in a Multiple Property nomination along with the other unconventional fuels storage buildings. Building 1190 is currently being used as a storage and administrative facility by the 49th Squadron Security Police personnel. The original shower stalls, dressing room, locker room, shop, tools and supply rooms are all used for storage. Free-standing shelves have been installed to accommodate storage. As a result, some original doors and windows are blocked from view. Minor alterations have occurred at the interior. Two partitions have been removed. Glazed tile walls appear to have been added to at least one office. Vinyl tile has been installed over one section of the concrete slab in what once served as a machine shop. Some of the window panes have been painted. Because this facility remains potentially eligible, recommend that the original design features be considered in future modifications, and that photographs document any changes to the essential features. Suggested routine maintenance: Prune trees away from principal facade. Noticeable water damage warrants inspection of the roof. Replace broken window panes. Repair hole at exterior south elevation wall.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: Interior room layout as a Change House remains a key design element. This layout includes large open interior spaces, smaller labs/offices, and showers, dressing, and locker rooms used by unconventional fuels personnel.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Although no longer used as such, Building 1190 continues to be situated in the vicinity of other buildings historically associated with unconventional fuels testing and storage. This building appears to been recently landscaped.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two interior partitions removed. Glazed tile walls in office rather than CMU shown on original drawings.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Nearly all original workmanship remains visible, particularly at exterior.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Aside from the change in operations occurring here, Building 1190 remains essentially as it was originally constructed.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

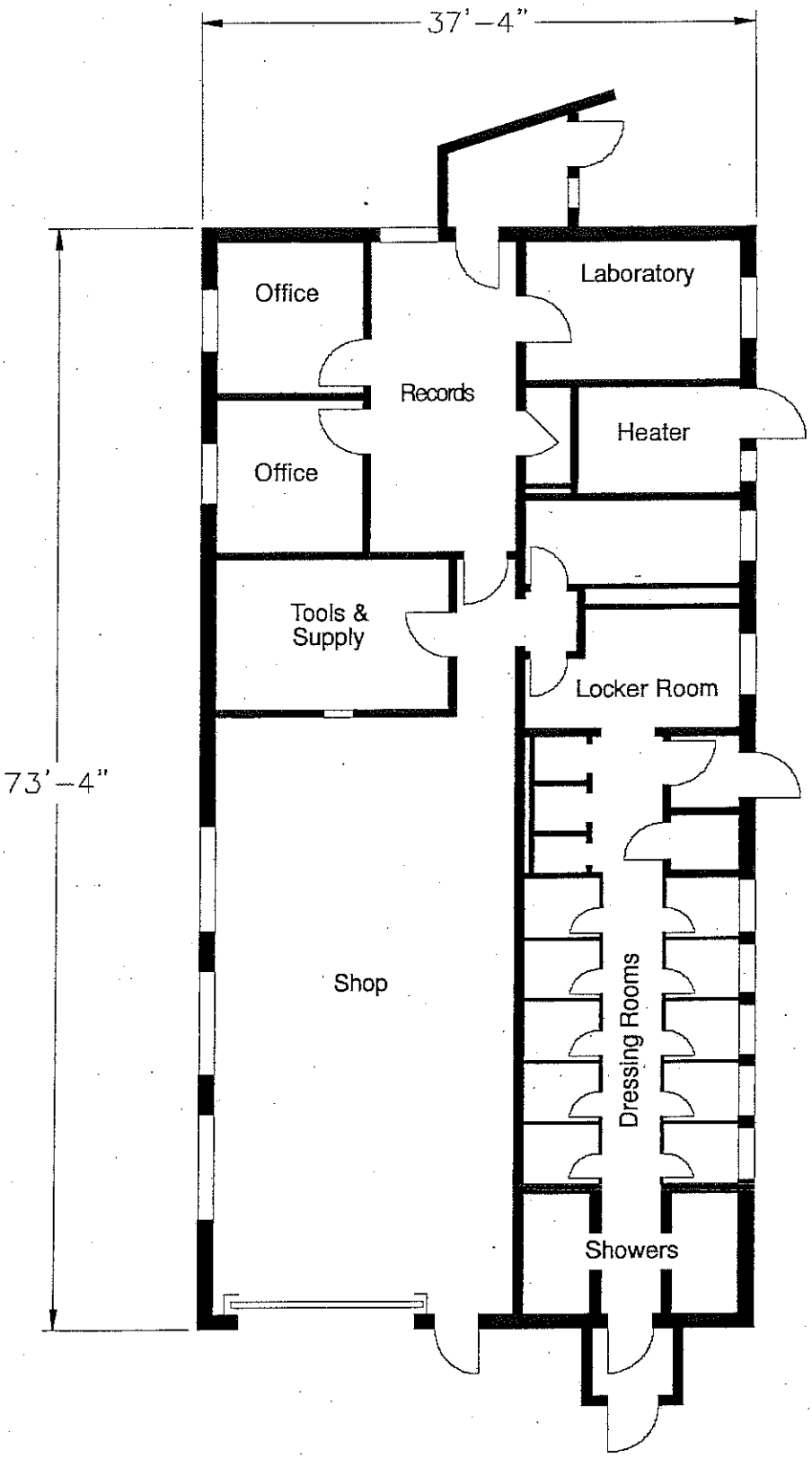
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #-Photo #**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1190-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1190** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Mike Gardner* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1194

Specifications and history are given in the "Cold War Survey".
Facilities in this building consist of:

- Toilet
- Lavatory

An on site inspection was done on 7 Jan 08 with the current facility manager, SSgt Joshua Roberts. In the inspection it was noted that the bathroom is separated from the work area drain. There was no history known. The building is currently being used for storage and it has been used for storage and has been used for storage for the past ten years.
Attachment 55d shows where the leach field for Bldg.1194 was located in 1984.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME: **Building Number:**

Current: Research Equipment Storage.

Historic: Booster Inspection/Unconventional Fuel.

Street Address: 1584 Lethal Rd., HAFB, 88330-7840. **1194**

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1194 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

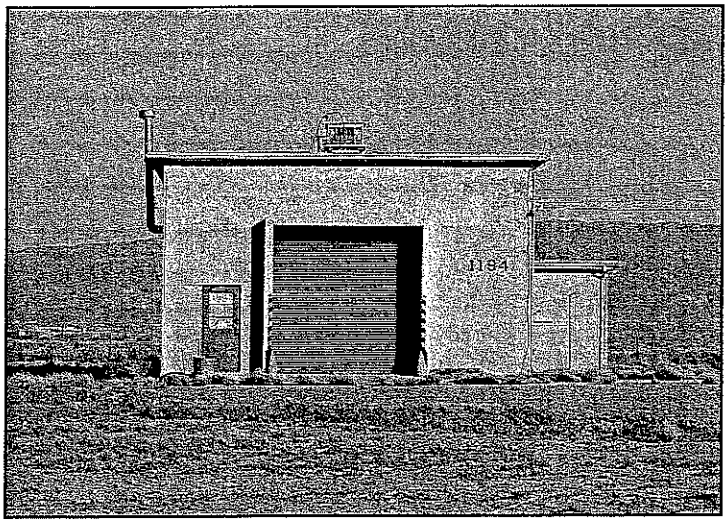
Comments: Interior partitioning is reversible.

Preliminary Determination of National or State Register Eligibility:

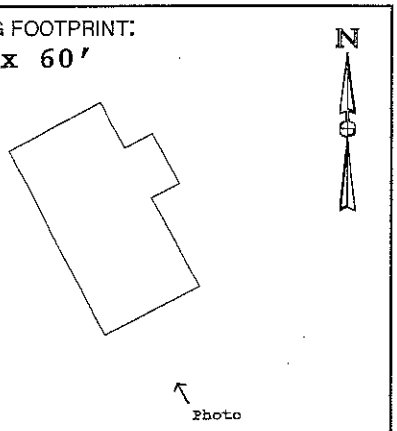
[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.



BUILDING FOOTPRINT:
30' x 60'



Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1194 is a rectangular, single-story, high bay structure made of concrete masonry units (CMU) and exhibiting a flat roof. The principal elevation faces west, showing one large roll-up door, and one personnel door. One row of windows is located below the eave line at the north and south elevations. The ceiling at the interior is exposed. "As-built" construction drawings show that Building 1194 was completed in 1952. W. C. Kruger Co. (Santa Fe, NM) provided the architectural work (1952: CE File 1194). The builder is unknown. No structural modifications to the original structure were noted.

III. HISTORIC AND CURRENT USE:

Current Function: Research equipment storage.

Original Function: Missile Assembly Test Building/Booster Inspection.

Interim Functions: "Mls/Space Rsch Tst" (n.d.); "M/Assembly Test Bldg" (n.d.); "Shp Wpn and Rlse Sys" (c1976); "BE Stor Cv Fclty" (n.d.); "Rsch Equip Stor" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1195-1 (c1952).

Foundation: Poured concrete footings and stem wall. Slab on compacted fill.

Exterior walls: CMU between concrete columns and bond beams.

Roof: BUR gravel. Rigid insulation. 2" concrete deck supported by steel joists.

Notable interior features, including machinery:

4-ton Wright Company chain-operated crane and hoist system, hoist no. 5197, serial no. 4925. The hoist is attached to a runway "I"-beam (crane) supported by steel support beams. Large metal roll-up doors at east and west elevations.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

210

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1194, although not meeting the "exceptional importance" standard, may be eligible for the National Register for its role in early Cold War materiel development once the fifty-year construction date is met in 2002.

VII. ASSOCIATED BUILDINGS:

According to CE File #1195-1 (c1951) *Title Sheet*, Building 1194 was associated with Building 1190 (Change House), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1194 remains essentially as it was constructed c1952. The original floor plan layout included one main room and an equipment room. A small area in the northwest corner of the main room has been partitioned. No documentation was found pertaining to this modification. This minor partitioning of the main room is reversible. This building is no longer associated with either missile assembly and test activities or unconventional fuels storage, and currently serves as an equipment storage room for the 6585th Test Group. Construction drawings (1956: CE File # 1194-1) show that an addition to this building was planned. There is no indication that this addition was ever built. Because this building retains historic integrity, and may be eligible for the National Register under Criteria A and/or C once the 50-year construction date is reached in the year 2002, recommend that future modifications take essential design features into account. Note: One isolated occurrence of prehistoric artifacts was noted on the grounds north of the building, including one white chert core, and one secondary chert flake.

Suggested routine maintenance: Scrape, prime, and paint the exterior. Replace downspouts. Prune landscape plantings away from foundation.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Construction drawings show plans for an addition to the north elevation (1956: CE File #1194-1). There is no evidence that this addition was ever built.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The high open-bay floor plan allowing the crane and hoist system, and the large metal equipment roll-up doors remain as key design elements.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Buildings 1193 and 1194 remain in an unmodified and isolated setting.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Nearly all of the historic materials used to construct this building remain visible.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two doors have been replaced. All windows appear to be original. Interior partitions at the northwest corner divide the original floor plan.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Although retaining its original open floor plan, this building is currently used for storage of modern equipment.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

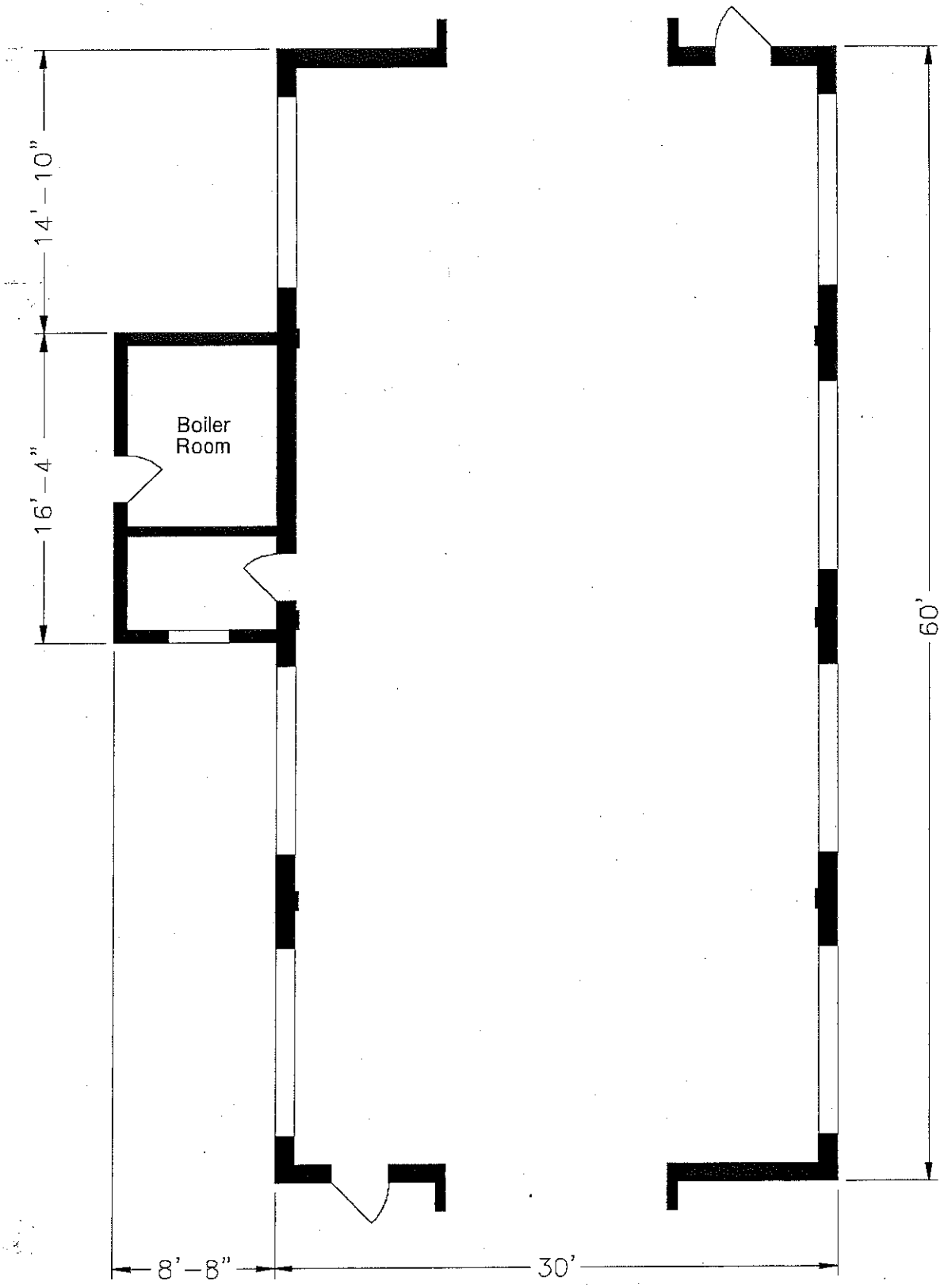
Comments: The open floor plan, isolated setting, hoist system, and nearby continuity check stand (Building 1193) contribute to this building's integrity of association.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #3-Photo #31**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1195-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1194** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1196

This building was constructed in 1956. It originally built for missile assembly, but is now in communications equipment storage.
The original facilities consisted of:

- Toilet
- Lavatory

These facilities were replaced in 1975 with:

- Toilet
- Urinal
- Lavatory

An on site inspection for this building was done on 4 Dec 07 with the current facility manager Sgt Lander. The information gathered from this inspection was that there were not any floor drains located within the building. In the past it was used for TAC can and for the past ten years it has been used for storage.
Attachment 55d shows where the leach field for Bldg. 1196 was located in 1984.

Figure 6: Picture of Bldg. 1196

INACTIVE SEPTIC SYSTEMS

BUILDING 1199

This building was constructed in 1957. It was originally built as a rocket fuel laboratory. In 1987 it was converted to the Security Forces Kennel.
As the fuels laboratory, it contained:

- Toilet
- Urinal
- Lavatory
- Shower

After conversion to the kennel, the facilities were changed to:

- Toilet
- Urinal
- Stainless Steel Sink

During the investigation stage of the project there were drawings found for building 1199. Attachment 12 and 13 are of the Site Plan, the Sewer Isometric, the Plumbing Plan and the Floor Plan.

Along with the drawings that were found an on site inspection was completed on 29 Nov 07 with the current facility manager, SSgt Gilmore. A new Security Forces Kennel area has been built and now the building is currently being used to house animals until they can be transferred to Alamogordo Animal Control.

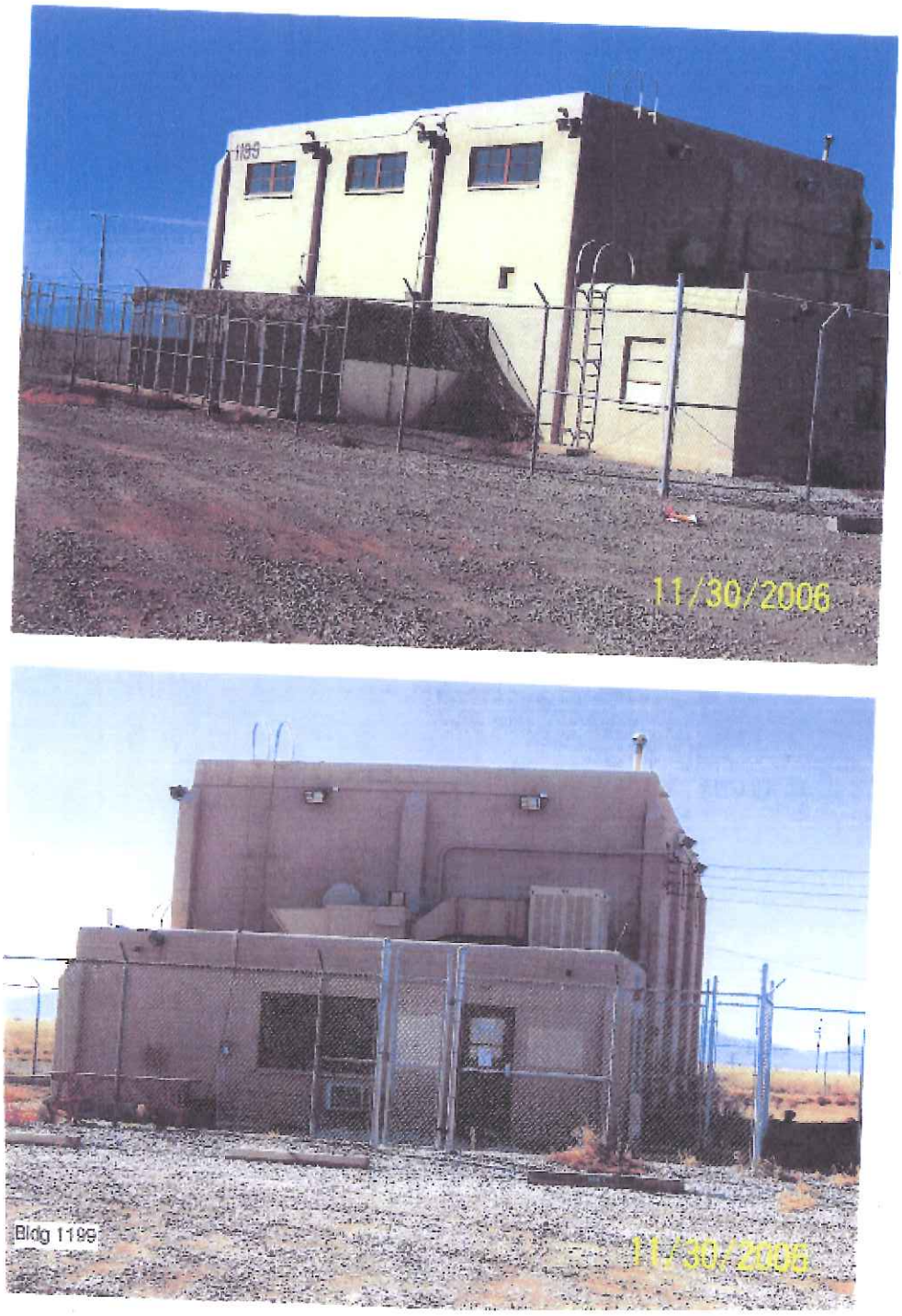


Figure 7: Pictures of Bldg 1199

INACTIVE SEPTIC SYSTEMS

BUILDING 1200

Specifications and History: See "Cold War Survey".

Three drawings were found for this building. These drawings show the Plumbing Floor Plan (Attachment 14), a Floor Plan (Attachment 15) and the Septic Tank and Drain Field (Attachment 16).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab, Medical (VACANT).
Historic: Space Biology Laboratory.
Street Address: 841 Douglas Road, HAFB, 88330-7823.

Building Number: 1200

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [ ] Needs maintenance [x] Deteriorated [ ] Archaeological

Comments: Building 1200 is abandoned, and showing signs of deterioration.

Degree of Alteration: [ ] None [ ] Minor [x] Moderate [ ] Major

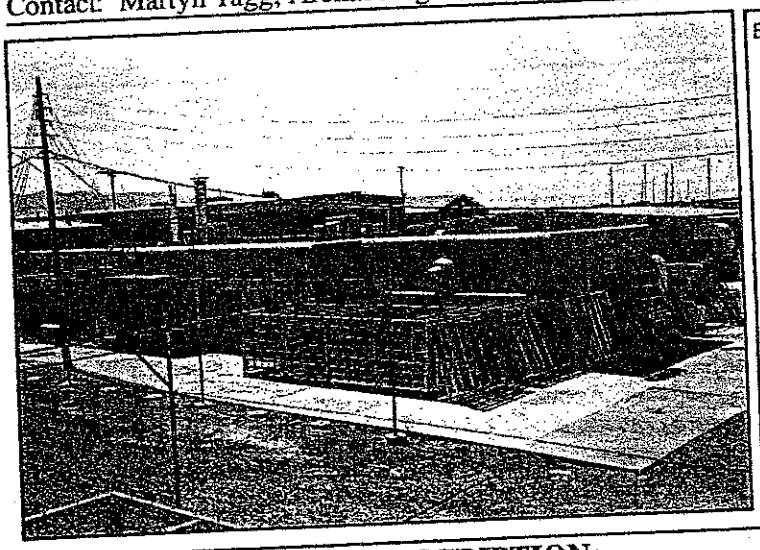
Comments: Alterations are architectural rather than structural.

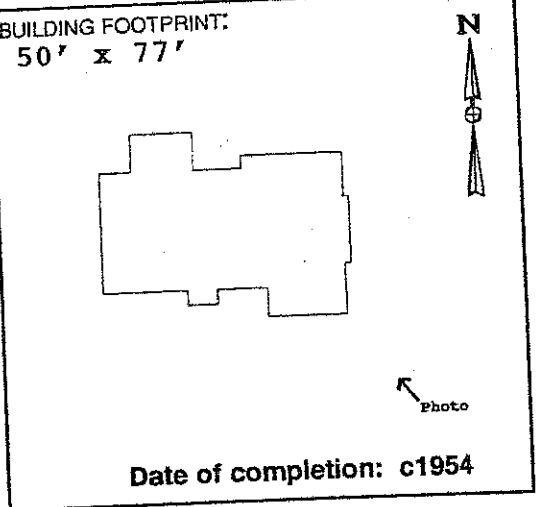
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1200 no longer retains historic integrity. See Section VI.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1954

273

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1200 is a rectangular, single-story, flat-roofed concrete masonry unit (CMU) building constructed as one of several laboratories dedicated to important aeromedical research using both animals and humans. None of the construction drawings were correctly stamped "As-built." According to Real Property Accountable Record/1200, the estimated date of construction is 1954. Subsequent improvements documented in CE File drawer #1200 include an addition to the medical lab (c1958), a covered passageway added to the boiler room (c1957), and a frame wall addition to the surgery room (c1957). Neither the builder nor the architect is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1200; Field visit Summer 1995.

Current Function: Vacant.

Original Function: Space Biology laboratory/Animal experimentation.

Interim Functions: Animal experimentation/Storage.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1200-1 (c1953).

Foundation: Concrete wall footings. Concrete slab on fill.

Exterior walls: Painted concrete masonry units (CMU).

Roof: BUR on concrete deck, supported by metal lathe and steel bar joists.

Notable interior features, including machinery:

Originally used as a medical laboratory, with work tables, work benches, built-in lockers, cabinets, operating tables, x-ray tables, etc.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:

274

One room is currently being used for storage. All medical and laboratory equipment has been removed.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Due to extensive alterations to the exterior, Building 1200 no longer retains historic integrity. Recommend, however, that this building be considered as a contributing feature in a basewide early Cold War National Register of Historic Places Multiple Property nomination.

VII. ASSOCIATED BUILDINGS:

Building 1200 was an integral part of Holloman's aeromedical facilities, including Buildings 1201, 1202, 1203, 1204, 1205, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Since its original construction c1954, Building 1200 has been used as a laboratory and medical facility for a wide variety of research animals, including trout, black bear, dogs, mice, and chimpanzees. Although currently abandoned, this building featured a lead-lined x-ray room, an autopsy room, an observation room, a surgery room, a dark room, and animal pens (c1954: CE File #1200-1). Built-in steel lockers, metal cages, x-ray tables, work benches, food bins, operating tables, scrub sinks, surgical lamps, sterilizers, etc. have been removed. Two exterior doors have been blocked in, and thirteen exterior windows have been blocked in. One exterior door and one exterior window have been added. Interior walls have been added, removed, or relocated. A storage room has been added to the south elevation. Animal cages remain at the west elevation. The presence of dead rodents, foul odors, torn pipe and duct insulation (possible containing asbestos) and peeling paint (possible lead-based) represent hazards to health and safety. Because of the unique and important nature of the research conducted here, recommend that this building be nominated as a contributing feature as part of an HAFB early Cold War National Register Multiple Property nomination.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?
[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.
Comments: The building has been located at its present location since c1954.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?
[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact
Comments: Most of the original doors and windows have been removed. All of the equipment has been removed. Most of the original finishes have been obscured.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting
To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting
Comments: Continues to be situated in an isolated setting with the other Aeromedical facilities.

Materials: To what extent have the original materials used to construct this structure been retained?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Elevations have changed due to modified openings, an addition, and a covered passageway. Interior wainscot and cornice removed, wall tile added.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Exterior walls and cages remain intact. Some architectural features remain. Most of the original interior workmanship has been lost.

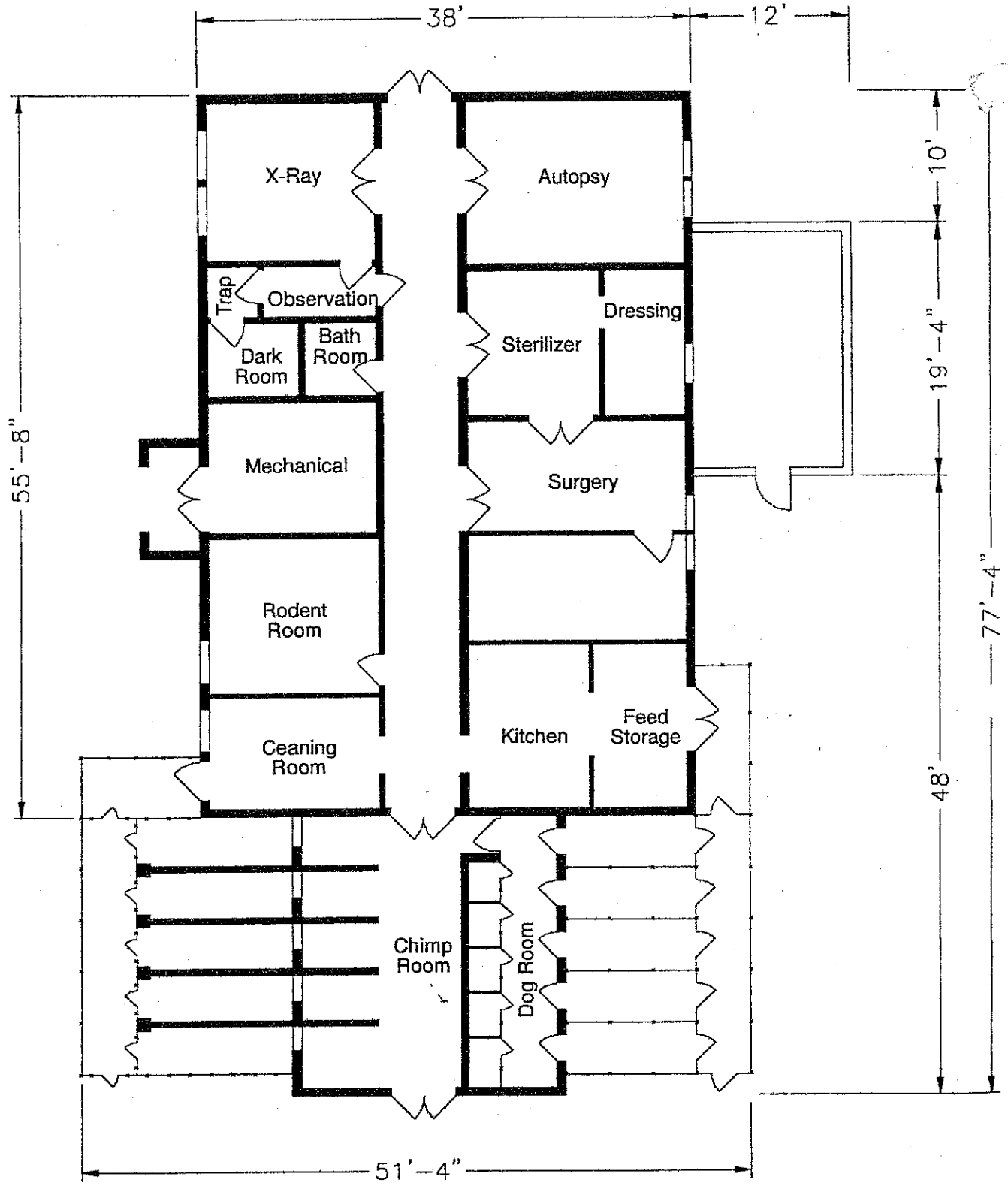
Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?
[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity
Comments: Building 1200 continues to be situated within the compound set aside for animal research. Chimpanzee research continues today in nearby buildings.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?
[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity
Comments: Although all of the equipment has been removed, this building still demonstrates a link with its past by virtue of its setting, the odors, and the animal cages.

X. FURTHER INFORMATION:

Surveyed By:
Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #94**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1200-1 (c1954)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1200** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

BUILDING 1201

Specifications and History: See "Cold War Survey"

Seven drawings were found for this building. These drawings show the Septic Tank and Absorbent Area Layout, Isometric Sewer Layout, Septic Tank Plan and Septic Tank Elevation (Attachment 17), Floor Plan (Attachment 18), Layout Plan (Attachment 19) and Systematic-Waste System (Attachment 20).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab Medical.
Historic: Aero. Medical Field Lab.
Street Address: 821 Douglas Road, HAFB, 88330-7823.

Building Number: 1201

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Structurally intact. In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

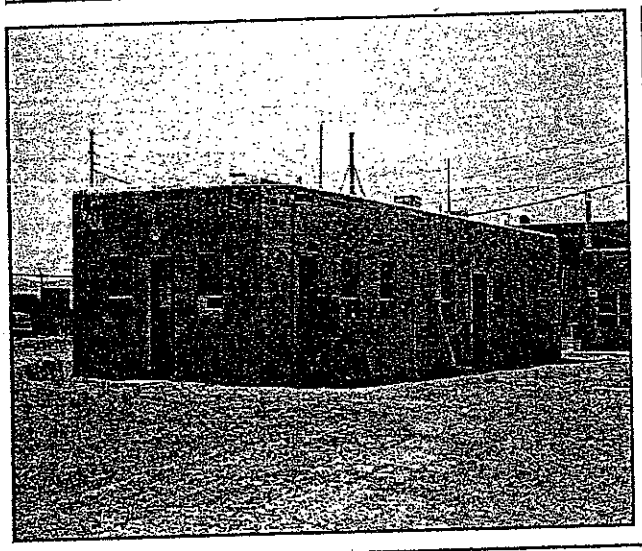
Comments: Mortuary/autopsy room added as subsequent improvement c1958.

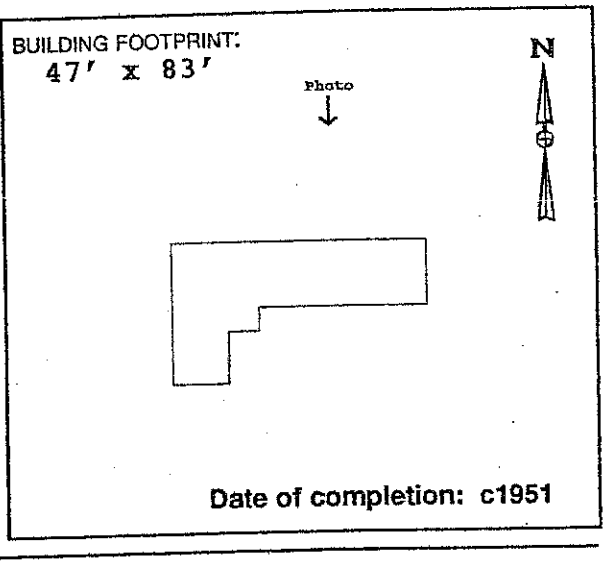
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible under Criteria A and/or C at a national level.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1951

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1201 is an "L-shaped", single-story, flat-roofed, building constructed primarily using painted 8" structural clay tile and exhibiting asymmetrical door and window placement. Animal cages occupy the west elevation. Real Property Accountable Record/1201 indicates that this science laboratory was constructed c1951. The construction drawings consulted were stamped "As-Built," although no date was given. Both the architect and builder are unknown.

At least two structural modifications may be viewed as subsequent improvements to the original building, including the addition of a Mortuary/ Autopsy Room (c1958: CE File #1201-4), and the addition of a rooftop observation deck (c1952: CE File #1201-5).

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1201.

Current Function: Carpentry shop; Employee break room; Office space.

Original Function: Aerospace Medical Lab; Animal experimentation.

Interim Functions: "SC Lab Human Eng" (n.d.); "SC Lab Med (c1968).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1201-1 (c1951).

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted structural clay tile.

Roof: Built-up roof w/ gravel on sheeting, supported by 2x12 wood joists.

Notable interior features, including machinery:

Fixed chain link cages, lab tables, equipment tables, work tables, wood storage bins, sterilizer, incubator.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL: (Based on field visit Summer 1995

[c1958 SUBSEQUENT IMPROVEMENT--MORTUARY/AUTOPSY]:

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted cement masonry unit (CMU).

Roof: 5-Ply built up roof on concrete slab. Steel joists.

278

Notable interior features, including machinery:

Washer and dryer, kitchenette, tool room, table saw, furniture, lockers.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1201 is eligible to the National Register under Criteria A and/or C at a national level of significance for its vital role in early aeromedical research in support of the early Cold War space exploration mission.

VII. ASSOCIATED BUILDINGS:

Building 1201 was associated with the other Aeromedical facilities, including Buildings 1200, 1202, 1203, 1204, 1205, 1206, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1201 retains historic integrity as far as the structure itself goes. Very little physical evidence remains of this structure's original use as an animal laboratory. The cages have been removed. Two interior walls with doors have been added. One interior wall has been removed. Service sinks, work tables, wooden bins, an incubator, and other lab support items shown on c1951 construction drawings have been removed. An area of the original roof approx. 10' x 13' was reinforced with three inches of concrete for observation deck c1952 (CE File #1201-5). A mortuary/autopsy room was added c1958. These additions may be viewed as early improvements, and do not diminish Building 1201's historic integrity. Drawings itemize a "2-body" mortuary room, an autopsy table, a band saw, cabinets, a sterilizer, a photography area, and other laboratory equipment. This equipment has been removed. This room currently serves as a lounge area for employees. Due to the important research conducted here in support of this nation's space program, further research is warranted. Recommend that Building 1201 be included in a Cold War-era Multiple Property nomination. Suggested routine maintenance: This building is showing the signs of long-term neglect. Fill the stress cracks at the exterior corners. Scrape and paint exterior walls. Replace window glass and door hardware as needed.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Continues to be situated in an isolated compound.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Original structure essentially intact. Interior lab equipment and cages removed.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Enclosed by chain link fence topped with barbed wire, along with other research facilities. Chimpanzee research continues in nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Clay tile walls still intact. Some glass block windows remain. Some glass block windows blocked in when addition constructed. Floor tiles removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Roof, walls, and exterior openings remain essentially the same. The east elevation changed due to an early addition. Interior partitions, openings, and finishes have changed.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Historic photographs show that the natural, historic, and aesthetic character of Building 1201 has been retained.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

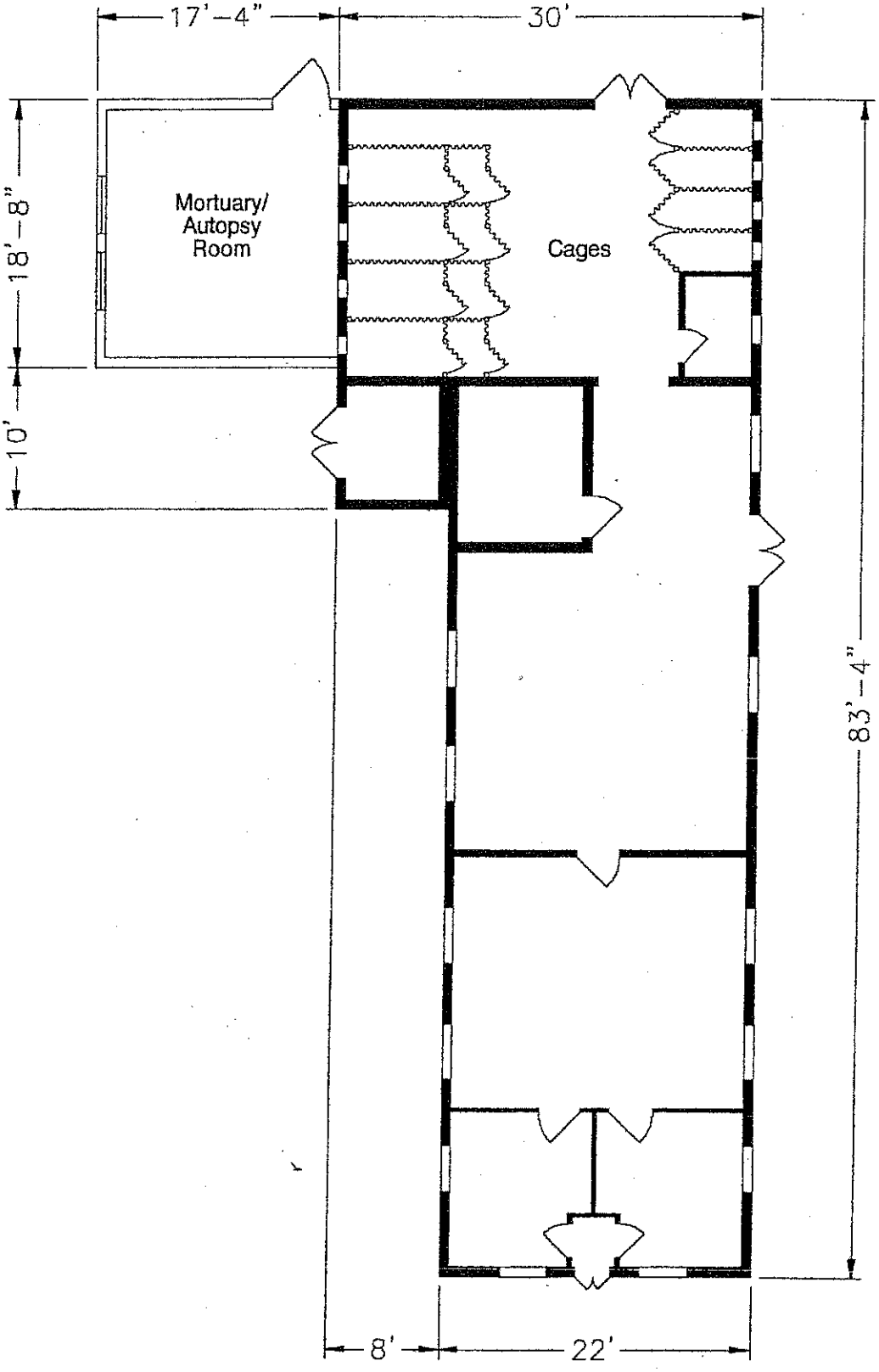
Comments: Building 1201 retains a visible link with its period of significance.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #91**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1995**



280

Source: CE File #1201-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1201** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

Buildings 1219, 1221, 1235 and 1239
An on site inspection was completed on 20 Dec 07 with the current facilities manager, TSgt Pote, he has been the facilities manager for the past nine years. During the inspection it was discovered that there are sink holes on all leach fields in the compound. All buildings in this compound have separate drains for the bathrooms. All buildings are also currently connect to the base sewer system.
Attachment 55d shows the leach field location for Buildings 1219, 1221, 1235 and 1239.

BUILDING 1219

This building is the Administrative Offices for the Munitions Maintenance Squadron. It was constructed in 1985 and covers 4476 SF.
There are Men's and Women's Bathrooms that discharged into two (2) septic tanks prior to the installation of a sewer main that discharges to the Base Waste Water Treatment Plant.

INACTIVE SEPTIC SYSTEMS

Building 1221

This building is in the Ammo Depot and was originally constructed for ammunition storage. It was later switched to store inert munitions.
The building was constructed in 1983 and covers 2857 SF.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan (Attachment 21), Floor Plan (Attachment 22), Partial Plan (Attachment 23), Septic Tank Details and Sewage Disposal System (Attachment 24) and a Profile of Sewer Line Septic Tank and Disposal Field (Attachment 25).

INACTIVE SEPTIC SYSTEMS

BUILDING 1226

This is a munitions maintenance shop building constructed in 1985. It has 2945 SF of floor space.
Facilities installed include:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Utilities Plan (Attachment 26), Plumbing Demolition Plan (Attachment 27), Plumbing and HVAC Plan (Attachment 28) and Waster/Water Piping Detail (Attachment 29).

In Figure 8 on the following page it can clearly be seen where the leach field is in relation to where building 1226. This is the leach field for building 1219, 1221, 1235 and 1239 as well. In Attachment 46 (a map showing many of the building on Holloman AFB) it can be seen where building 1226 is in relation to these building.

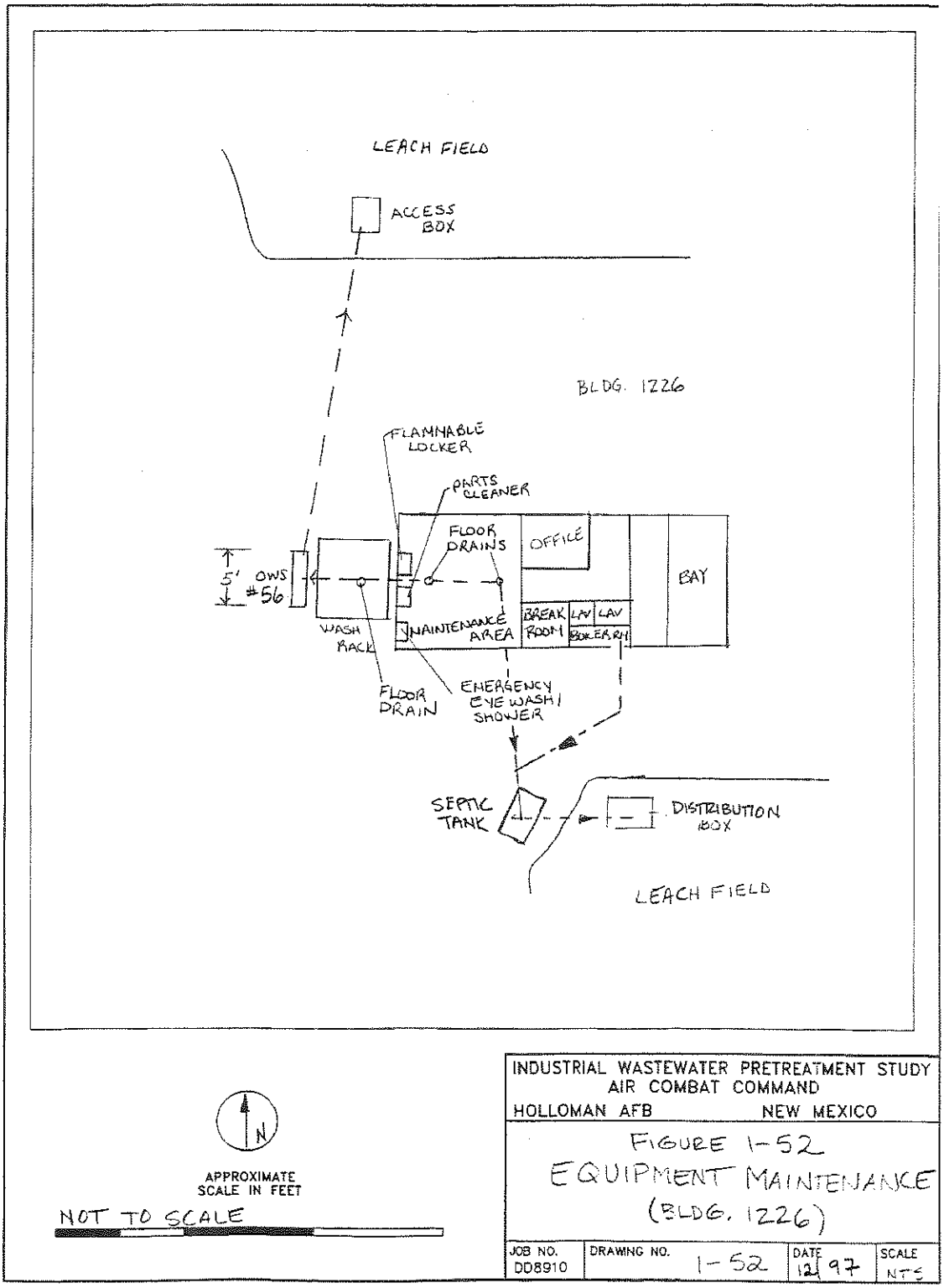


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Figure 8: Drawing of Leach field

INACTIVE SEPTIC SYSTEMS

BUILDING 1235

This building was constructed in 1964 and contains 3000 SF of floor space.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, a drawing for this building was also located. This drawing (Attachment 30) shows the Site Plan, Septic Tank Details and Sewer Clean Out.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST

INACTIVE SEPTIC SYSTEMS

BUILDING 1239

This is another building in the Ammo Depot. It was constructed in 1971 and contains 1920 SF.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Urinal
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan, Septic Tank Details, Utility Plan (Attachment 31), Floor Plan (Attachment 32), Grading Plan (Attachment 33) and Lavatory Detail (Attachment 34).

INACTIVE SEPTIC SYSTEMS

BUILDING 1250

This building was constructed in 1957 and contains 2890 SF.
It was originally a water pumping station. In 1985 it was changed into a storage facility. As part of the change in service the bathroom facilities were removed. Currently it has a large infestation of vectors and it is unsafe to go inside. The POC for this building is Mr. Chuck Price.
The original facilities consisted of:

- Toilet
- Lavatory
- Floor drains for the water pumps

INACTIVE SEPTIC SYSTEMS

BUILDING 1251

This building was constructed in 1965 and contains 1300 SF.
In the records it is listed as a Research and Testing Shop. It currently has a large infestation of vectors, therefore it is not safe to go inside. The building has been vacant since the mid 90's. The point of contact for this building is Mrs. Eisele.
It contains the following facilities:

- Toilet
- Lavatory

INACTIVE SEPTIC SYSTEMS

BUILDING 1269

This building was constructed in 1966 and contains 3262 SF.
The original service was a Medical Science Laboratory. It has been relegated to a storage facility.
The facilities consisted of:

- Toilet
- Lavatory
- Kitchen Sink with Garbage Disposal

Site Specific Contingency Plan: See Attachment 1

Max. Spill Quantity (gal): 55

Chemical	Container Type
Benzene	NA
Acetonitrile	

REMOVED SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	1102	1952	6'x4'x8'10"	2500
2	1103	1948	7'x9'x3'2"	1412
3	1108	1958	6'x9'6"x6'3"	750
4	1119			
5	1150	1953	4'x9'x6'3"	2500
6	1154			
7	1166	1960		450
8	1175	1949	5'1"x10'4"x6'10"	2970
9	1176	1959		640
10	1265	1992		1200
11	1173			

REMOVED SEPTIC SYSTEMS

BUILDING 1102

Specifications and History: See "Cold War Survey." More information can be seen in the drawings. The drawings that have been found for this building are as follows the Grading Plan (Attachment 35), Septic Tank Details and Boring Log Results (Attachment 36), Leaching Well and Cover Details and Sewer Clean Out (Attachment 37).

Attachment 55c shows where the leach field was located for this building in 1984.

This building has the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Missile Radar Station.
Historic: Radar Triangulation: King I.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1102

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

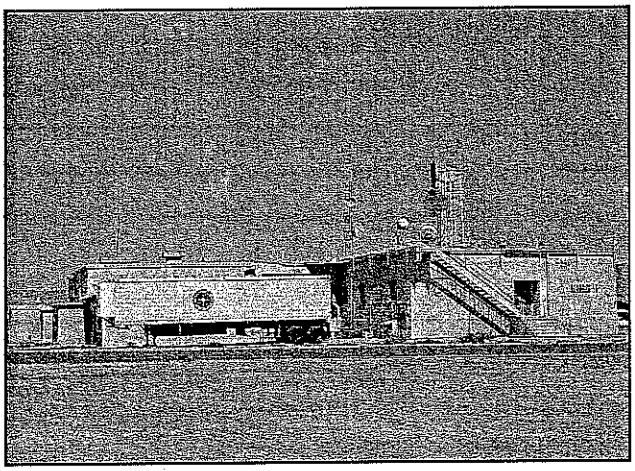
Comments: Essential structural and architectural features remain intact.

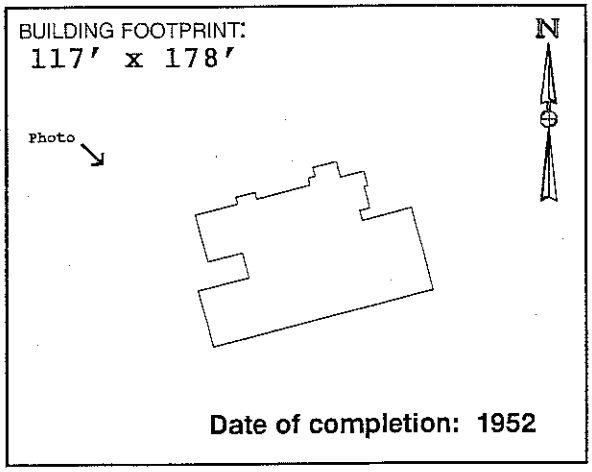
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Recommend listing as part of a Cold War Multiple Property.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1102 is a one-story concrete masonry unit, multi-shaped building with a central corridor running east-west the entire length and single rooms flanking both sides of the corridor. Original footprint shows primarily rectangular shape with a central projecting core. This core is a large open room with an upper balcony around its perimeter. Construction of the original building was completed in 1952, according to "As-built" drawings in CE File #1102-1. Surveillance display room added in 1969 (CE File #1102-1). It is unclear when north elevation additions constructed, although information in Real Property Accountable Record/1102 date the additions as being post-1970. The architect for this project was W. C. Kruger (Santa Fe, NM). The builder is unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1102.

Current Function: Telemetry and Optics. Altitude measurements.

Original Function: Missile Instrumentation Station; Mission Control.

Interim Functions: Missile Radar Station.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1102-1 (c1952).

Foundation: Concrete footing and foundation wall. Column spread footing.

Exterior walls: Concrete masonry units (CMU).

Roof: Bituminous concrete over built-up roof, ltweight concrete, supported by one-way concrete slab using concrete beams and steel beams encased in concrete.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

380

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Eligible under Criteria A and/or C at a national level of significance for important role in early Cold War-era missile and High Speed Test Track mission control and tracking. Further research recommended.

VII. ASSOCIATED BUILDINGS:

Building 1102 supported all missions at White Sands Missile Range and at Holloman Air Force Base until Building 300 and possibly 1527 at White Sands were constructed.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1102 continues to operate as a mission control building, with mostly optics and telemetry functions. The Flight and Instrument Control Room, and the Surveillance Radar rooms are vacant. Originally, missiles were fired using an analog boards (mechanical) system. When operations changed to a digital system in c1978, support moved from the central instrument control room to the north addition off of this room. Nearly all of the original interior finishes remain unchanged.

Suggested routine maintenance: Scrape, prime, and paint all block and concrete surfaces. Remove vegetation and rusted pipes by gas meter. Fill depressions at foundation, and regrade using gravel to promote positive drainage. Fill holes at concrete stoops. Replace wood bumper at dock using similar-sized lumber. Secure panel covers on abandoned electrical panels. Enclose live connections in junction boxes. Scrape, prime, and paint metal stairs. Reattach stair nose treads. Remove miscellaneous debris from building perimeter.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Still situated at the northeast corner of the intersection of Tula Peak Road, and Douglas Road.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The original floor plan remains intact.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Continues to be situated at the intersection of two roads in an isolated setting with few nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Most all original materials have been retained at both the exterior and the interior.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: All original exterior and interior room finishes remain visible. At the south elevation, one window is blocked, one window has been replaced with a door, and the door at the loading dock has been replaced. Most of the north elevation is obscured by the addition of an operations room.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1102 continues to support limited mission control operations.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

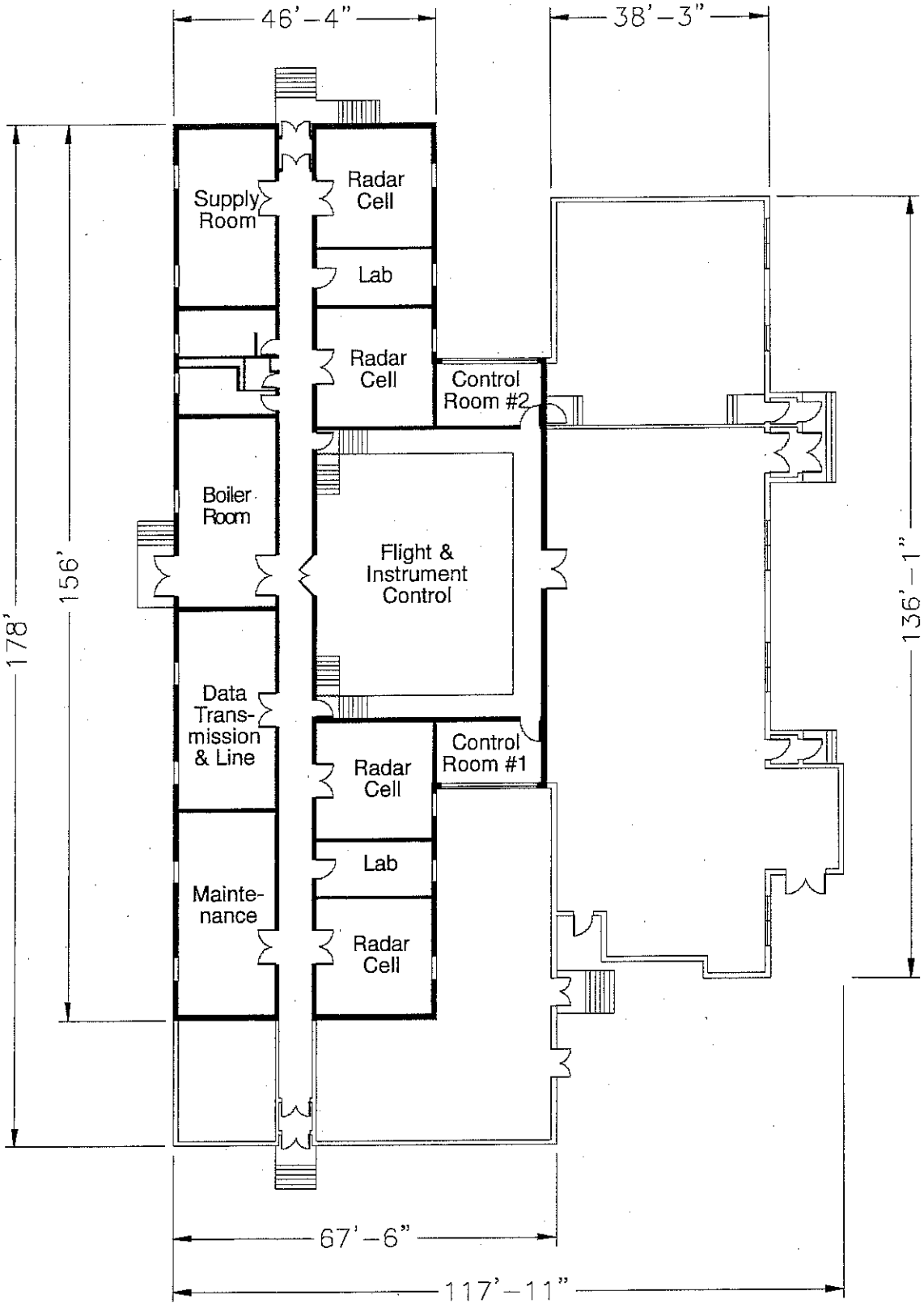
Comments: Building 1102 retains an evident link with its aesthetic and functional historic character.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #49**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1102-1 (c1952)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1102** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-6401* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1103

Specifications and History: See "Cold War Survey" the Layout Plan (Attachment 38) has also been provided.

Attachment 55c shows where the leach field was located for this building in 1984.

Facilities: This building contains the following facilities.

- Tiolets-2
- Urinals-2
- Lavatories-3
- Service Sinks-3

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Timing.
Historic: Telemetering Building.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1103

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance only.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

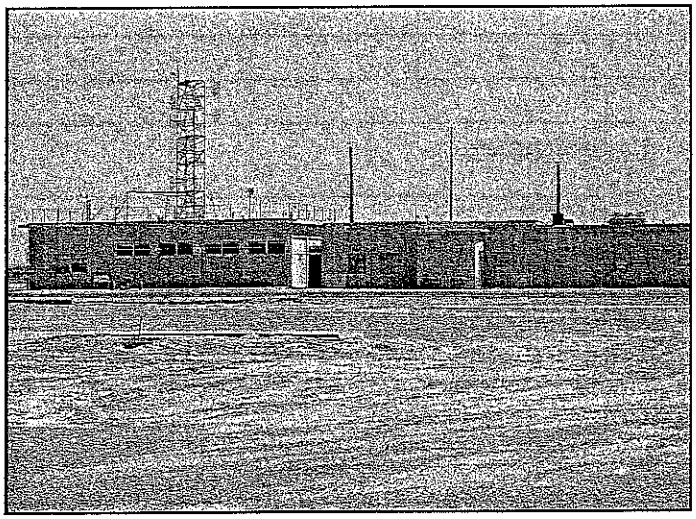
Comments: Few alterations since early improvements.

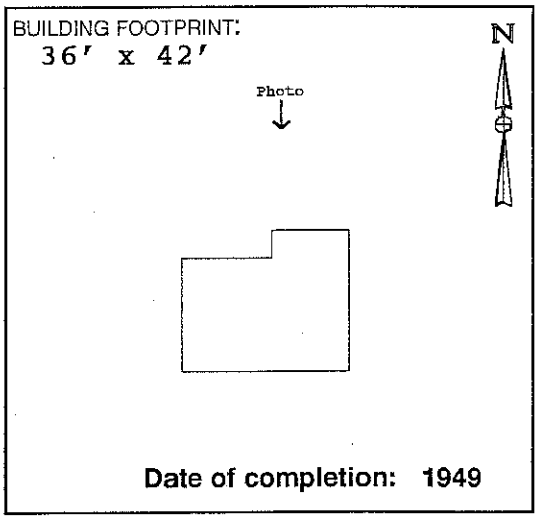
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Research recommended to determine historic use. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1103 is a one-story rectangular building with concrete masonry unit walls, and a flat roof. The original building was completed in 1949, according to "As-built" drawings located in CE File #1103-1. This original construction is centrally located, flanked to the east and west by subsequent additions. Real Property Accountable Record/1103 documents the addition of 2,930 square feet to the original building with the notation "Subsequent Improvements thru May 57." One or both additions to the original building may therefore be considered to be subsequent improvements, rather than additions that compromise historic integrity. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE: (Personal communication with Building 1103 personnel)

Current Function: (East end) Leased by WSMR to transmit mission timings.

Current Function: (West end) Unknown.

Original Function: Telemetering station for data collection of Range missions.

Interim Functions: Real Property Accountable Record/1103: "Communications CTR" (c1962); "Telecom Cen" (c1971); "Comm Fclty" (c1980); "Elec Rsch Rdr" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1103-2 (1967); CE File #1103-1 (1949).

Foundation: Concrete wall footing.

Exterior walls: Painted concrete masonry units (CMU).

Roof: Built-up roof on wood sheathing and 2 x 8 wood joists.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Although perhaps not meeting the "exceptional importance" stipulation imposed on buildings constructed within the last fifty years, Building 1103 may be eligbile for the National Register under Criterion A at a regional or national level in the year 1999. If further research determines that Building 1103 is not eligible as an individual property, consideration should be given to its eligibility as a contributing feature in a Cold War Multiple Property submission for its support of early Cold War-era test launches.

VII. ASSOCIATED BUILDINGS:

Building 1103 was associated during its historic period of significance with Building 1102, mobile data collection vans, and Building 300 at White Sands Missile Range.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1103 appears very different today from depictions on "As-built" drawings dated 1949. It is unclear whether additions to the east and west ends of the original building represent early improvements to the original building, or whether these additions represent later construction that has compromised the historic integrity of the original building. Information obtained from Real Property Record/1103 and field visits seems to indicate that the additions represent early improvements to the original building. If so, Building 1103 retains historic integrity. Further research is needed to verify the construction sequence, and to verify what early Cold War-era research activities were supported by Building 1103. Currently, Building 1103 is leased by the White Sands Missile Range. Aside from minor partitioning at the telemetering room, the original floor plan of the original building shows no alterations. Wood posts (6 x 6) that appear on original drawings to support the roof girders have been removed.

Suggested routine maintenance: Repair, or replace in kind, the exterior wood architectural features, including the soffit, fascia, wood doors, and louvers. Patch spalling concrete at foundation. Remove vegetation at roof.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Original telemetering room is now used as spare equipment storage.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Earlier location plans indicate three utility buildings situated in a row next to Building 1103 to the east. These buildings have been removed. Continues to be set in a somewhat isolated setting, in the vicinity of King-I.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Unable to access some rooms. Those rooms that were accessed, however, appear to have most of the original materials intact. A brick chimney and a metal stack have been removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original windows at north elevation have been covered up at the interior. The telemetering room has been partitioned (reversible).

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity

Comments: Building 1103 personnel are actively engaged in serving as a timing link for White Sands Missile Range tests.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

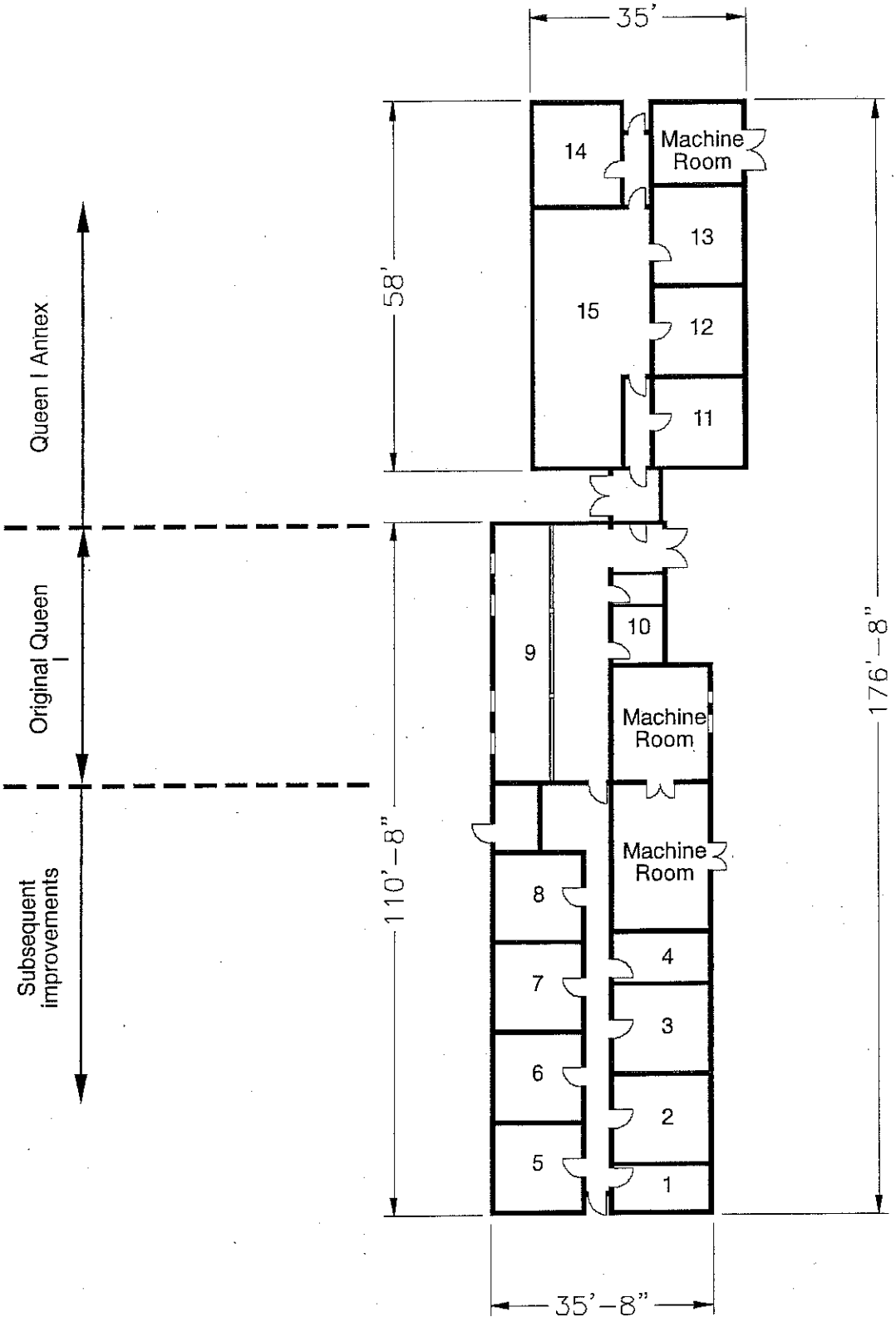
Comments: Building 1103 continues to provide support to the White Sands Missile Range.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #47**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: Dynalectron *Facilities Handbook*, c1964.

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1103** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1108

This building was constructed in 1958 and contains 2626 SF of floor space.
The building was originally built to serve as the telephone exchange. In 1980 it was retitled as a communications facility.
The building contains the following facilities:

- Toilet
- Lavatory
- Janitorial Sink

The drawings provided (Attachment 39-40) show a Utility Plot Plan, Septic Tank Details, Sewer Clean Out, Toilet Room Details and Plan Details.

Attachment 55e shows where the leach field was located for this building in 1984.

Site Specific Contingency Plan: See Attachment 1 and 2

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate into local area on ground

Tank location: North of facility

Fuel Flow - North

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST
MOGAS	250 gal each/ 2 /AST

REMOVED SEPTIC SYSTEMS

BUILDING 1119

This is an Army owned building that contains 2224 SF of floor space. Use and maintenance of the building was transferred to the Air Force in 2005. Prior to the Air Force taking possession the Army had delegated the building to the GSA for use as a vehicle maintenance shop. Once the Air Force took over, the building changed service to an electrical shop and storage facility.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
Diesel	250 gal ea/ 3 /AST
MOGAS	250 gal ea/ 2 /AST
Diesel	750 gal ea/ 3 /AST

Figure 9: Picture of Bldg 1119

REMOVED SEPTIC SYSTEMS

BUILDING 1150

This is also an Army owned building and therefore details are lacking from Holloman's records. The building has 2844 SF.
The original service is unknown, but since the Air Force started using the building it has been used as storage space.
It contains the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 9: Drawing of Bldg 1150

REMOVED SEPTIC SYSTEMS

BUILDING 1154

This is an Army owned building and there is no information in Holloman's files pertaining to this building.

Attachment 55c shows where the leach field was located for this building in 1984.

REMOVED SEPTIC SYSTEMS

BUILDING 1166

This building was constructed in 1960 and contains 4955 SF. The structure is a Test Track Shop/Storage Building known as the "Break Setter Building".
The facilities include:

- Toilets-2
- Urinal
- Lavatory
- Shower

Attachment 41 is a drawing showing the sewer layout and the septic tank details.

Attachment 55c shows where the leach field was located for this building in 1984.

Site Specific Contingency Action: See Attachment 3

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate in local area on ground; if full tank or drum spilled' the substance may reach open ditch.

Material Compatibility: No material incompatibilities

Chemical	Container Type
Oil/Water Separator Waste	500 gal/ 1 / UST

Figure 10: Picture of Bldg. 1166

REMOVED SEPTIC SYSTEMS

BUILDING 1175

Specifications and History: See "Cold War Survey"
Facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

In Attachments 42-44 a trench pit, the toilet room details, the trench junction to UPS, the sanitary sewer manhole and water and sewer piping can be found for Bldg 1175.

Attachment 55c shows where the leach field was located for this building in 1984.

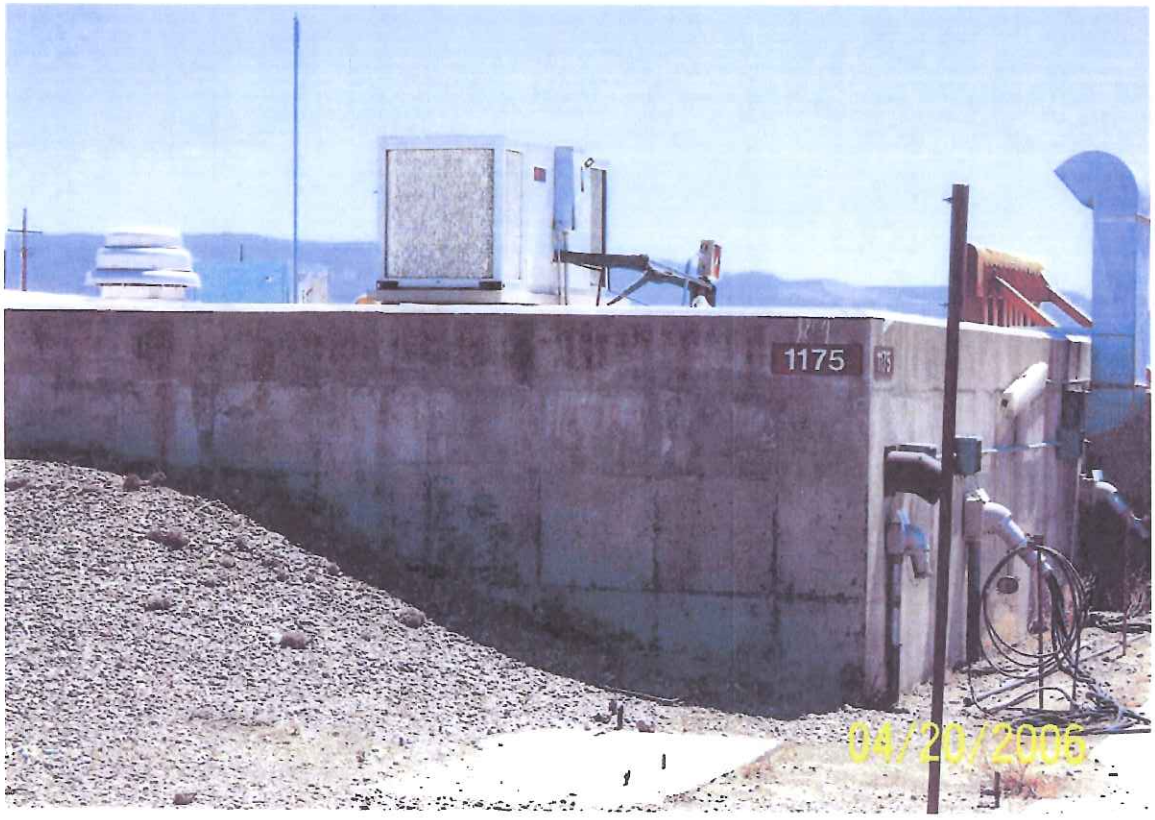


Figure 11: Picture of Bldg 1175

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Blockhouse--"Alpha".
Historic: Blockhouse--"Alpha".
Street Address: 1656 Test Track Rd., HAFB, 88330-7848.

Building Number: 1175

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1175 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

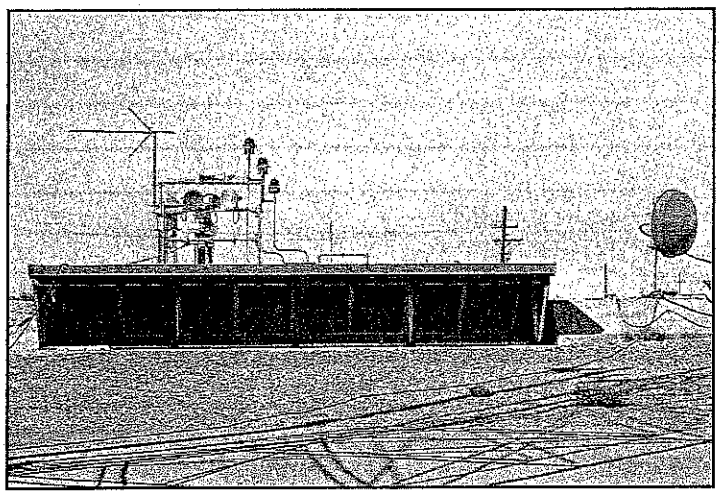
Comments: Modernization at interior to enable continued Test Track use.

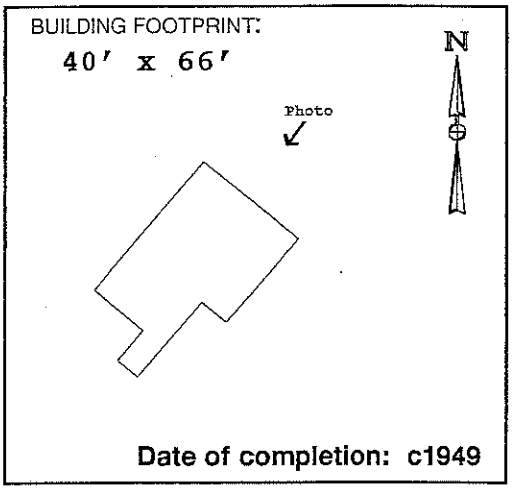
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible for the National Register under Criteria A and/or C.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1175 is an irregularly shaped, one-story concrete structure, built mostly below grade. The building is accessed by a ramp leading down to double doors at the southwest elevation. These doors access the original launch control room constructed in c1949. This entrance, three entrances off of the ramp, and windows facing the track (northeast) are the only visible openings. A 15′ x 32′-6″ addition was constructed at the northwest elevation in 1960 (CE File #1175-2). Another addition, adjacent to northwest side of ramp was completed in 1981 (CE File #1175-3). The ramp extension was also constructed at this time. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1175; CE File #1175-1 (c1949).

Current Function: Launch control facility, High Speed Test Track.

Original Function: Launch control facility, High Speed Test Track.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1175-1 (c1949); CE File #1175 (c1980).

Foundation: Concrete footings.

Exterior walls: Reinforced concrete.

Roof: 3-foot thick reinforced concrete.

Notable interior features, including machinery:
A long row of thick blast-proof windows faces the track to the northeast.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

366

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

"Alpha" Block house Building 1175 is one of the original High Speed Test Track support facilities, constructed c1949 to provide launch control. Recommend that Building 1175 be nominated under Criteria A and C as part of a basewide early Cold War Multiple Property listing.

VII. ASSOCIATED BUILDINGS:

Building 1175 operated, and continues to operate, in support of the high speed test track launching activities, along with Buildings 1162, 1163, 1161, 1645, and the Horizontal Test Stand facility (Buildings 1159 and 1160).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1175 retains historic integrity. Due to its national level of significance under Criteria A and C, recommend that Building 1175 be listed along with the other test track support buildings as part of a Multiple Property nomination to the National Register of Historic Places.

Subsequent improvements to the original Building 1175 augmented the original design and function as a launch control facility for important research conducted at the high speed test track. The interior was renovated in 1984 (CE File #1175-4). Although this renovation obscures original interior finishes, Building 1175 as a whole retains historic integrity of location, design, setting, workmanship, materials, feeling, and association. Of interest to future researchers may be the dramatic changes in computer technology which have occurred since the construction of Alpha Blockhouse: Computers which at that time required several rooms to house, now occupy considerably less space. Launch control operations continue at Alpha Blockhouse, although rooms designed to hold early equipment are virtually empty.

Suggested routine maintenance: Repair bond beam where steel is exposed. Remove vegetation at exterior embankments. Remove debris at front walkway.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Subsequent improvements to the original floor plan added to Building 1175's design and function as a launch control facility.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Except for the construction of smaller buildings in the vicinity, the original setting of Building 1175 near the test track launch pad has been retained.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: The raised wood floor in the console room has been removed. The original light fixtures have been removed. One wood and glass partition has been removed. Sheetrock® walls, carpeting, wainscot, and linoleum have been added to the control room.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original workmanship at the northeast elevation, and at the entrances at the ramp is still visible. Interior renovations hide the original architectural craftsmanship.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1175 continues to function as a launch control facility for the High Speed Test Track.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

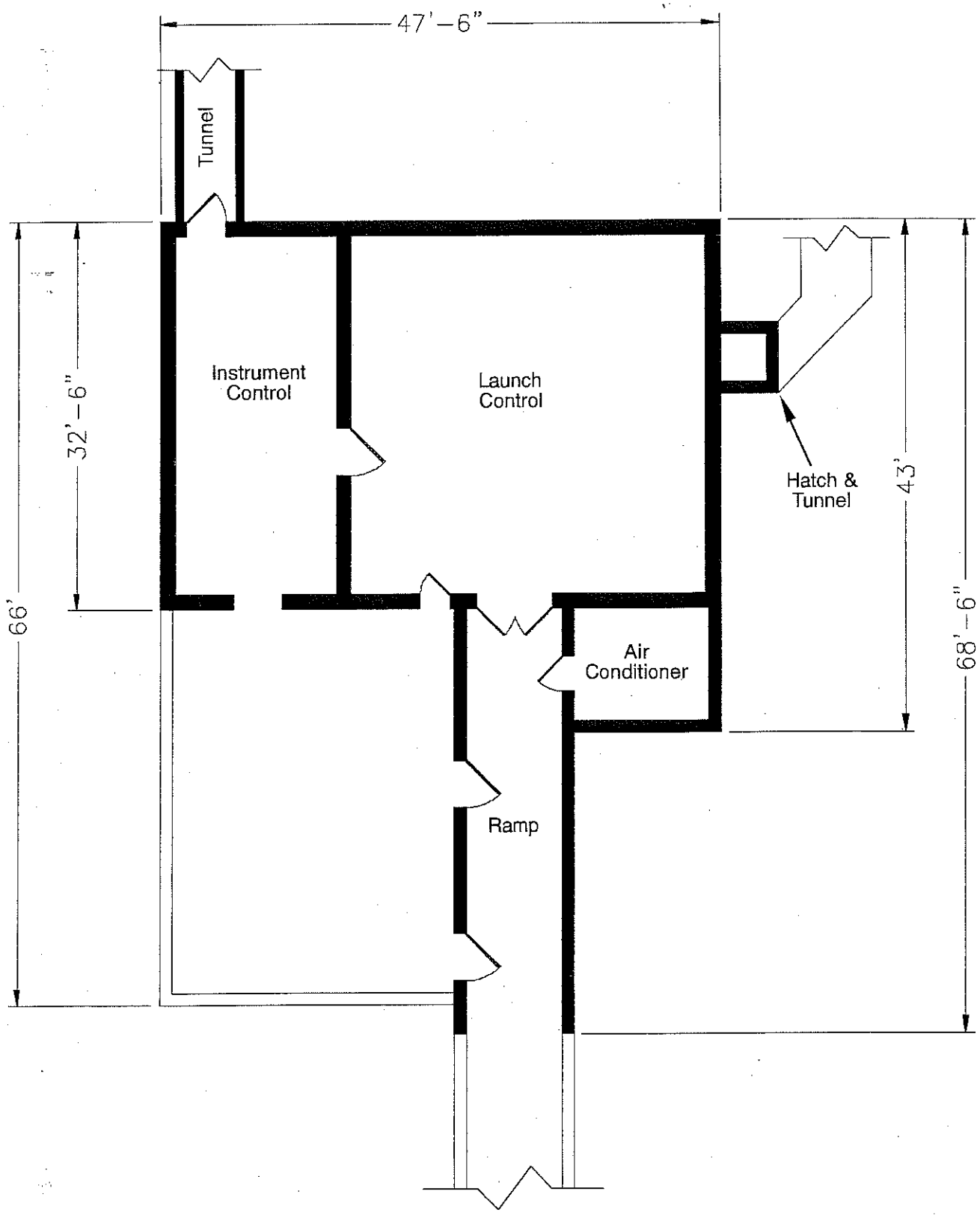
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #35**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1175 (c1980)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1175** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1176

This building was constructed in 1959 and contains 3850 SF.
The building is located at the Test Track and is known as the Sled Launch Shop.
Facilities include:

- Toilet
- Lavatory
- Shower

In Attachments 45-48 a plumbing plan, new drain pit, utility plan, sewer clean out, utilities contour plan and septic tank details can be found for Bldg 1176.

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 12: Picture of Bldg 1176

REMOVED SEPTIC SYSTEMS

BUILDING 1173

This building was constructed in 1957 and contains 17,428 SF.
The building is the main office building at the Test Track.
It contains the following facilities:

- Toilets-8
- Urinals-4
- Lavatories-9
- Janitorial Sinks-2

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 13: Picture of Bldg 1173

REMOVED SEPTIC SYSTEMS

BUILDING 1265

This building was constructed in 1957 and covers 43,388 SF.
This is the Inertial Guidance Facility, previously known as the Guided Weapons Lab.
The building contains the following facilities:

- Toilets-12
- Urinals-6
- Lavatories-12
- Janitorial Sinks-5

This building has been attached to the sewer system at Holloman AFB since before 1984.

In Attachments 49-53 a Water Piping Diagram, Partial Plumbing Plan, Floor Plan, Building, Pavement and Utilities Layout, Sewer Clean Out, and Enlarged Plan can be found for Bldg 1265.

North Wind

Letter No. NW-2008-155

Mr. Dave Griffin
Project Manager
49 CES/CEV
550 Tabosa Ave.
Holloman AFB, NM 88330-8458

11 March 2008

SUBJECT: Technical Memorandum summarizing the decommissioning of inactive septic tanks at HAFB in January of 2008

Dear Mr. Griffin:

Reference Contract Number: W9128F-04-D-0017 DO-0017

Attached please find a copy of the above referenced Technical Memorandum and attached State of New Mexico On-Site Liquid Waste System Abandonment forms. Also attached are copies of the daily reports for the field work.

Please contact me (phone 785-838-3141 or email at tmatzen@northwind-inc.com) or the Program Manager, Rusty Gilbert (phone 210-722-4074 or email at rgilbert@northwind-inc.com) if you have any questions.

Sincerely,

Thomas A. Matzen, P.G.
Project Manager
North Wind, Inc.

Attachments: Technical Memorandum summarizing decommissioning work conducted on inactive septic tanks at HAFB

cc: R. Gilbert (North Wind)
Mr. Tom Zink (USACE Omaha District)
Letter File

North Wind

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
9	1194	01/09/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
10	1196	01/08/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
11	1199	01/09/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
12	1200	01/11/08	No septic tank located. Did locate abandoned earthen pit with a concrete cover. Notified Base POC of situation and received instructions to backfill and abandon.	Removed concrete cover over pit and backfilled pit with clean fill.
13	1201	01/11/08	No septic tank located. Did locate an old abandoned treatment plant. Notified Base POC of situation and received instructions to decommission and backfill the old treatment plant.	Demolished old treatment plant by crushing bottom and caving in sides, then backfilled with clean soil.
14	1219	01/18/08	Septic tank still in use	Notified Base POC that system is still in use
15	1221	01/18/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
16	1226	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.
17	1235	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.
18	1239	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
ON-SITE LIQUID WASTE SYSTEM ABANDONMENT

NMED Permit No.: N/A

System Owner's Name: USACE

Address: HAFB BUILDING #1200

BUILDING SEWER:

_____ Connected to Sewer Lines or Plugged/Capped based on UPC Requirements

ON-SITE LIQUID WASTE SYSTEM TYPE:

- [✓] Septic Tank
- [ ] Seepage Pit
- [ ] Sec./Tert. Treatment Unit
- [ ] Other:
- [ ] Holding Tank
- [ ] Cesspool

ABANDONMENT PROCEDURE:

- ✓ System Pumped
- ✓ Bottom of System Opened or Ruptured or Unit Collapsed
- ✓ System filled with Earth, Sand, Gravel, Concrete, or Other Approved Material
- ✓ Top Cover Removed or Collapsed
- ✓ System Filled to the Top of Sidewalls or above the Level of any Outlet Pipe
- ✓ System Filled Level with Top of Ground Surface

COMMENTS/VIOLATIONS:

Elevation 4122 FT GPS: N 32.87207
W 106.08841

ABANDONMENT PERFORMED BY:

Company Name: Jontel Septic Co

Address: PO Box 937 Zuzuz NM 88337

NMED ACTION TAKEN:

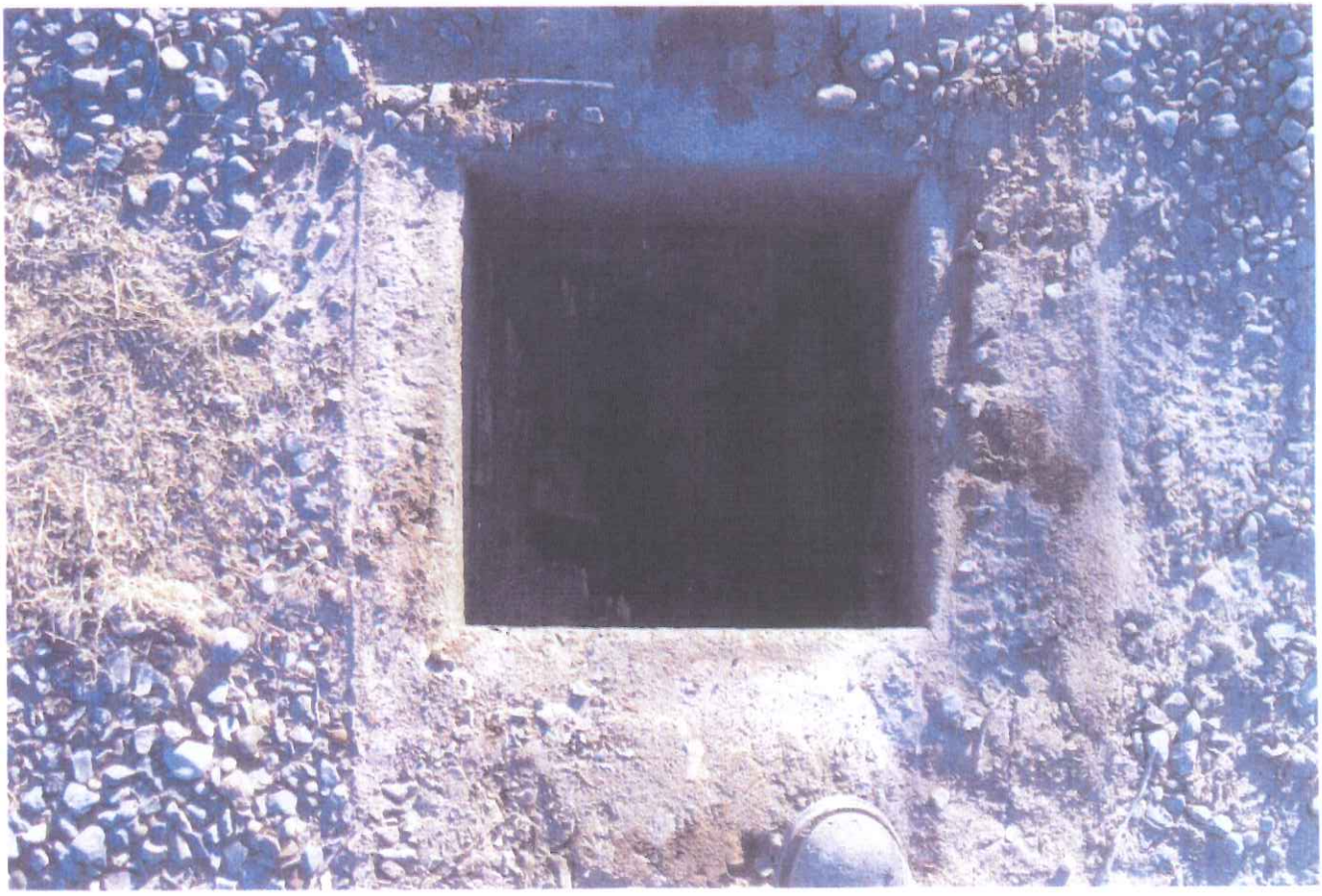
- [ ] Abandonment **Approved**
- [ ] Abandonment **Approved w/conditions** (See Comments/Violations)
- [ ] Abandonment **Not Approved** (See Comments/Violations)

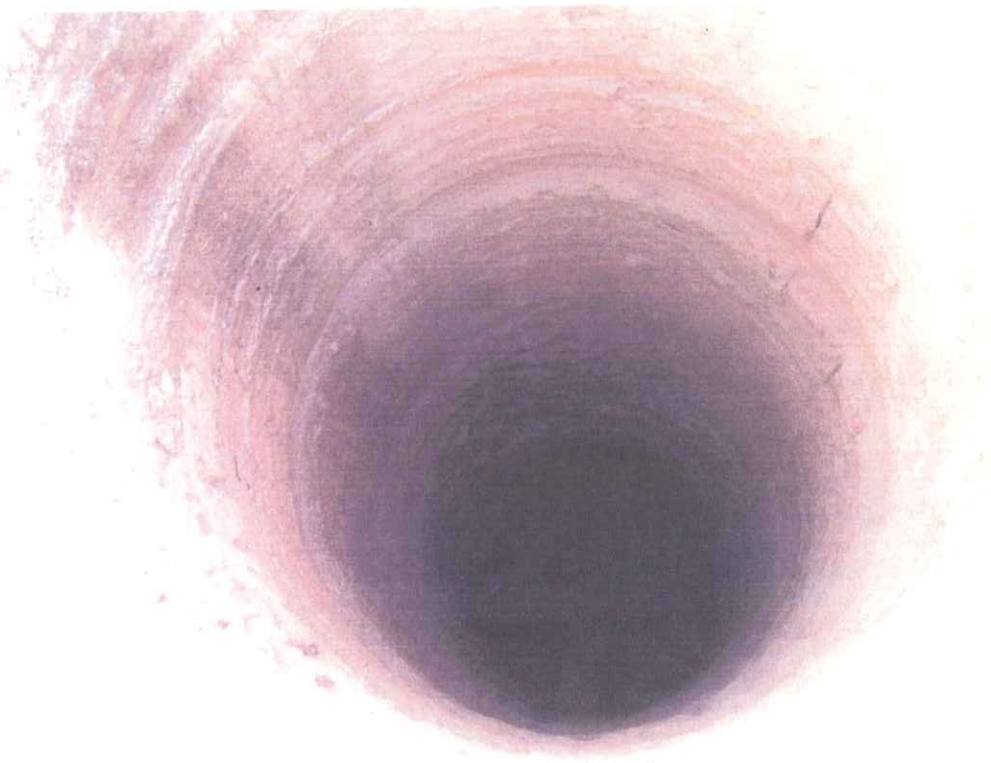
FINAL APPROVAL:

- [ ] Granted
- [ ] Not Granted

NMED Inspector Date

OK - If Abandoned and meets Requirements	N/C - Not Compliant
N/I - Not Inspected	N/V - Not Verified
N/A - Not Applicable	





#1200

1200

Appendix B
Photographic Log

Appendix B
Photographic Log
Building 1200 (OT-C537)

Photo No.	Task and Description
1	Septic Tank/Earthen Pit location – Building 1200
2	Septic Tank/Earthen Pit Proximity to Fence Line – Building 1200
3	Locating Influent Line – Building 1200
4	Locating Influent Line – Building 1200

PHOTO 1: Septic Tank/Earthen Pit location – Building 1200

PHOTO 2: Septic Tank/Earthen Pit Proximity to Fence Line – Building 1200

PHOTO 3: Locating Influent Line – Building 1200

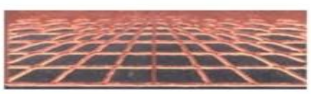
PHOTO 4: Locating Influent Line – Building 1200

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-074

Appendix C
Geophysical Report

ULS SERVICES CORPORATION

GEOMARKOUT LOCATING Co a tradename



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1 (800) 528 – 8206 www.geomarkout.com 1 (866) 804 – 5734

---------- *A Veteran Owned Small Business* ----------

5 July 2012

Christopher Long, P.G.
Scientist
Federal Services
Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, TX 77077

Subject: Field Documentation Report for Geophysical Services -
Location of Utilities and Underground Features Associated
With Former UST and Septic System Sites,
Holloman AFB, NEW MEXICO (SHAW PO 783916-000 OP)

Gentlemen:

This report documents the recent Geophysical Survey field work ULS Services Corp completed at the subject site On and between the dates of 11 June 2012 thru 23 June 2012.

SHAW / ULS SERVICES CORP
GEOPHYSCIAL SERVICES
FORMER UST AND SEPTIC SYSTEM SITES
5 JULY 2012

SCOPE OF WORK

Scope of this work is includes geophysical services at approximately 29 Former UST or Septic Systems sites located across Holloman AFB that have reportedly undergone past abandonment in place or excavation activities. Geophysical services are employed in an attempt to locate potential USTs, former UST excavation areas, abandoned septic tanks or excavations and associated leach field areas. Location of underground utilities near these observed features is included. Observations are marked out in field and electronically mapped with GPS data collection and GIS presentation. Survey of each site is approximately 25 by 25 to 100 by 100 feet in size.

METHODS

Methods utilized in performance of this work include: Visual Inspection, Analog Real - Time Electromagnetic Induction Conductivity Detection (EMICD), Magnetic Locating (MGL), Ground Penetrating Radar (GPR), and EM Pipe and Cable Location (EMPCL). A sub-meter WAAS GPS receiver with automatic real -time differential correction and ESRI Arcpad software is utilized to collect observation data. ESRI Arc View 10 GIS software is utilized for mapping presentation.

EMIMD ground induction methods are employed to detect both 1) broad metal mass anomalies (Rectangular Surface Projections) or conductive zones that may be indicative of potential USTs – Septic tanks, conductive metal debris, steel reinforced concrete, UST's, building hosts, piping, building demo materials, drums, sumps or other unknown burial materials; and 2) to detect relative lateral changes in conductive zones of soil or backfill materials relative to native soils. Former UST excavations and septic -leachate material may potentially have a higher conductive response or well drained leachate fill materials associated with septic systems may in some cases exhibit a relatively lower or quiet conductive response relative to surrounding higher conductive soil response. A two-way Cartesian grid pattern of five by five feet is walked within the search area (site). Observations are real time and marked on ground surface with paint and pin flagging. Observations are collected with a sub- meter GPS with automatic differential correction and plotted approximately onto web based imagery.

GPR is utilized to detect and potentially observe former UST excavation sidewalls as well as septic – leach field pit sidewall and fill areas. GPR is also utilized to compliment the EM Pipe and Cable utility survey work by potentially locating conductive as well as non-conductive utilities.

A EM Pipe and Cable Survey is conducted at each site by performing ambient passive live power and communication line sweeps, active ground induction sweeps, and active direct- connect or induction- clamp sweeps using existing conducts or pipes visibly nearby. Multiple active frequencies are utilized for best Detection. Utilities are identified where possible and marked unknown if not identified.

All observations are marked with hi-visibility orange-red marking paint. Some Ares are hi-lighted with black paint due to light soil conditions. GPR boundaries indicating potential septic tank and leach field areas are outlined with black paint. Pin flags are also utilized to mark these boundaries in soft soil and weed areas.

OBSERVATIONS

Site Description

The Project Site (Holloman AFB - Former UST and Septic Systems) is comprised of approximately 29 different environmental site locations (heir in referred to as Sites) . Each sites includes and varies in description from existing active building locations to in-active remote abandoned to former building areas where USTs or Septic systems were utilized in the past. Each Site is fairly flat with sandy to gravelly surface conditions. Some sites include native brush and weeds. Sites near active building areas include asphalt or concrete surfaces, sidewalks and planter areas. ULS field staff helped review historical documentation available of each site in the field. Where available, drawings and photographs were reviewed. When available, reported GPS coordinates from reports, of septic tank locations, were utilized by SHAW field staff to navigate to septic tank location to aid focus search area.

Generally there are no surface indications of USTS or Septic tanks, however some limited features exist at some sites and include potential vent riser pipes and asphalt patching, settling areas, and conidial – rectangular cracks in concrete. Surface indications of septic systems at some sites include potential inactive clean- outs pipes near building and nearby existing upgraded sewer man-hole systems that have been connected to the existing Base sewer collection system. Some septic system sites have open holes , surface erosion, and associated potential underground voids observed near the inactive cleanouts and suspected septic search area.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

General ambient or background EM conditions at this site are categorized as being high or noisy most likely resulting from caliche or saline soil conditions throughout the area. These conditions all result in a high ambient background EMICD response that are difficult to filter out, however, subtle to distinct lateral changes are observed potentially marking position of former UST excavations. Magnetic locator is not affected by saline conditions. GPR response in these conditions is poor to somewhat fair, however, subtle, trends in GPR observations exhibit dipping or high angle (from horizontal) refraction bands indicating potential soil side-wall trends allowing for location of approximate former excavations. The use of EMICD and GPR data in conjunction with historical information and physical observations are all utilized to mark the approximate location of potential former USTs in the field as shown on the GIS imagery maps.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

Similar response is observed near former septic systems. Most all septic tanks are reported to have been abandoned in place or partly crushed in place. Magnetic locator surveys revealed concentrated areas of metal response (metal anomalies) likely from metal plates and rebar in septic tanks in areas near former sewer clean-outs and next to reported septic tank locations where latitude and longitude data is available. EM Induction and GPR transects over these metal anomalies further corroborated these findings. EM Induction survey results near the effluent (down gradient) side of metal anomalies (potential septic tanks) resulted in observation of relatively moderately higher lateral response to zones of low to quiet lateral response zones near the septic tanks relative to the ambient response in surrounding area. GPR data across these zones exhibited very subtle side-wall trends that appear to corroborate with EMICD findings. The use of EMICD and GPR data in conjunction with historical information and physical observations of cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs in the field and as shown on the GIS imagery maps.

CONCLUSIONS and LIMITATIONS

The use of EMICD and GPR data in conjunction with historical information and physical observations of reported building location, vent riser location, boiler room location, existing and abandoned sewer cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs , Septic tanks and leach fields. Ambient soil conductivity at this site is very high and EM and GPR data observed is very subtle. Field trends are used to mark the approximate location of potential targets.

As in any type of survey or investigation to determine characteristics below grade, careful exploratory excavation or drilling may be needed to further help determine a more accurate determination of the subsurface. Use of hand tools and air knifing is also useful to help as a safety measure. Base one- call utilities, as well as, private 811 one –call should be consulted and recalled as necessary.

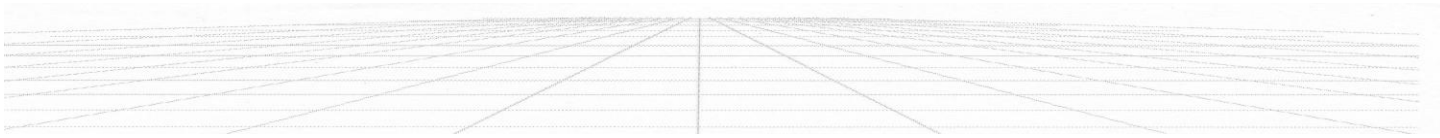
If you have any questions regarding this report please contact me at (206) 384- 2857.

Sincerely,

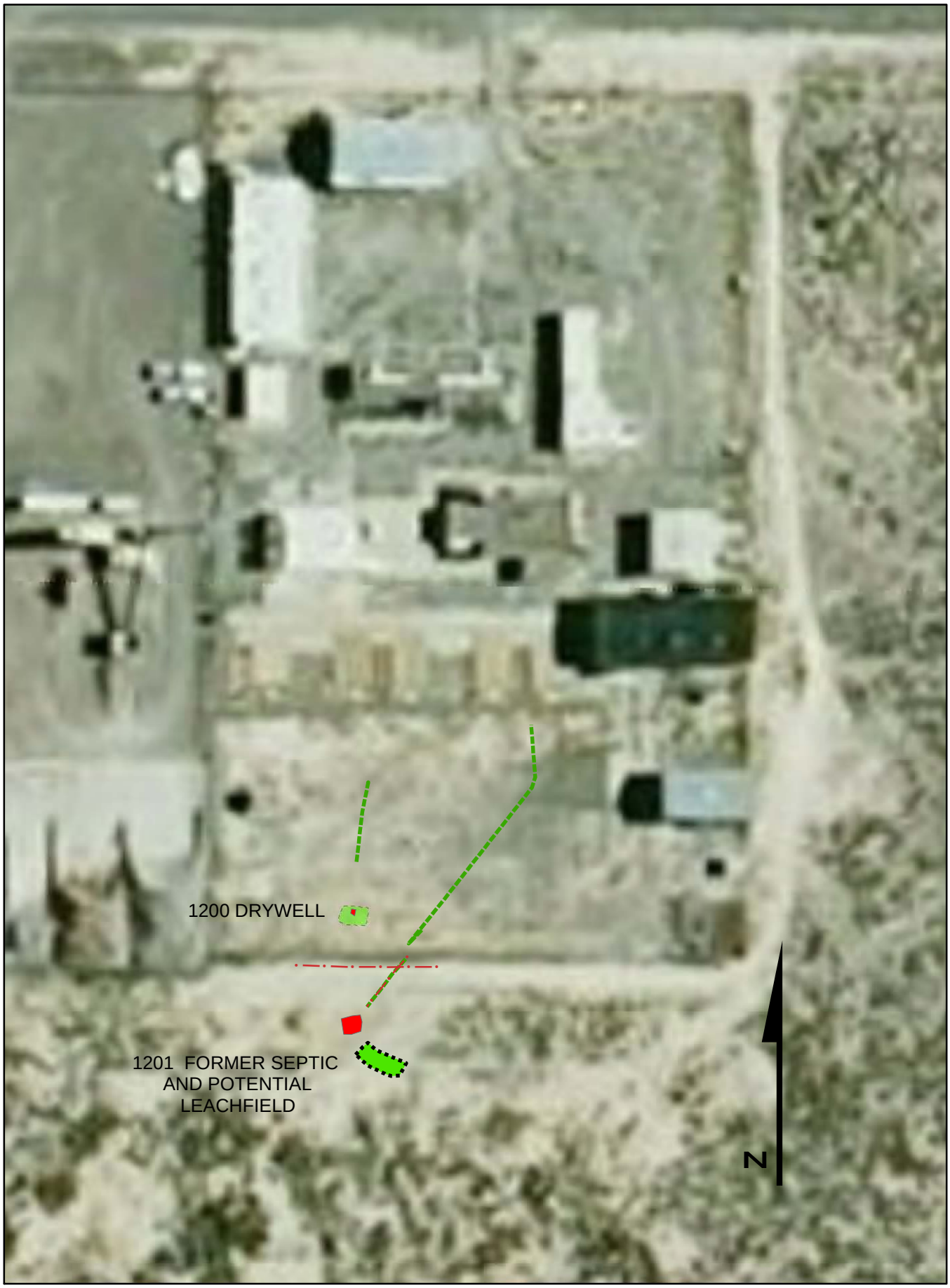
ULS SERVICES CORPORATION
Geomarkout tradename

Michael W. Benedict
Site Representative

Admin Office/Billing: PO Box 724 Pocatello, Idaho 83204
(208) 234-1441 Fax (208) 234-1507 1 800 301-4420
Seattle / Portland / SAC / Alaska / HWI – AS - GUAM Operations
1 - (866) 804- 5734 / San Diego – LA / Operations 1 - (800) 528-8206



BLDG 1200 AND 1201 SEPTIC SYSTEMS
HOLLOMAN AFB



WGS_1984_UTM_Zone_13N
ULS SERVICES CORP
mwb 16 June 2012

0 25 50 100 150 200
Feet

Appendix D
Sample Collection Logs

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager Christopher Long

* STATION 1

Location Code OTC537 (Bldg 1200)

RFA / COC Number 144106 - H016

Sample Number OTC537-IS-0001-~~MMDDYY~~ 071612

Task

Sample Name OTC537-z-OTC537-IS-0001-MMDDYY-z

Collection Date 071612

Sampling Method ~~Unknown~~ Hand Auger

Sample Type ~~Unknown~~ Grab

Collection Time 1325

Sample Purpose ~~Unknown~~ Invest.

Start Depth 3'

QC Code NORMAL ENVIRONMENTAL SAMPL E

End Depth 5'

Sampling Equip Hand Auger

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chas HM 07/10/12

Reviewed By / Dat

Sample Collection Log

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- Holloman AFB

*STATION 1

Manager **Christopher Long**

Location Code **OTC537** (Bldg 1200) *RFA / COC Number* 144106 - Holl6

Sample Number **OTC537-IS-0002-~~MMDDYY~~** 071612 *Task*

Sample Name **OTC537-z-OTC537-IS-0002-MMDDYY-z** *Collection Date* 071612

Sampling Method ~~Unknown~~ DPT *Sample Type* ~~Unknown~~ Grab *Collection Time* 1335

Sample Purpose ~~Unknown~~ Invest. *Start Depth* 10'

QC Code **NORMAL ENVIRONMENTAL SAMPL** *End Depth* 12'

Sampling Equip Geoprobe *Sample Matrix* **SOIL**

QC Partners:

(TB) *(EB)* *(FB)* *SampleTeam* CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	l(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Hill 07/16/12 *Reviewed By / Dat*

Sample Collection Log

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- Holloman AFB

Manager Christopher Long

* STATION 2

Location Code OTC537 (Bldg 1200)

RFA / COC Number 144106 - H016

Sample Number OTC537-IS-0003-~~MMDDYY~~ 071612

Task

Sample Name OTC537-z-OTC537-IS-0003-MMDDYY-z

Collection Date 071612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~

Collection Time 1400

Sample Purpose ~~Unknown~~

Start Depth 7'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 9'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	)(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase Hill 07/16/12

Reviewed By / Dat

Sample Collection Log

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- Holloman AFB

Manager **Christopher Long**

* STATION 2

Location Code **FIELDQC**

RFA / COC Number 144106 - H016

Sample Number **OTC537-IS-0003-~~MMDDYY~~-MS** 071612

Task

Sample Name **FIELDQC-z-OTC537-IS-0003-MMDDYY-MS-z**

Collection Date 07/16/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1400

Sample Purpose ~~Unknown~~ Field QC

Start Depth 7'

QC Code **LAB MATRIX SPIKE**

End Depth 9'

Sampling Equip Geoprobe

Sample Matrix **SOIL**

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	)(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase Hirt 07/16/12

Reviewed By / Dat

Sample Collection Log

Shaw Solutions

- Holloman AFB

Manager Christopher Long

* STATION B 2

Location Code FIELDQC

RFA / COC Number 144106 - H016

Sample Number OTC537-IS-0003-~~MMDDYY~~ 071612 -MSD

Task

Sample Name FIELDQC-z-OTC537-IS-0003-MMDDYY-MSD-z

Collection Date 071612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1460

Sample Purpose ~~Unknown~~ Field QC

Start Depth 7'

QC Code LAB MATRIX SPIKE DUPLICATE

End Depth 9'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	l(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase Hill 07/16/12

Reviewed By / Dat

Sample Collection Log

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- Holloman AFB

Manager Christopher Long

*STATION 2

Location Code OTC537 (Bldg 1200)

RFA / COC Number 144106-H016

Sample Number OTC537-IS-0004-~~MMDDYY~~ 071612

Task

Sample Name OTC537-z-OTC537-IS-0004-MMDDYY-z

Collection Date 071612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1405

Sample Purpose ~~Unknown~~ Invest.

Start Depth 14'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 16'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chris Hill 07/16/12 Reviewed By / Dat

Sample Collection Log

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- Holloman AFB

Manager Christopher Long

* STATION 3

Location Code OTC537 (Bldg 1200)

RFA / COC Number 144106 - H016

Sample Number OTC537-IS-0005-~~MMDDYY~~ 071612

Task

Sample Name OTC537-z-OTC537-IS-0005-MMDDYY-z

Collection Date 071612

Sampling Method ~~Unknown~~ Hand Auger

Sample Type ~~Unknown~~ Grab

Collection Time 1425

Sample Purpose ~~Unknown~~ Invest.

Start Depth 3'

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Hand Auger

Sample Matrix SOIL

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase Hill 07/16/12

Reviewed By / Dat _____

Sample Collection Log

Shaw a CB&I Solutions

- Holloman AFB

Manager Christopher Long

* STATION 3

Location Code OTC537 (Bldg 1200)

RFA / COC Number 144106-H016

Sample Number OTC537-IS-0006-~~MMDDYY~~ 071612

Task

Sample Name OTC537-z-OTC537-IS-0006-MMDDYY-z

Collection Date 071612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1435

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 12

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase Hill 07/16/12

Reviewed By / Dat _____

Sample Collection Log

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- Holloman AFB

Manager Christopher Long

* STATION 3

Location Code FIELDQC

RFA / COC Number 144106 - HOLO

Sample Number OTC537-IS-0007-~~MMDDYY~~071612-FD

Task

Sample Name FIELDQC-z-OTC537-IS-0007-MMDDYY-FD-z

Collection Date 071612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1435

Sample Purpose ~~Unknown~~ Field QC

Start Depth 10'

End Depth 12'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

EXIS Shaw

Logged By / Dat Chad Hill 07/10/12

Reviewed By / Dat

Sample Collection Log

Page: ~~19 of 49~~ 1/1

Shaw Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code ~~FIELDQC~~ IDW

RFA / COC Number HO 38

Sample Number ~~OTC644-GW-0441-MMDDYY-FD~~ LDY-IDWD1-090412

Sample Name ~~FIELDQC-2-OTC644-GW-0441-MMDDYY-FD-z~~

Task

Collection Date 09/04/2012

Sampling Method ~~Unknown~~ Composite

Sample Type ~~Unknown~~ Soil

Collection Time 1330

Sample Purpose ~~Unknown~~ IDW characterization

Start Depth NA

QC Code ~~FIELD DUPLICATE~~ NA

End Depth NA

Sampling Equip Stainless steel Trowel/Bowl/Aluminum

Sample Matrix ~~GROUND WATER~~ IDW Soil

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam LaThom, Hodu

Containers:

	Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
1)	VOCs by SW8260C TCLP VOCs	A	Unknown	~~3~~ 1	~~40~~ 8oz	~~ML~~	~~40 ml VOA Vials~~ Glass	~~HCL~~ Cool to 4°C
	~~SW8015B : GRO~~	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
2)	SVOCs by SW8270D TCLP SVOCs / other organics	EB	Unknown	~~2~~ 1	8	x oz	~~1 Liter Amber Glass~~ Glass	Cool to 4°
	~~SW8015B : GRO~~	B	Unknown	0	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~SW8015B : DRO~~	B	Unknown	2	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~PCBs by SW8082A~~ ~~TCLP~~	E	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
	~~Explosives by SW8330A~~	F	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
3)	~~Tritium by 906.0 Mod~~ RCI	C	Unknown	~~2~~ 1	~~1~~ 8oz		~~1 Liter Amber Glass~~ Glass	~~Cool to 4°C~~ Cool to 4°C
4)	Mercury by SW7470A TCLP Mercury	~~F~~ D	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~ oz	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
5)	Metals by SW6020A TCLP Metals	~~H~~ E	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
	~~Metals by SW6010C~~	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
	~~Total CN water by 335.4~~	I	Unknown	1	500	ML	~~500 ml Poly Container~~	NaOH
	~~TDS by 160.1~~	J	Unknown	1	500	ML	500 ml Poly Container	~~Cool to 4°~~

Comments: Composite Soil sample for TCLP analyses of IDW cuttings rolloff at Lay down Yard, 09/04/12

Sketch Location: Rolloff box Composite Sample @ Lay down Yard.

Analyses: TCLP VOCs, TCLP SVOCs, TCLP metals, TCLP Mercury, RCI

LDY = Lay down Yard

~~Shaw~~ *Logged By / Dat* Mel Hall *Reviewed By / Dat* _____

Sample Collection Log

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- Holloman AFB

Manager **Christopher Long**

Location Code BULK WATER TANK

RFA / COC Number 144106 H070

Sample Number HAFB-IDW-BULK WATER-0001-111612

Task 144106.JM20000

Sample Name HAFB-IDW-BULK WATER-0001-111612

Collection Date 11/16/12

Sampling Method BAILER

Sample Type GRAB

Collection Time 13:00

Sample Purpose CONFIRM IDW

Start Depth N/A

QC Code

End Depth N/A

Sampling Equip DISPOSABLE BAILER

Sample Matrix **WATER**

QC Partners:

(TB) (EB) (FB)

SampleTeam JH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	B	Unknown	4	8	8OZ	Amber Glass	Cool to 4°
SW8015 : ORO	C	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015 : DRO	C	Unknown	1	1	L	1 Liter Amber Glass	H2SO4
Metals by SW6020A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
METALS by SW6020A	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Mercury by SW7470A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Metals by SW6010C	D	Unknown	1	500	ML	500 ml Poly Container	HNO3
	E		1	500	ML	500 ml Poly Cont	Cool to 4°
SW8015 : GRO	F	Unknown	3	40	ML	40 ml VOA Vials	HCL

Comments: SAMPLE COLLECTED FROM BULK WATER STORAGE TANK AFTER ALL WATER DRUMS WERE CONSOLIDATED. SENT BOTH A PRESERVED AND UNPRESERVED 500ML POLY FOR METALS. SPOKE WITH LAB AND THEY SAID TO SEND UNPRESERVED, BUT I THINK MAYBE THEY MADE A MISTAKE.

Sketch Location:

Shaw Logged By / Dat

Reviewed By / Dat

Appendix E
Boring Logs

Boring ID: OT-C537-Station 1

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1200

Date Completed: 7/16/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Ground Elevation AMSL (ft):4110.11
Y Coordinate: 681051.3567
X Coordinate: 1690021.7731

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); white; dry; loose; clayey. Note: hard caliche nodules.		Hand auger from 0 - 5 ft. Began drilling on 7/16/12.
					Same as above (0 ft); tan.	ML	
5		OTC537-IS-0001-071612	NR		Same as above (0 ft).		
					Silty SAND (SM); tan; dry; loose; very fine sand.		
10						SM	
		OTC537-IS-0002-071612	NR		Same as above (7 ft).		
					Clayey SAND (SC); reddish brown; dry; soft; very fine sand.		
15			NR			SC	Total depth = 15 ft. Reached total depth on 7/16/12.
							**Water table not encountered in this boring.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:48 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C537-Station 2

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1200

Date Completed: 7/16/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Ground Elevation AMSL (ft):4109.96
Y Coordinate: 681032.8191
X Coordinate: 1690016.0497

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); white; dry; loose; clayey. Note: very hard at 2 ft.	ML	Hand auger from 0 - 5 ft. Began drilling on 7/16/12.
5			NR		Same as above (0 ft).		
		OTC537-IS-0003-071612			Silty SAND (SM); tan to light brown; dry; loose; very fine sand; trace clay.	SM	
10			NR		Same as above (7 ft).		
		OTC537-IS-0004-071612			Clayey SAND (SC); reddish brown; dry; low plasticity; silty.	SC	
15			NR		Same as above (12 ft).		
20			NR				Total depth = 20 ft. Reached total depth on 7/16/12. **Water table not encountered at this location.
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:48 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C537-Station 3

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1200

Date Completed: 7/16/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: M. Hardner

Ground Elevation AMSL (ft):4110.12
Y Coordinate: 681022.6111
X Coordinate: 1690019.8466

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); tan to light gray; dry; soft; very loose.	ML	Hand auger from 0 - 5 ft. Began drilling on 7/16/12.
5		OTC537-IS-0005-071612	NR		Same as above (0 ft).		
10					Silty SAND (SM); tan; dry; loose; very fine sand; trace clay.	SM	
		OTC537-IS-0006-071612 and OTC537-IS-0007-071612-FD	NR		Same as above (7 ft).		
15			NR		Clayey SAND (SC); reddish brown; dry; low plasticity; silty.	SC	Total depth = 15 ft. Reached total depth on 7/16/12. **Water level not encountered at this location.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:48 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-074

Appendix F
Site Survey Data

Revised Rpt
09/11/2013
(re: TU/US-C513)
p. 7 of 10

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	682987.8550	1687022.9920	4098.16	BASE	682789.9107	1686534.0572
2	678390.1010	1678735.5020	4064.77	CP-52-P-19	678193.4892	1678248.9690
3	683252.1480	1680789.5360	4078.80	CP-55-JACK	683054.1271	1680302.4077
4	681667.1260	1694574.3780	4140.57	CP-56-AIR	681469.5645	1694083.2546
5	669733.4460	1682234.2110	4048.59	HAFB-07-07	669539.3431	1681746.6640
6	669695.2030	1718768.4150	4157.95	ALAMOAIR	669501.1112	1718270.2797
7	674362.7100	1713591.4300	4160.17	F248	674167.2655	1713094.7951
8	676850.6600	1718114.2590	4193.99	E-248	676654.4944	1717616.3133
50	691964.7620	1687201.2770	4140.90	MALONE	691764.2160	1686712.2905
51	662077.1700	1670356.4250	4077.10	BATE	661885.2861	1669872.3205
52	678390.1080	1678735.5040	4066.10	P 19	678193.4962	1678248.9710
53	644127.0780	1700529.8000	4039.00	MONT	643940.3964	1700036.9506
54	676850.6920	1718114.2670	4193.99	E 248	676654.5264	1717616.3213
55	683252.1970	1680789.5390	4080.20	JACK	683054.1761	1680302.4107
56	681667.0380	1694574.3640	4141.20	AIR	681469.4765	1694083.2406
82	678193.4999	1678248.9801	4064.92	P	677996.9451	1677762.5882
84	676654.5300	1717616.3305	4192.77	E	676458.4212	1717118.5291
85	683054.1798	1680302.4198	4079.02	JACK	682856.2163	1679815.4327
86	681469.4802	1694083.2497	4140.00	AIR	681271.9760	1693592.2686
100	685975.0760	1686614.9100	4101.87	OT-C534-PVC	685776.2660	1686126.0934
101	685975.4260	1686614.8310	4102.28	OT-C534-CASING	685776.6159	1686126.0145
102	685952.4860	1686626.9650	4101.89	OT-C534-W2-PVC	685753.6825	1686138.1449
103	685952.6870	1686626.9300	4102.33	OT-C534-W2-CASING	685753.8834	1686138.1099
104	685939.9110	1686581.7340	4101.89	OT-C534-W1-CASING	685741.1111	1686092.9270
105	685939.6450	1686581.7790	4101.57	OT-C534-W1-PVC	685740.8452	1686092.9720
106	685924.3640	1686619.9800	4101.81	OT-C534-W4-PVC	685725.5687	1686131.1620
107	685924.6590	1686619.8790	4102.23	OT-C534-W4-CASING	685725.8636	1686131.0610
108	685934.1180	1686578.3320	4101.72	OT-C534-LEACH-NG	685735.3198	1686089.5260
109	685935.7830	1686600.7340	4101.88	OT-C534-LEACH-NG	685736.9843	1686111.9215
110	685938.2680	1686607.0980	4101.88	OT-C534-LEACH-NG	685739.4686	1686118.2837
111	685951.4240	1686604.4600	4101.90	OT-C534-LEACH-NG	685752.6208	1686115.6465
112	685953.8200	1686601.1380	4101.88	OT-C534-LEACH-NG	685755.0161	1686112.3254
113	685953.2500	1686596.8650	4101.88	OT-C534-LEACH-NG	685754.4463	1686108.0537
114	685946.2830	1686578.3790	4101.81	OT-C534-LEACH-NG	685747.4813	1686089.5730
115	685945.3070	1686576.3400	4101.88	OT-C534-LEACH-NG	685746.5056	1686087.5346
116	685940.6850	1686575.6580	4101.79	OT-C534-LEACH-NG	685741.8849	1686086.8528
117	685952.3510	1686614.8200	4102.03	OT-C534-LEACH-NG	685753.5475	1686126.0035
118	685953.0040	1686623.0300	4102.13	OT-C534-LEACH-NG	685754.2004	1686134.2111
119	685945.6920	1686623.1960	4102.03	OT-C534-LEACH-NG	685746.8905	1686134.3770
120	685944.8810	1686615.5440	4101.97	OT-C534-LEACH-NG	685746.0797	1686126.7272
121	685948.0570	1686615.1700	4101.97	OT-C534-FLINE-NG	685749.2548	1686126.3534
122	685947.7680	1686606.3420	4101.81	OT-C534-FLINE-NG	685748.9659	1686117.5279
123	685953.2050	1686618.0690	4102.08	OT-C534-ENFLU-NG	685754.4013	1686129.2515
124	685968.5800	1686611.5870	4102.06	OT-C534-ENFLU-NG	685769.7718	1686122.7714
125	686021.5760	1686604.3860	4102.49	OT-C534-ENFLU-NG	685822.7525	1686115.5725
126	686051.0660	1686600.5520	4102.82	OT-C534-ENFLU-NG	685852.2339	1686111.7396
127	682943.9250	1686529.5770	4094.74	OT-C536-STATION1-NG	682745.9934	1686040.7852
128	682925.1900	1686534.9010	4094.63	OT-C536-STATION2-NG	682727.2639	1686046.1076
129	682914.0740	1686530.8350	4094.17	OT-C536-STATION3-NG	682716.1511	1686042.0428
130	682900.2750	1686534.1950	4094.40	MW-OT-C5361-CASING	682702.3561	1686045.4018
131	682900.0410	1686534.2560	4094.03	MW-OT-C5361-PVC	682702.1222	1686045.4628
132	682892.0960	1686514.3610	4094.08	OT-C536-LEACH-NG	682694.1795	1686025.5736
133	682905.9860	1686504.4840	4093.98	OT-C536-LEACH-NG	682708.0654	1686015.6994
134	682914.9460	1686505.2970	4094.10	OT-C536-LEACH-NG	682717.0228	1686016.5122
135	682919.4610	1686521.1490	4094.40	OT-C536-LEACH-NG	682721.5365	1686032.3596
136	682921.1340	1686534.7310	4094.42	OT-C536-LEACH-NG	682723.2091	1686045.9377
137	682919.5910	1686545.0230	4094.72	OT-C536-LEACH-NG	682721.6665	1686056.2267
138	682912.1700	1686551.2270	4094.60	OT-C536-LEACH-NG	682714.2477	1686062.4289
139	682897.7180	1686551.9240	4094.16	OT-C536-LEACH-NG	682699.7998	1686063.1257
140	682892.5110	1686549.8820	4094.18	OT-C536-LEACH-NG	682694.5943	1686061.0843
141	682922.3680	1686533.4440	4094.42	OT-C536-TANKPIT-NG	682724.4427	1686044.6510
142	682920.9800	1686525.5880	4094.39	OT-C536-TANKPIT-NG	682723.0551	1686036.7973
143	682928.0220	1686524.4280	4094.63	OT-C536-TANKPIT-NG	682730.0951	1686035.6377
144	682929.2370	1686532.7090	4094.62	OT-C536-TANKPIT-NG	682731.3097	1686043.9163
145	682949.7020	1686528.9800	4094.75	OT-C536-ENFLU-NG	682751.7688	1686040.1883
146	682921.2900	1686528.9090	4094.41	OT-C536-ENFLU-NG	682723.3650	1686040.1174
147	682916.2970	1686530.1310	4094.27	OT-C536-ENFLU-NG	682718.3735	1686041.3390
148	682877.6850	1686739.3620	4095.03	OT-C533-MW-CASING	682679.7726	1686250.5094
149	682877.4490	1686739.4350	4094.68	OT-C533-MW-PVC	682679.5367	1686250.5823
150	682884.2550	1686735.8390	4094.76	OT-C533-LEACH-NG	682686.3407	1686246.9874
151	682877.4700	1686734.1690	4094.84	OT-C533-LEACH-NG	682679.5577	1686245.3179

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
152	682871.6400	1686736.6530	4094.83	OT-C533-LEACH-NG	682673.7294	1686247.8011
153	682869.4200	1686738.9370	4094.89	OT-C533-LEACH-NG	682671.5100	1686250.0845
154	682868.8760	1686741.4810	4094.99	OT-C533-LEACH-NG	682670.9662	1686252.6277
155	682867.8710	1686756.1100	4095.03	OT-C533-LEACH-NG	682669.9615	1686267.2525
156	682857.6950	1686766.0680	4095.35	OT-C533-LEACH-NG	682659.7884	1686277.2076
157	682855.8760	1686772.9280	4095.39	OT-C533-LEACH-NG	682657.9700	1686284.0656
158	682855.6590	1686783.4130	4095.46	OT-C533-LEACH-NG	682657.7530	1686294.5476
159	682855.5230	1686790.0690	4095.47	OT-C533-LEACH-NG	682657.6171	1686301.2017
160	682857.2270	1686794.8730	4095.42	OT-C533-LEACH-NG	682659.3206	1686306.0043
161	682858.6900	1686813.7880	4095.55	OT-C533-LEACH-NG	682660.7832	1686324.9138
162	682867.9360	1686816.7350	4095.32	OT-C533-LEACH-NG	682670.0265	1686327.8599
163	682880.0660	1686814.6740	4095.00	OT-C533-LEACH-NG	682682.1530	1686325.7995
164	682891.9700	1686818.7840	4094.82	OT-C533-LEACH-NG	682694.0535	1686329.9083
165	682901.1340	1686806.7570	4094.86	OT-C533-LEACH-NG	682703.2148	1686317.8848
166	682889.7110	1686785.0140	4094.98	OT-C533-LEACH-NG	682691.7952	1686296.1481
167	682889.3190	1686757.8750	4094.96	OT-C533-LEACH-NG	682691.4033	1686269.0170
168	682886.6550	1686745.7080	4094.83	OT-C533-LEACH-NG	682688.7400	1686256.8535
169	682895.8900	1686814.7130	4095.19	OT-C533-FFLUEN-NG	682697.9724	1686325.8385
170	682901.8890	1686814.2530	4095.86	OT-C533-FFLUEN-TPAD	682703.9696	1686325.3787
171	682901.5970	1686811.8220	4095.84	OT-C533-SEPTIC-TCONC	682703.6777	1686322.9484
172	682911.5820	1686810.3750	4095.77	OT-C533-SEPTIC-TCONC	682713.6598	1686321.5018
173	682912.4280	1686815.4170	4095.77	OT-C533-SEPTIC-TCONC	682714.5056	1686326.5423
174	682902.3730	1686816.8390	4095.84	OT-C533-SEPTIC-TCONC	682704.4535	1686327.9639
175	682912.0910	1686812.7560	4095.77	OT-C533-EFLUEN-TCONC	682714.1687	1686323.8821
176	682923.3600	1686810.9450	4095.29	OT-C533-EFLUEN-NG	682725.4344	1686322.0716
177	682942.2940	1686810.3140	4095.49	OT-C533-EFLUEN-NG	682744.3629	1686321.4408
178	682937.5080	1686805.9000	4095.30	OT-C533-STATION1-NG	682739.5783	1686318.0278
179	682906.2780	1686808.8380	4094.86	OT-C533-STATION2-NG	682708.3574	1686319.9652
180	682895.2770	1686813.2080	4094.98	OT-C533-STATION3-NG	682697.3595	1686324.3340
181	700191.9570	1695605.3730	4181.72	OT-C540-STATION1-ASP	699989.0266	1695113.9508
182	700173.9260	1695611.2520	4181.82	OT-C540-STATION2-NG	699971.0008	1695119.8281
183	700168.8930	1695604.5390	4181.39	OT-C540-STATION3-NG	699965.9693	1695113.1170
184	700151.2700	1695598.6630	4180.49	OT-C540-STATION4-NG	699948.3514	1695107.2427
185	700158.9630	1695593.9090	4180.86	OT-C540-LEACH-NG	699956.0422	1695102.4901
186	700150.2560	1695603.0840	4180.78	OT-C540-LEACH-NG	699947.3377	1695111.6625
187	700152.8330	1695609.6400	4180.81	OT-C540-LEACH-NG	699949.9139	1695118.2166
188	700155.1660	1695611.7200	4180.89	OT-C540-LEACH-NG	699952.2463	1695120.2960
189	700161.1020	1695611.3470	4181.11	OT-C540-LEACH-NG	699958.1805	1695119.9231
190	700163.7200	1695601.1600	4181.06	OT-C540-LEACH-NG	699960.7978	1695109.7390
191	700161.5790	1695596.1920	4181.05	OT-C540-LEACH-NG	699958.6574	1695104.7725
192	700165.7400	1695603.7570	4181.48	OT-C540-FFLUEN-NG	699962.8172	1695112.3353
193	700170.8520	1695608.8530	4181.93	OT-C540-FFLUEN-NG	699967.9277	1695117.4298
194	700170.7290	1695606.7600	4182.01	OT-C540-SEPTIC-NG	699967.8048	1695115.3374
195	700176.8760	1695605.4490	4181.91	OT-C540-SEPTIC-NG	699973.9500	1695114.0268
196	700177.5910	1695612.4300	4181.92	OT-C540-SEPTIC-NG	699974.6648	1695121.0058
197	700172.1930	1695613.9030	4182.05	OT-C540-SEPTIC-NG	699969.2683	1695122.4783
198	700177.7030	1695608.9790	4181.69	OT-C540-EFLUEN-NG	699974.7767	1695117.5558
199	700205.8220	1695608.1850	4181.85	OT-C540-EFLUEN-ASPH	700002.8876	1695116.7620
200	700246.4300	1695613.4690	4182.95	OT-C540-EFLUEN-ASPH	700043.4838	1695122.0445
201	700238.4930	1695614.0360	4182.51	OT-C540-BLDGCOR	700035.5491	1695122.6113
202	700228.4390	1695608.1640	4182.55	OT-C540-BLDGCOR	700025.4980	1695116.7410
203	700227.0510	1695568.0300	4182.87	OT-C540-BLDGCOR	700024.1104	1695076.6186
204	700236.9380	1695557.6950	4183.02	OT-C540-BLDGCOR	700033.9946	1695066.2866
205	688305.7410	1690609.5510	4126.46	TU\US-C507-STATION1-	688106.2555	1690119.5767
206	688309.7220	1690614.0760	4126.51	TU\US-C507-STATION2-	688110.2353	1690124.1004
207	688306.7130	1690619.4150	4126.45	TU\US-C507-STATION3-	688107.2272	1690129.4378
208	688313.7000	1690621.8280	4126.37	TU\US-C507-STATION4-	688114.2122	1690131.8501
209	688313.7950	1690607.6410	4126.36	TU\US-C507-STATION5-	688114.3071	1690117.6673
210	688304.0140	1690620.9730	4126.47	TU\US-C507-USTPIT-AS	688104.5290	1690130.9954
211	688304.3040	1690607.3010	4126.54	TU\US-C507-USTPIT-AS	688104.8189	1690117.3274
212	688317.4320	1690607.1780	4126.54	TU\US-C507-USTPIT-AS	688117.9431	1690117.2044
213	688317.6000	1690622.2860	4126.57	TU\US-C507-USTPIT-AS	688118.1110	1690132.3080
214	688320.7590	1690623.9670	4127.18	TU\US-C507-BLDGCOR	688121.2691	1690133.9885
215	688330.7630	1690627.7570	4125.65	TU\US-C507-BLDGCOR	688131.2702	1690137.7774
216	688318.5520	1690598.7120	4126.71	TU\US-C507-BLDGCOR	688119.0628	1690108.7408
217	688306.5580	1690598.9520	4126.69	TU\US-C507-BLDGCOR	688107.0722	1690108.9808
218	688287.5740	1690592.3200	4126.83	TU\US-C507-EXMW1	688088.0937	1690102.3507
219	688287.4600	1690625.9270	4126.36	TU\US-C507-EXMW2	688087.9798	1690135.9480
220	689216.8690	1680453.8850	4087.76	TU\US-C501-STATION4-	689017.1194	1679966.8540
221	689203.4000	1680450.4300	4087.80	TU\US-C501-STATION1-	689003.6543	1679963.4000
222	689227.9170	1680449.2880	4087.78	TU\US-C501-STATION2-	689028.1642	1679962.2584

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
223	689201.2820	1680437.6020	4087.96	TU\US-C501-STATION3-	689001.5369	1679950.5757
224	689204.0090	1680426.7550	4087.80	TU\US-C501-STATION5-	689004.2631	1679939.7319
225	689200.5240	1680440.6650	4087.95	TU\US-C501-BLDGCOR-N	689000.7792	1679953.6379
226	689191.1430	1680432.8740	4088.07	TU\US-C501-BLDGCOR-N	688991.4009	1679945.8491
227	689202.0960	1680449.8730	4087.79	TU\US-C501-TANKPIT-N	689002.3507	1679962.8432
228	689201.5860	1680440.8210	4087.99	TU\US-C501-TANKPIT-N	689001.8408	1679953.7938
229	689191.7450	1680432.9310	4088.07	TU\US-C501-TANKPIT-N	688992.0027	1679945.9061
230	689195.4710	1680423.1750	4087.88	TU\US-C501-TANKPIT-N	688995.7276	1679936.1529
231	689207.1960	1680422.4490	4087.92	TU\US-C501-TANKPIT-N	689007.4492	1679935.4271
232	689229.2900	1680431.3210	4087.77	TU\US-C501-TANKPIT-N	689029.5368	1679944.2966
233	689231.6150	1680444.1310	4087.67	TU\US-C501-TANKPIT-N	689031.8611	1679957.1029
234	689227.5450	1680454.7320	4087.83	TU\US-C501-TANKPIT-N	689027.7923	1679967.7008
235	689218.0540	1680463.3780	4088.03	TU\US-C501-TANKPIT-N	689018.3041	1679976.3443
236	689209.0460	1680458.6260	4087.92	TU\US-C501-TANKPIT-N	689009.2987	1679971.5937
237	689237.1630	1680445.1670	4087.64	TU\US-C501-COMMLINE-	689037.4075	1679958.1386
238	689219.6050	1680436.9770	4088.00	TU\US-C501-COMMLINE-	689019.8546	1679949.9509
239	689199.7540	1680431.6770	4088.06	TU\US-C501-COMMLINE-	689000.0094	1679944.6525
240	689181.3550	1680425.0490	4088.20	TU\US-C501-COMMLINE-	688981.6157	1679938.0264
241	689162.6180	1680417.3900	4088.35	TU\US-C501-COMMLINE-	688962.8841	1679930.3696
242	689161.5970	1680417.5650	4088.56	TU\US-C501-COMMVAULT	688961.8634	1679930.5446
243	689157.8580	1680421.3400	4088.11	TU\US-C501-COMMVAULT	688958.1255	1679934.3185
244	689150.8680	1680414.5760	4088.10	TU\US-C501-COMMVAULT	688951.1375	1679927.5564
245	689154.6050	1680410.8830	4088.46	TU\US-C501-COMMVAULT	688954.8735	1679923.8645
246	687246.6430	1686873.0010	4105.82	OT-C535-STATION1-NG	687047.4644	1686384.1096
247	687270.5400	1686861.6690	4105.63	OT-C535-STATION2-NG	687071.3545	1686372.7809
248	687282.8340	1686866.7860	4105.85	OT-C535-STATION3-NG	687083.6449	1686377.8964
249	687303.5940	1686788.5490	4105.12	OT-C535-STATION4-NG	687104.3989	1686299.6821
250	687291.9640	1686793.7970	4105.27	OT-C535-LEACH-NG	687092.7723	1686304.9286
251	687304.7930	1686782.8770	4105.17	OT-C535-LEACH-NG	687105.5976	1686294.0117
252	687323.6740	1686798.1880	4105.34	OT-C535-LEACH-NG	687124.4731	1686309.3183
253	687319.7080	1686817.5380	4105.82	OT-C535-LEACH-NG	687120.5083	1686328.6627
254	687307.4400	1686838.9610	4105.76	OT-C535-LEACH-NG	687108.2438	1686350.0795
255	687297.0830	1686856.5380	4106.04	OT-C535-LEACH-NG	687097.8898	1686367.6514
256	687290.0540	1686837.9200	4105.59	OT-C535-LEACH-NG	687090.8628	1686349.0388
257	687291.3760	1686806.0200	4105.33	OT-C535-LEACH-NG	687092.1845	1686317.1480
258	687284.5890	1686864.5150	4106.11	OT-C535-FFLUEN-NG	687085.3994	1686375.6261
259	687276.8290	1686868.4490	4106.19	OT-C535-FFLUEN-NG	687077.6417	1686379.5589
260	687276.0820	1686870.8490	4106.28	OT-C535-SEPTIC-NG	687076.8949	1686381.9583
261	687263.3720	1686869.7190	4105.87	OT-C535-SEPTIC-NG	687064.1886	1686380.8286
262	687263.7200	1686863.5770	4105.95	OT-C535-SEPTIC-NG	687064.5365	1686374.6884
263	687276.4840	1686862.8870	4106.07	OT-C535-SEPTIC-NG	687077.2968	1686373.9986
264	687263.5270	1686868.1150	4105.92	OT-C535-EFLUEN-NG	687064.3435	1686379.2250
265	687228.9570	1686874.1570	4105.71	OT-C535-EFLUEN-NG	687029.7836	1686385.2653
266	687235.2230	1686881.4610	4106.05	OT-C535-BLDGCOR-NG	687036.0477	1686392.5672
267	687225.9150	1686892.3360	4105.90	OT-C535-BLDGCOR-NG	687026.7424	1686403.4390
268	687232.0250	1686844.5370	4105.92	OT-C535-BLDGCOR-NG	687032.8507	1686355.6539
269	687221.4890	1686835.3400	4105.63	OT-C535-BLDGCOR-NG	687022.3177	1686346.4595
270	677637.2460	1692755.6660	4110.24	TU/US-C505-MW1-CASIN	677440.8524	1692265.0697
271	677636.9990	1692755.6590	4109.84	TU/US-C505-MW1-PVC	677440.6055	1692265.0627
272	677634.4160	1692722.3930	4110.42	TU/US-C505-WELLATEMP	677438.0233	1692231.8064
273	677659.4620	1692742.2400	4110.34	TU/US-C505-WELLATEMP	677463.0620	1692251.6476
274	677701.9500	1692799.3200	4110.17	TU/US-C505-USTPIT-NG	677505.5377	1692308.7111
275	677701.3830	1692789.3010	4110.35	TU/US-C505-USTPIT-NG	677504.9708	1692298.6950
276	677711.5570	1692789.5280	4110.64	TU/US-C505-USTPIT-NG	677515.1419	1692298.9219
277	677710.8940	1692799.1130	4110.24	TU/US-C505-USTPIT-NG	677514.4791	1692308.5041
278	677707.4060	1692790.0820	4110.35	TU/US-C505-STATION1-	677510.9921	1692299.4757
279	677702.3100	1692795.0710	4110.20	TU/US-C505-STATION2-	677505.8976	1692304.4633
280	677705.6610	1692797.9500	4110.13	TU/US-C505-STATION3-	677509.2476	1692307.3415
281	677710.4770	1692793.8740	4110.09	TU/US-C505-STATION4-	677514.0622	1692303.2666
282	677706.4200	1692793.8350	4110.12	TU/US-C505-STATION5-	677510.0064	1692303.2276
283	677694.5060	1692779.7220	4110.88	TU/US-C505-BLDGCOR-N	677498.0958	1692289.1187
284	677704.1940	1692790.4680	4110.28	TU/US-C505-BLDGCOR-N	677507.7810	1692299.8616
285	677754.5670	1692783.0890	4110.79	TU/US-C505-BLDGCOR-N	677558.1394	1692292.4848
286	677743.8570	1692795.1680	4110.70	TU/US-C505-BLDGCOR-N	677547.4325	1692304.5603
287	686300.2320	1672933.0350	4060.98	OT-C542-MW-CASING-	686101.3277	1672448.1837
288	686300.2350	1672933.0550	4060.98	OT-C542-MW-PVC	686101.3307	1672448.2037
289	686274.4020	1672914.6520	4061.01	OT-C542-LEACH-NG	686075.5052	1672429.8061
290	686289.6710	1672938.5250	4060.76	OT-C542-LEACH-NG	686090.7698	1672453.6721
291	686294.6900	1672941.1720	4060.83	OT-C542-LEACH-NG	686095.7873	1672456.3184
292	686301.6970	1672938.9490	4060.85	OT-C542-LEACH-NG	686102.7923	1672454.0960
293	686305.7170	1672936.2850	4060.87	OT-C542-LEACH-NG	686106.8111	1672451.4328

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
294	686308.0670	1672931.0550	4060.89	OT-C542-LEACH-NG	686109.1604	1672446.2043
295	686304.8000	1672917.9090	4060.82	OT-C542-LEACH-NG	686105.8944	1672433.0621
296	686292.3740	1672901.2590	4060.90	OT-C542-LEACH-NG	686093.4720	1672416.4169
297	686283.4190	1672906.7050	4060.97	OT-C542-FFLUEN-NG	686084.5196	1672421.8614
298	686280.3770	1672902.6520	4060.94	OT-C542-FFLUEN-NG	686081.4785	1672417.8095
299	686276.9070	1672904.6420	4060.95	OT-C542-SEPTIC-NG	686078.0095	1672419.7990
300	686271.2980	1672896.9550	4060.80	OT-C542-SEPTIC-NG	686072.4021	1672412.1142
301	686281.9530	1672889.9350	4060.83	OT-C542-SEPTIC-NG	686083.0540	1672405.0962
302	686287.0950	1672896.6800	4060.88	OT-C542-SEPTIC-NG	686088.1945	1672411.8393
303	686285.7900	1672894.7150	4060.83	OT-C542-EFLUEN-NG	686086.8899	1672409.8748
304	686299.2270	1672887.1560	4060.87	OT-C542-EFLUEN-NG	686100.3230	1672402.3180
305	686310.9860	1672881.5880	4061.18	OT-C542-EFLUEN-NG	686112.0786	1672396.7516
306	686294.2970	1672858.0380	4060.90	OT-C542-BLDGCOR-NG	686095.3944	1672373.2085
307	686295.8820	1672844.1310	4061.28	OT-C542-BLDGCOR-NG	686096.9790	1672359.3055
308	686345.1390	1672922.4560	4060.89	OT-C542-BLDGCOR-NG	686146.2217	1672437.6078
309	686358.9780	1672924.0940	4061.42	OT-C542-BLDGCOR-NG	686160.0567	1672439.2453
310	686291.8860	1672885.1500	4060.65	OT-C542-STATION1-NG	686092.9841	1672400.3126
311	686275.2730	1672891.5340	4060.63	OT-C542-STATION2-NG	686076.3760	1672406.6948
312	686281.5390	1672904.6340	4060.73	OT-C542-STATION2-NG	686082.6401	1672419.7910
313	685750.1690	1671530.2910	4055.60	OT-C543-STATION2-NG	685551.4241	1671045.8463
314	685734.0730	1671548.8090	4055.84	OT-C543-STATION2	685535.3328	1671064.3589
315	685727.7350	1671514.3350	4055.33	OT-C543-STATION3	685528.9966	1671029.8949
316	685749.4390	1671546.6740	4055.91	OT-C543-EXSEPTIC	685550.6944	1671062.2245
317	685732.6430	1671545.5190	4055.74	OT-C543-EXSEPTIC	685533.9032	1671061.0699
318	685741.2600	1671557.0720	4056.32	OT-C543-EXSEPTIC	685542.5177	1671072.6195
319	685738.1510	1671537.7290	4055.62	OT-C543-EXSEPTIC	685539.4096	1671053.2821
320	685734.3520	1671541.2760	4055.65	OT-C543-FFLUEN	685535.6117	1671056.8281
321	685716.0920	1671515.5090	4055.04	OT-C543-FFLUEN	685517.3570	1671031.0686
322	685708.2650	1671520.5800	4055.23	OT-C543-LEACH	685509.5323	1671036.1381
323	685688.3040	1671512.0560	4055.52	OT-C543-LEACH	685489.5771	1671027.6166
324	685669.5610	1671502.3840	4055.36	OT-C543-LEACH	685470.8395	1671017.9474
325	685659.9210	1671495.2130	4055.04	OT-C543-LEACH	685461.2023	1671010.7784
326	685670.4020	1671495.5660	4055.43	OT-C543-MW-CASING	685471.6803	1671011.1313
327	685670.1370	1671495.6580	4055.13	OT-C543-MW-PVC	685471.4153	1671011.2233
328	685682.2550	1671485.7460	4055.16	OT-C543-LEACH	685483.5298	1671001.3142
329	685699.8070	1671491.2750	4054.76	OT-C543-LEACH	685501.0767	1671006.8416
330	685710.4840	1671499.0550	4055.06	OT-C543-LEACH	685511.7506	1671014.6193
331	685721.5030	1671508.4730	4055.40	OT-C543-LEACH	685522.7664	1671024.0346
332	685794.8190	1671498.3320	4056.84	OT-C543-EFLUEN	685596.0612	1671013.8965
333	685809.3600	1671495.0820	4059.27	OT-C543-BLDGCOR	685610.5980	1671010.6475
334	685776.9050	1671465.9090	4060.02	OT-C543-BLDGCOR	685578.1524	1670981.4829
335	685785.4230	1671455.8900	4060.26	OT-C543-BLDGCOR	685586.6679	1670971.4668
336	685744.8400	1671542.1950	4055.76	OT-C543-EFLUEN	685546.0967	1671057.7468
337	685303.6520	1671072.3550	4048.79	OT-C544-MW-CASING	685105.0365	1670588.0430
338	685303.3550	1671072.2840	4048.52	OT-C544-MW-PVC	685104.7396	1670587.9720
339	685349.4970	1671083.9730	4052.43	OT-C544-STATION1	685150.8683	1670599.6576
340	685342.4960	1671086.5980	4051.55	OT-C544-STATION1	685143.8693	1670602.2819
341	685336.0530	1671085.0120	4050.99	OT-C544-STATION1	685137.4282	1670600.6963
342	685336.7000	1671089.5480	4051.15	OT-C544-SEPTIC	685138.0750	1670605.2310
343	685338.4520	1671075.7050	4051.30	OT-C544-SEPTIC	685139.8265	1670591.3920
344	685347.8050	1671077.3720	4052.23	OT-C544-SEPTIC	685149.1768	1670593.0585
345	685345.6600	1671089.9410	4052.38	OT-C544-SEPTIC	685147.0324	1670605.6239
346	685356.1020	1671079.9660	4041.22	OT-C544-EFLUEN	685157.4713	1670595.6518
347	685347.2700	1671081.8770	4052.36	OT-C544-EFLUEN	685148.6419	1670597.5622
348	685337.4940	1671082.4320	4051.31	OT-C544-FFLUEN	685138.8687	1670598.1171
349	685335.1290	1671082.2690	4051.14	OT-C544-FFLUEN	685136.5044	1670597.9541
350	685336.2280	1671075.8560	4050.85	OT-C544-LEACH	685137.6031	1670591.5430
351	685323.3310	1671071.0830	4049.91	OT-C544-LEACH	685124.7098	1670586.7714
352	685297.8990	1671068.1360	4048.16	OT-C544-LEACH	685099.2852	1670583.8252
353	685296.9990	1671078.2660	4047.94	OT-C544-LEACH	685098.3855	1670593.9523
354	685317.0900	1671090.9580	4049.62	OT-C544-LEACH	685118.4707	1670606.6406
355	685334.6940	1671090.0750	4050.81	OT-C544-LEACH	685136.0696	1670605.7579
356	685360.4020	1671127.4140	4053.89	OT-C544-BLDGCOR	685161.7701	1670643.0860
357	685349.8450	1671114.5020	4052.32	OT-C544-BLDGCOR	685151.2162	1670630.1778
358	685360.3480	1671033.1240	4052.96	OT-C544-BLDGCOR	685161.7161	1670548.8234
359	685371.1230	1671022.2010	4053.70	OT-C544-BLDGCOR	685172.4880	1670537.9035
360	669828.5970	1693339.1960	4077.44	TU/US-C503-STATION1	669634.4665	1692848.4306
361	669823.8520	1693340.4930	4077.30	TU/US-C503-STATION2	669629.7229	1692849.7272
362	669816.1660	1693331.0930	4077.32	TU/US-C503-STATION3	669622.0391	1692840.3299
363	669804.9830	1693324.1990	4077.14	TU/US-C503-STATION5	669610.8594	1692833.4379
364	669830.2120	1693344.6950	4077.63	TU/US-C503-STATION4	669636.0811	1692853.9280

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
365	669820.3680	1693343.5050	4078.10	TU/US-C503-USTTANK	669626.2399	1692852.7383
366	669826.9160	1693337.2450	4077.78	TU/US-C503-USTTANK	669632.7860	1692846.4802
367	669831.7020	1693342.9300	4077.73	TU/US-C503-USTTANK	669637.5706	1692852.1635
368	669817.5060	1693300.2710	4077.28	TU/US-C503-BLDGCOR	669623.3788	1692809.5169
369	669817.0280	1693314.4610	4077.69	TU/US-C503-BLDGCOR	669622.9009	1692823.7028
370	669870.4630	1693326.6030	4077.24	TU/US-C503-BLDGCOR	669676.3204	1692835.8412
371	669857.6770	1693326.9550	4077.12	TU/US-C503-BLDGCOR	669663.5381	1692836.1931
372	669799.9830	1693280.8270	4076.53	TU/US-C503-BLDGCOR	669605.8608	1692790.0785
373	669786.0040	1693280.0690	4077.00	TU/US-C503-BLDGCOR	669591.8859	1692789.3207
374	669753.1970	1693299.5360	4076.55	TU/US-C503-MW1-CASIN	669559.0884	1692808.7821
375	669753.0160	1693299.6510	4076.22	TU/US-C503-MW1-PVC	669558.9075	1692808.8971
376	669717.9520	1693348.6000	4074.92	TU/US-C503-MW3-PVC	669523.8536	1692857.8319
377	669718.0930	1693348.2730	4075.65	TU/US-C503-MW3-CASIN	669523.9946	1692857.5050
378	669746.8950	1693329.2100	4076.92	TU/US-C503-BLDGCOR	669552.7882	1692838.4475
379	669747.5820	1693308.1150	4076.21	TU/US-C503-BLDGCOR	669553.4750	1692817.3586
380	669906.5180	1693361.1640	4077.43	TU/US-C503-MW2-CASIN	669712.3650	1692870.3922
381	669906.2520	1693361.2650	4077.07	TU/US-C503-MW2-PVC	669712.0990	1692870.4932
382	669887.0390	1693344.8910	4077.53	TU/US-C503-BLDGCOR	669692.8916	1692854.1239
383	669886.0230	1693359.0930	4077.99	TU/US-C503-BLDGCOR	669691.8759	1692868.3218
384	670862.3470	1691695.2520	4072.78	TU/US-C500-MW1-CASIN	670667.9169	1691204.9630
385	670862.1340	1691695.4850	4072.39	TU/US-C500-MW1-PVC	670667.7040	1691205.1960
386	670897.1420	1691671.0590	4072.25	TU/US-C500-MW2-PVC	670702.7019	1691180.7771
387	670897.3420	1691670.8340	4072.66	TU/US-C500-MW2-CASIN	670702.9018	1691180.5521
388	670997.2710	1691721.0890	4072.90	TU/US-C500-MW3-CASIN	670802.8018	1691230.7926
389	670996.9840	1691721.2540	4072.41	TU/US-C500-MW3-PVC	670802.5149	1691230.9575
390	670952.1640	1691699.4910	4072.04	TU/US-C500-STATION1	670757.7079	1691209.2008
391	670948.0960	1691682.1740	4072.36	TU/US-C500-STATION4	670753.6411	1691191.8888
392	670936.4590	1691683.8290	4072.05	TU/US-C500-STATION5	670742.0075	1691193.5434
393	670929.6330	1691690.0950	4072.11	TU/US-C500-STATION2	670735.1834	1691199.8075
394	670923.0530	1691673.0510	4072.18	TU/US-C500-STATION3	670728.6054	1691182.7685
395	670946.5050	1691708.7370	4072.40	TU/US-C500-USTPIT	670752.0506	1691218.4441
396	670961.7540	1691693.8260	4072.62	TU/US-C500-USTPIT	670767.2951	1691203.5375
397	670931.1680	1691662.3970	4072.93	TU/US-C500-USTPIT	670736.7180	1691172.1176
398	670915.4940	1691676.4560	4072.43	TU/US-C500-USTPIT	670721.0485	1691186.1725
399	670921.7940	1691667.6910	4072.61	TU/US-C500-BLDGCOR	670727.3467	1691177.4100
400	670938.3020	1691685.3670	4072.19	TU/US-C500-BLDGCOR	670743.8499	1691195.0809
401	670954.8550	1691686.5260	4072.52	TU/US-C500-BLDGCOR	670760.3981	1691196.2396
402	670964.2580	1691691.8600	4072.50	TU/US-C500-BLDGCOR	670769.7984	1691201.5720
403	670981.1410	1691692.8760	4072.84	TU/US-C500-BLDGCOR	670786.6765	1691202.5877
404	681138.2190	1690535.4430	4109.80	OT-C538-MW1-CASING	680940.8108	1690045.4902
405	681137.9660	1690535.5040	4109.43	OT-C538-MW1-PVC	680940.5579	1690045.5512
406	681154.3000	1690506.8540	4109.64	OT-C538-STATION3	680956.8871	1690016.9095
407	681170.7650	1690504.3700	4110.30	OT-C538-STATION2	680973.3473	1690014.4262
408	681207.7160	1690542.9160	4110.07	OT-C538-STATION1	681010.2876	1690052.9610
409	681171.2020	1690513.1430	4110.35	OT-C538-SEPTIC	680973.7842	1690023.1966
410	681160.8350	1690514.8700	4110.22	OT-C538-SEPTIC	680963.4202	1690024.9231
411	681157.5830	1690502.2430	4109.87	OT-C538-SEPTIC	680960.1692	1690012.2998
412	681168.6240	1690500.8410	4110.30	OT-C538-SEPTIC	680971.2070	1690010.8982
413	681157.7430	1690507.8780	4109.92	OT-C538-FFLUEN	680960.3291	1690017.9332
414	681149.7900	1690513.8560	4109.82	OT-C538-FFLUEN	680952.3784	1690023.9094
415	681146.2870	1690511.1610	4109.76	OT-C538-LEACH	680948.8764	1690021.2152
416	681140.0690	1690516.2140	4109.76	OT-C538-LEACH	680942.6602	1690026.2667
417	681131.8360	1690535.6580	4109.59	OT-C538-LEACH	680934.4296	1690045.7051
418	681142.3480	1690541.6090	4109.45	OT-C538-LEACH	680944.9386	1690051.6544
419	681148.4850	1690524.6340	4109.80	OT-C538-LEACH	680951.0738	1690034.6843
420	681152.9240	1690518.6140	4110.01	OT-C538-LEACH	680955.5115	1690028.6661
421	681171.0630	1690513.0040	4110.32	OT-C538-EFLUEN	680973.6453	1690023.0577
422	681199.3120	1690534.6340	4109.92	OT-C538-EFLUEN	681001.8861	1690044.6814
423	681311.9210	1690619.8910	4111.94	OT-C538-EFLUEN	681114.4624	1690129.9137
424	681378.0600	1690614.8720	4112.52	OT-C538-EFLUEN	681180.5823	1690124.8962
425	681511.9950	1690621.0250	4112.35	OT-C538-EFLUEN-C/O	681314.4785	1690131.0474
426	681543.8210	1690614.3290	4112.13	OT-C538-EFLUEN-C/O	681346.2952	1690124.3533
427	681545.1500	1690624.0320	4110.59	OT-C538-EFLUEN	681347.6238	1690134.0535
428	681526.9290	1690617.7410	4112.19	OT-C538-BLDGCOR	681329.4081	1690127.7643
429	681516.5600	1690627.6780	4112.22	OT-C538-BLDGCOR	681319.0421	1690137.6984
430	681517.0030	1690674.6590	4112.55	OT-C538-BLDGCOR	681319.4850	1690184.6658
431	681526.9640	1690685.0850	4112.68	OT-C538-BLDGCOR	681329.4431	1690195.0888
432	681610.3380	1690617.1910	4112.15	OT-C538-BLDGCOR	681412.7929	1690127.2145
433	681620.0290	1690626.9090	4112.29	OT-C538-BLDGCOR	681422.4811	1690136.9297
434	681248.7970	1690511.7190	4110.11	OT-C537-STATION1	681051.3567	1690021.7731
435	681230.2540	1690505.9940	4109.96	OT-C537-STATION2	681032.8191	1690016.0497

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
436	681220.0430	1690509.7920	4110.12	OT-C537-STATION3	681022.6111	1690019.8466
437	681224.9030	1690501.6020	4109.95	OT-C537-SEPTICDRY	681027.4697	1690011.6590
438	681224.2220	1690518.0560	4110.28	OT-C537-SEPTICDRY	681026.7889	1690028.1082
439	681236.7540	1690518.9910	4110.31	OT-C537-SEPTICDRY	681039.3172	1690029.0429
440	681236.4080	1690501.8520	4110.13	OT-C537-SEPTICDRY	681038.9713	1690011.9089
441	681237.2180	1690508.8330	4110.12	OT-C537-INLINE	681039.7811	1690018.8879
442	681311.7430	1690515.4440	4111.03	OT-C537-INLINE	681114.2845	1690025.4970
443	670561.7210	1680587.5740	4050.10	TU/US-C506-MW2-CASIN	670367.3781	1680100.5043
444	670561.4170	1680587.6760	4049.68	TU/US-C506-MW2-PVC	670367.0742	1680100.6062
445	670504.3430	1680580.0920	4050.14	TU/US-C506-MW1-PVC	670310.0167	1680093.0244
446	670504.5340	1680580.0020	4050.56	TU/US-C506-MW1-CASIN	670310.2076	1680092.9345
447	670508.2600	1680580.6030	4050.26	TU/US-C506-USTTANK	670313.9326	1680093.5353
448	670507.1490	1680575.9500	4050.27	TU/US-C506-USTTANK	670312.8219	1680088.8836
449	670517.9280	1680578.9030	4050.27	TU/US-C506-USTTANK	670323.5978	1680091.8358
450	670517.4300	1680574.2280	4050.28	TU/US-C506-USTTANK	670323.0999	1680087.1621
451	670507.9350	1680578.1630	4050.18	TU/US-C506-STATION1	670313.6077	1680091.0960
452	670513.3690	1680579.8330	4050.20	TU/US-C506-STATION2	670319.0401	1680092.7655
453	670517.9640	1680576.4150	4050.25	TU/US-C506-STATION3	670323.6338	1680089.3485
454	670511.2330	1680575.3810	4050.12	TU/US-C506-STATION4	670316.9047	1680088.3148
455	670512.5770	1680577.6370	4050.16	TU/US-C506-STATION5	670318.2483	1680090.5702
456	670485.1820	1680557.6150	4050.53	TU/US-C506-EXMW1-CAS	670290.8613	1680070.5540
457	670484.8980	1680557.6790	4050.38	TU/US-C506-EXMW1-PVC	670290.5773	1680070.6179
458	670494.8180	1680553.5430	4050.36	TU/US-C506-BLDGCOR	670300.4945	1680066.4831
459	670506.7310	1680561.7710	4050.38	TU/US-C506-BLDGCOR	670312.4040	1680074.7088
460	670510.1770	1680607.5970	4050.36	TU/US-C506-BLDGCOR	670315.8490	1680120.5215
461	670507.2460	1680618.1900	4050.39	TU/US-C506-BLDGCOR	670312.9189	1680131.1114
462	672564.5350	1692766.5990	4084.67	OT-C530-STATION1	672369.6116	1692275.9995
463	672567.1650	1692774.7240	4084.79	OT-C530-STATION2	672372.2409	1692284.1222
464	672567.5210	1692771.2850	4084.93	OT-C530-ACTSEPTIC	672372.5967	1692280.6842
465	672572.0780	1692767.3740	4084.89	OT-C530-ACTSEPTIC	672377.1524	1692276.7743
466	672575.8660	1692771.9070	4084.91	OT-C530-ACTSEPTIC	672380.9393	1692281.3060
467	672571.4280	1692775.8290	4084.95	OT-C530-ACTSEPTIC	672376.5026	1692285.2269
468	672569.6900	1692769.3550	4084.91	OT-C530-INLINE	672374.7651	1692278.7547
469	672563.6000	1692772.1360	4084.83	OT-C530-MW-CASING	672368.6769	1692281.5349
470	672563.2920	1692772.2960	4084.49	OT-C530-MW-PVC	672368.3690	1692281.6949
471	672509.9810	1692700.4750	4085.41	OT-C530-INLINE	672315.0734	1692209.8947
472	672538.3940	1692677.7240	4085.37	OT-C530-BLDGCOR	672343.4782	1692187.1503
473	672538.9710	1692663.8680	4085.27	OT-C530-BLDGCOR	672344.0550	1692173.2983
474	672478.3960	1692731.8290	4085.45	OT-C530-BLDGCOR	672283.4976	1692241.2396
475	672485.2490	1692739.1720	4085.12	OT-C530-BLDGCOR	672290.3486	1692248.5805
476	685978.3640	1686617.0530	4101.95	OT-C534-STATION1	685779.5530	1686128.2358
477	685949.9370	1686623.2970	4101.80	OT-C534-STATION2	685751.1342	1686134.4780
478	686041.6810	1686591.0650	4102.58	OT-C534-BLDGCOR	685842.8517	1686102.2553
479	686050.4200	1686580.6970	4102.78	OT-C534-BLDGCOR	685851.5881	1686091.8903
480	686053.7100	1686616.8100	4102.90	OT-C534-BLDGCOR	685854.8772	1686127.9929
481	686043.1140	1686607.6280	4102.82	OT-C534-BLDGCOR	685844.2842	1686118.8135
482	670482.5190	1680558.2400	4050.60	TU/US-C506-MW3-CASIN	670288.1990	1680071.1788
483	670482.3210	1680558.1750	4050.11	TU/US-C506-MW3-PVC	670288.0011	1680071.1138
484	669451.6250	1685381.2210	4054.88	TU/US-C515-STATION1	669257.6038	1684892.7620
485	669456.5920	1685373.9060	4054.66	TU/US-C515-STATION2	669262.5694	1684885.4491
486	669447.7270	1685364.3830	4054.13	TU/US-C515-STATION3	669253.7069	1684875.9289
487	669442.7430	1685375.3260	4054.34	TU/US-C515-STATION4	669248.7244	1684886.8687
488	669450.0780	1685373.9310	4054.62	TU/US-C515-STATION5	669256.0572	1684885.4741
489	669529.8630	1685390.3120	4053.57	TU/US-C515-MW3-PVC	669335.8191	1684901.8503
490	669530.0710	1685390.1630	4053.84	TU/US-C515-MW3-CASIN	669336.0271	1684901.7014
491	669347.3380	1685357.3580	4053.37	TU/US-C515-MW2-CASIN	669153.3470	1684868.9059
492	669347.0390	1685357.4240	4052.93	TU/US-C515-MW2-PVC	669153.0481	1684868.9719
493	669367.7310	1685396.1250	4053.43	TU/US-C515-MW1-PVC	669173.7341	1684907.6617
494	669368.0180	1685396.0880	4053.86	TU/US-C515-MW1-CASIN	669174.0210	1684907.6247
495	669413.7390	1685386.4140	4054.97	TU/US-C515-BLDGCOR	669219.7288	1684897.9535
496	669405.0760	1685397.5400	4056.39	TU/US-C515-BLDGCOR	669211.0683	1684909.0762
497	669442.6490	1685383.8010	4054.90	TU/US-C515-TANKPIT	669248.6304	1684895.3412
498	669458.4310	1685381.6630	4055.08	TU/US-C515-TANKPIT	669264.4078	1684893.2039
499	669454.7400	1685363.6010	4054.47	TU/US-C515-TANKPIT	669260.7179	1684875.1471
500	669440.8050	1685364.3540	4054.07	TU/US-C515-TANKPIT	669246.7869	1684875.8999
501	669474.3460	1685377.9770	4054.82	TU/US-C515-BLDGCOR	669280.3182	1684889.5189
502	669485.4880	1685386.3880	4055.07	TU/US-C515-BLDGCOR	669291.4570	1684897.9275
503	669257.8420	1685415.0700	4053.20	TU/US-C513-STATION3	669063.8770	1684926.6012
504	669241.6200	1685431.8260	4053.43	TU/US-C513-STATION2	669047.6597	1684943.3523
505	669234.6840	1685421.2410	4053.75	TU/US-C513-STATION5	669040.7257	1684932.7704
506	669232.2550	1685409.8190	4053.42	TU/US-C513-STATION4	669038.2974	1684921.3517

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

Corrections

Point #515
TU/US-515-MW3 PVC

Point #518
TU/US-515-MW2

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
507	669220.1400	1685422.8010	4053.52	TU/US-C513-STATION1	669026.1859	1684934.3299
508	669222.4590	1685431.2530	4053.64	TU/US-C513-TANKPIT	669028.5042	1684942.7795
509	669219.3990	1685411.0450	4054.92	TU/US-C513-TANKPIT	669025.4451	1684922.5773
510	669260.7320	1685426.0370	4053.70	TU/US-C513-TANKPIT	669066.7661	1684937.5650
511	669277.6950	1685433.5720	4053.31	TU/US-C513-MW2-CASIN	669083.7242	1684945.0978
512	669243.5650	1685418.8110	4054.36	TU/US-C513-TRANSPAD	669049.6041	1684930.3411
513	669236.4970	1685419.8090	4054.30	TU/US-C513-TRANSPAD	669042.5381	1684931.3388
514	669235.5680	1685411.9050	4054.57	TU/US-C513-TRANSPAD	669041.6094	1684923.4371
515	669277.6850	1685433.6210	4053.26	TU/US-C513-MW2-C[illegible] PVC	669083.7142	1684945.1468 → MW3
516	669188.9570	1685441.5400	4053.76	TU/US-C513-MW1-CASIN	668995.0119	1684953.0635
517	669188.7180	1685441.6230	4053.31	TU/US-C513-MW1-PVC	668994.7730	1684953.1465
518	669175.0530	1685411.5360	4053.78	TU/US-C513-MW3-PVC	668981.1120	1684923.0682 → MW2
519	669175.2900	1685411.4450	4054.15	TU/US-C513-MW3-CASIN	668981.3489	1684922.9772
520	669194.6820	1685411.4540	4054.72	TU/US-C513-BLDGCOR	669000.7353	1684922.9862
521	669205.8290	1685420.1440	4054.47	TU/US-C513-BLDGCOR	669011.8790	1684931.6737
522	669292.6520	1685418.3920	4053.83	TU/US-C513-BLDGCOR	669098.6769	1684929.9222
523	669293.9380	1685428.2990	4053.77	TU/US-C513-BLDGCOR	669099.9625	1684939.8263
524	685879.9040	1686627.7590	4102.02	OTC-534-CASING	685681.1215	1686138.9387
525	685879.6290	1686627.7910	4101.61	OTC-534-PVC	685680.8466	1686138.9707
526	685894.0510	1686651.2940	4102.15	OTC-534-MW6-CASING	685695.2644	1686162.4669
527	685893.7240	1686651.3020	4101.74	OTC-534-MW6-PVC	685694.9375	1686162.4749
528	685866.3710	1686655.8860	4101.59	OTC-534-MW8-PVC	685667.5925	1686167.0576
529	685866.6060	1686655.6520	4102.06	OTC-534-MW8-CASING	685667.8274	1686166.8236
530	685876.1160	1686687.3140	4102.11	OTC-534-MW5-CASING	685677.3346	1686198.4764
531	685875.8760	1686687.4250	4101.81	OTC-534-MW5-PVC	685677.0947	1686198.5874
532	685834.9910	1686704.4610	4101.83	OTC-534-MW9-PVC	685636.2216	1686215.6185
533	685835.2820	1686704.5300	4102.15	OTC-534-MW9-CASING	685636.5125	1686215.6875
534	685772.4780	1686595.2240	4101.45	OTC-534-MW10-NG	685573.7267	1686106.4131
535	669081.1480	1678793.1860	4046.72	OTC-531B-SEPTANK	668887.2342	1678306.6363
536	669082.4390	1678801.3130	4046.63	OTC-531B-SEPTANK	668888.5248	1678314.7610
537	669072.3810	1678802.9790	4046.81	OTC-531B-SEPTANK	668878.4697	1678316.4265
538	669070.8860	1678795.3530	4046.82	OTC-531B-SEPTANK	668876.9751	1678308.8027
539	669104.1410	1678787.7690	4045.69	OTC-531B-STATION-1	668910.2205	1678301.2209
540	669070.9690	1678801.9800	4046.52	OTC-531B-STATION-2	668877.0581	1678315.4278
541	669061.4820	1678787.2510	4046.24	OTC-531B-STATION-3	668867.5739	1678300.7031
542	669022.2810	1678760.4940	4045.98	OTC-531B-MW-1-PVC	668828.3842	1678273.9538
543	669022.4740	1678760.4670	4046.35	OTC-531B-MW-1-CASING	668828.5772	1678273.9268
544	669029.7060	1678750.8610	4046.12	OTC-531B-LEACH	668835.8071	1678264.3236
545	669044.0770	1678753.3070	4046.04	OTC-531B-LEACH	668850.1739	1678266.7689
546	669048.2090	1678762.3910	4046.19	OTC-531B-LEACH	668854.3047	1678275.8503
547	669052.8600	1678773.5200	4046.17	OTC-531B-LEACH	668858.9544	1678286.9760
548	669051.8580	1678782.0380	4046.19	OTC-531B-LEACH	668857.9527	1678295.4916
549	669045.9680	1678791.0410	4045.97	OTC-531B-LEACH	668852.0644	1678304.4920
550	669037.6080	1678787.3270	4046.05	OTC-531B-LEACH	668843.7068	1678300.7790
551	669030.8940	1678787.9690	4046.07	OTC-531B-LEACH	668836.9947	1678301.4208
552	669024.6850	1678794.4050	4045.99	OTC-531B-LEACH	668830.7875	1678307.8550
553	669012.0060	1678808.0140	4045.98	OTC-531B-LEACH	668818.1122	1678321.4600
554	669005.0390	1678788.3970	4045.95	OTC-531B-LEACH	668811.1472	1678301.8487
555	669008.1540	1678771.5710	4046.05	OTC-531B-LEACH	668814.2613	1678285.0276
556	669012.3090	1678761.0960	4046.10	OTC-531B-LEACH	668818.4151	1678274.5556
557	669052.5660	1678784.6580	4046.08	OTC-531B-FLINE	668858.6605	1678298.1108
558	669071.4380	1678798.9230	4046.55	OTC-531B-FLINE	668877.5270	1678312.3717
559	669082.2160	1678797.7200	4046.58	OTC-531B-ELINE	668888.3019	1678311.1690
560	669109.7160	1678792.3340	4045.64	OTC-531B-ELINE	668915.7939	1678305.7846
561	669130.6340	1678787.5660	4047.05	OTC-531B-ELINE	668936.7058	1678301.0180
562	669132.6960	1678800.0880	4046.87	OTC-531B-BLDGCOR	668938.7672	1678313.5363
563	669139.6540	1678804.9540	4046.97	OTC-531B-BLDGCOR	668945.7232	1678318.4009
564	669127.3740	1678771.5760	4046.72	OTC-531B-BLDGCOR	668933.4468	1678285.0326
565	669131.8520	1678764.6150	4047.25	OTC-531B-BLDGCOR	668937.9235	1678278.0736
566	668593.1300	1678901.9680	4046.19	OTC-531C-BLDGCOR	668399.3576	1678415.3868
567	668588.1250	1678902.8360	4046.21	OTC-531C-BLDGCOR	668394.3541	1678416.2546
568	668585.3350	1678865.5840	4046.55	OTC-531C-BLDGCOR	668391.5649	1678379.0133
569	668590.1110	1678858.6070	4046.53	OTC-531C-BLDGCOR	668396.3395	1678372.0384
570	668590.3090	1678889.4560	4045.95	OTC-531C-ELINE	668396.5374	1678402.8784
571	668578.4210	1678891.4650	4046.03	OTC-531C-ELINE	668384.6529	1678404.8868
572	668560.7680	1678894.7530	4045.47	OTC-531C-ELINE	668367.0050	1678408.1739
573	668535.6480	1678899.2930	4046.35	OTC-531C-ELINE	668341.8923	1678412.7126
574	668535.0660	1678896.4960	4046.68	OTC-531C-SEPTIC	668341.3104	1678409.9164
575	668535.3940	1678905.9700	4046.47	OTC-531C-SEPTIC	668341.6383	1678419.3876
576	668522.2510	1678906.9450	4046.51	OTC-531C-SEPTIC	668328.4992	1678420.3624
577	668522.3100	1678897.4040	4046.39	OTC-531C-SEPTIC	668328.5581	1678410.8241

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
578	668561.9930	1678890.5660	4045.66	OTC-531C-STATION-1	668368.2296	1678403.9881
579	668531.2500	1678902.0810	4046.55	OTC-531C-STATION-2	668337.4955	1678415.4998
580	668522.9580	1678893.5110	4045.84	OTC-531C-STATION-3	668329.2059	1678406.9323
581	668521.6100	1678902.7660	4046.16	OTC-531C-FLINE	668327.8583	1678416.1846
582	668515.2610	1678901.5740	4045.66	OTC-531C-FLINE	668321.5112	1678414.9929
583	668515.8520	1678907.4010	4045.67	OTC-531C-LEACH	668322.1020	1678420.8182
584	668498.6960	1678906.8280	4045.81	OTC-531C-LEACH	668304.9510	1678420.2454
585	668489.9270	1678907.6430	4045.74	OTC-531C-LEACH	668296.1845	1678421.0602
586	668481.5760	1678902.8790	4045.69	OTC-531C-LEACH	668287.8359	1678416.2975
587	668476.1180	1678891.3230	4045.84	OTC-531C-LEACH	668282.3795	1678404.7449
588	668473.4290	1678883.0340	4045.68	OTC-531C-LEACH	668279.6913	1678396.4583
589	668473.7340	1678874.2510	4045.53	OTC-531C-LEACH	668279.9962	1678387.6778
590	668476.2360	1678867.2340	4045.54	OTC-531C-LEACH	668282.4975	1678380.6629
591	668482.1720	1678868.3950	4045.45	OTC-531C-MW-1-PVC	668288.4318	1678381.8235
592	668482.4510	1678868.3680	4045.85	OTC-531C-MW-1-CASING	668288.7107	1678381.7965
593	668490.9400	1678863.0190	4045.60	OTC-531C-LEACH	668297.1972	1678376.4491
594	668503.3450	1678866.8310	4045.87	OTC-531C-LEACH	668309.5986	1678380.2600
595	668508.4050	1678874.1920	4045.93	OTC-531C-LEACH	668314.6572	1678387.6189
596	668515.8970	1678879.7420	4045.82	OTC-531C-LEACH	668322.1470	1678393.1672
597	668524.3970	1678890.3500	4045.70	OTC-531C-LEACH	668330.6445	1678403.7722
598	667495.6300	1679128.7300	4042.53	OTC-532-BLDGCOR	667302.1757	1678642.0831
599	667488.6400	1679123.9580	4042.71	OTC-532-BLDGCOR	667295.1877	1678637.3125
600	667462.6660	1679059.4970	4041.10	OTC-532-BLDGCOR	667269.2212	1678572.8701
601	667481.1840	1679050.1710	4042.61	OTC-532-BLDGCOR	667287.7339	1678563.5469
602	667486.0130	1679106.7520	4042.73	OTC-532-ELINE	667292.5615	1678620.1115
603	667462.4800	1679111.5030	4040.38	OTC-532-ELINE	667269.0353	1678624.8611
604	667462.2250	1679114.4150	4040.62	OTC-532-STATION-1	667268.7804	1678627.7722
605	667442.0090	1679119.1410	4041.24	OTC-532-STATION-2	667248.5702	1678632.4969
606	667419.1640	1679115.1840	4040.86	OTC-532-STATION-3	667225.7319	1678628.5410
607	667385.6930	1679101.6040	4040.50	OTC-532-STATION-4	667192.2706	1678614.9649
608	667381.8850	1679101.5680	4040.62	OTC-532-LEACH	667188.4637	1678614.9290
609	667383.6400	1679091.6130	4040.63	OTC-532-LEACH	667190.2181	1678604.9768
610	667385.4250	1679087.0370	4040.57	OTC-532-LEACH	667192.0026	1678600.4022
611	667388.9960	1679084.4040	4040.65	OTC-532-LEACH	667195.5726	1678597.7699
612	667394.2390	1679084.6140	4040.73	OTC-532-LEACH	667200.8141	1678597.9799
613	667396.1210	1679092.7430	4040.70	OTC-532-LEACH	667202.6955	1678606.1065
614	667398.1240	1679100.9150	4040.70	OTC-532-LEACH	667204.6979	1678614.2761
615	667402.2360	1679106.9240	4040.75	OTC-532-LEACH	667208.8088	1678620.2834
616	667410.1270	1679109.8530	4040.82	OTC-532-LEACH	667216.6975	1678623.2116
617	667419.4540	1679110.1630	4040.85	OTC-532-LEACH	667226.0218	1678623.5215
618	667420.7270	1679120.1400	4041.02	OTC-532-FLINE	667227.2944	1678633.4956
619	667423.8510	1679141.7780	4040.59	OTC-532-LEACH	667230.4175	1678655.1273
620	667412.2990	1679143.4760	4040.74	OTC-532-LEACH	667218.8688	1678656.8248
621	667403.7350	1679143.1670	4040.80	OTC-532-LEACH	667210.3073	1678656.5159
622	667397.0900	1679139.6510	4040.75	OTC-532-LEACH	667203.6642	1678653.0009
623	667384.3300	1679127.9250	4040.44	OTC-532-LEACH	667190.9079	1678641.2783
624	667382.6070	1679116.1130	4040.44	OTC-532-LEACH	667189.1854	1678629.4697
625	667430.4810	1679118.6630	4041.32	OTC-532-FLINE	667237.0456	1678632.0190
626	667430.2210	1679114.2980	4041.25	OTC-532-SEPTIC	667236.7856	1678627.6553
627	667440.5880	1679113.0200	4041.26	OTC-532-SEPTIC	667247.1496	1678626.3776
628	667442.9470	1679123.3120	4041.21	OTC-532-SEPTIC	667249.5080	1678636.6667
629	667430.1210	1679125.8580	4041.28	OTC-532-SEPTIC	667236.6857	1678639.2119
630	667441.8110	1679116.2010	4041.27	OTC-532-ELINE	667248.3723	1678629.5577
631	669659.5140	1678688.1920	4048.05	OTC-531A-ELINE	669465.4326	1678201.6728
632	669645.1200	1678691.4170	4047.42	OTC-531A-ELINE	669451.0427	1678204.8968
633	669626.5240	1678694.6570	4048.54	OTC-531A-ELINE	669432.4521	1678208.1359
634	669625.4550	1678690.5680	4048.58	OTC-531A-SEPTIC	669431.3834	1678204.0481
635	669627.0130	1678697.2200	4048.59	OTC-531A-SEPTIC	669432.9410	1678210.6981
636	669614.1180	1678700.1730	4048.60	OTC-531A-SEPTIC	669420.0497	1678213.6503
637	669613.0940	1678693.8150	4048.72	OTC-531A-SEPTIC	669419.0260	1678207.2941
638	669648.5430	1678685.0250	4047.24	OTC-531A-STATION-1	669454.4647	1678198.5067
639	669615.3510	1678691.9600	4048.59	OTC-531A-STATION-2	669421.2823	1678205.4397
640	669607.0140	1678691.1700	4048.42	OTC-531A-STATION-3	669412.9478	1678204.6499
641	669606.7200	1678688.2040	4048.56	OTC-531A-LEACH	669412.6539	1678201.6848
642	669608.9270	1678706.1330	4048.28	OTC-531A-LEACH	669414.8602	1678219.6086
643	669601.3790	1678707.8980	4048.13	OTC-531A-LEACH	669407.3144	1678221.3730
644	669593.2420	1678708.2220	4047.49	OTC-531A-LEACH	669399.1798	1678221.6970
645	669578.1380	1678708.5010	4047.22	OTC-531A-LEACH	669384.0801	1678221.9759
646	669565.0490	1678706.1840	4047.29	OTC-531A-LEACH	669370.9949	1678219.6595
647	669554.2260	1678694.3690	4047.37	OTC-531A-LEACH	669360.1751	1678207.8480
648	669553.4160	1678687.6760	4047.59	OTC-531A-LEACH	669359.3653	1678201.1569

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
649	669552.5940	1678678.4030	4047.76	OTC-531A-LEACH	669358.5435	1678191.8866
650	669550.0120	1678656.4050	4047.76	OTC-531A-LEACH	669355.9623	1678169.8950
651	669556.1880	1678652.3190	4047.86	OTC-531A-LEACH	669362.1365	1678165.8102
652	669559.2580	1678655.8340	4047.38	OTC-531A-MW-1-PVC	669365.2056	1678169.3241
653	669559.5100	1678655.7600	4047.78	OTC-531A-MW-1-CASING	669365.4575	1678169.2502
654	669561.9190	1678650.8880	4047.69	OTC-531A-LEACH	669367.8658	1678164.3796
655	669569.0970	1678659.8040	4048.02	OTC-531A-LEACH	669375.0418	1678173.2930
656	669574.5390	1678669.0420	4047.77	OTC-531A-LEACH	669380.4822	1678182.5283
657	669580.0480	1678677.6210	4047.77	OTC-531A-LEACH	669385.9896	1678191.1048
658	669581.1180	1678685.2190	4047.72	OTC-531A-LEACH	669387.0593	1678198.7006
659	669589.3790	1678690.0080	4047.91	OTC-531A-LEACH	669395.3179	1678203.4882
660	669598.7410	1678687.4540	4047.88	OTC-531A-LEACH	669404.6772	1678200.9350
661	669608.6000	1678697.8630	4048.38	OTC-531A-FLINE	669414.5333	1678211.3410
662	669613.4950	1678697.0050	4048.61	OTC-531A-FLINE	669419.4269	1678210.4832
663	669434.7190	1685385.1220	4055.15	US/TC-515-EXAVATION	669240.7027	1684896.6618
664	669433.7320	1685375.0770	4054.68	US/TC-515-EXAVATION	669239.7160	1684886.6198
665	669453.6100	1685372.2880	4054.89	US/TC-515-EXAVATION	669259.5882	1684883.8316
666	669455.2490	1685382.6100	4055.08	US/TC-515-EXAVATION	669261.2268	1684894.1506
667	669423.1290	1685379.3360	4054.73	US/TC-515-POTHOLE-1	669229.1161	1684890.8775
668	669443.7270	1685362.1260	4054.20	US/TC-515-POTHOLE-2	669249.7081	1684873.6725
669	669443.2340	1685352.4030	4053.69	US/TC-515-POTHOLE-3	669249.2152	1684863.9523
670	669388.8600	1685382.9350	4054.36	US/TC-515-POTHOLE-4	669194.8570	1684894.4755
671	666075.3380	1693454.3920	4059.75	US/TC-502-TANK/EX	665882.2953	1692963.5932
672	666064.5480	1693454.6090	4059.59	US/TC-502-TANK/EX	665871.5084	1692963.8101
673	666064.5890	1693463.2320	4059.66	US/TC-502-TANK/EX	665871.5494	1692972.4306
674	666075.7420	1693463.6580	4059.85	US/TC-502-TANK/EX	665882.6992	1692972.8565
675	666070.2430	1693458.8620	4059.56	US/TC-502-STATION-1	665877.2018	1692968.0619
676	666075.3470	1693459.1030	4059.61	US/TC-502-STATION-2	665882.3043	1692968.3028
677	666070.4890	1693455.0470	4059.46	US/TC-502-STATION-3	665877.4477	1692964.2480
678	666070.2650	1693463.1340	4059.49	US/TC-502-STATION-4	665877.2238	1692972.3327
679	666072.2440	1693503.2780	4060.12	US/TC-502-FIREHY	665879.2022	1693012.4650
680	669813.9600	1693315.1950	4077.70	US/TC-503-EXAVATION	669619.8338	1692824.4365
681	669826.0790	1693326.7460	4077.45	US/TC-503-EXAVATION	669631.9493	1692835.9842
682	669815.4720	1693337.1950	4077.67	US/TC-503-EXAVATION	669621.3454	1692846.4302
683	669803.8000	1693324.4750	4077.59	US/TC-503-EXAVATION	669609.6767	1692833.7139
684	669818.2990	1693319.1730	4077.48	US/TC-503-BEGTRENCH	669624.1715	1692828.4134
685	669837.0790	1693303.2490	4076.88	US/TC-503-ENDTRENCH	669642.9461	1692812.4940
686	681138.0180	1690539.4590	4109.33	OTC-538-STATION-5	680940.6098	1690049.5050
687	673758.3950	1683356.5480	4060.55	US/TC-514-STATION-1	673563.1256	1682868.6758
688	673765.5540	1683358.1250	4060.47	US/TC-514-STATION-2	673570.2825	1682870.2523
689	673770.0890	1683350.4240	4060.48	US/TC-514-STATION-3	673574.8162	1682862.5535
690	673768.2490	1683354.2670	4060.48	US/TC-514-STATION-4	673572.9768	1682866.3954
691	673777.4280	1683353.4050	4060.71	US/TC-514-STATION-5	673582.1531	1682865.5337
692	673776.8350	1683359.0390	4060.94	US/TC-514-BLDGCOR	673581.5603	1682871.1661
693	673769.7480	1683353.9100	4060.70	US/TC-514-BLDGCOR	673574.4753	1682866.0385
694	673778.8570	1683370.4750	4060.92	US/TC-514-BLDGCOR	673583.5817	1682882.5987
695	673773.9440	1683377.3380	4060.70	US/TC-514-BLDGCOR	673578.6701	1682889.4597
696	673723.3370	1683411.0030	4060.56	US/TC-514-MW-1-PVC	673528.0778	1682923.1150
697	673723.6160	1683410.9000	4061.02	US/TC-514-MW-1-CASIN	673528.3567	1682923.0120
698	673699.2890	1683380.7720	4061.09	US/TC-514-MW-2-CASIN	673504.0367	1682892.8928
699	673698.9660	1683380.8260	4060.66	US/TC-514-MW-2-PVC	673503.7138	1682892.9467
700	673812.5550	1683317.4880	4060.43	US/TC-514-MW-3-PVC	673617.2699	1682829.6271
701	673812.8820	1683317.4350	4060.76	US/TC-514-MW-3-CASIN	673617.5968	1682829.5741
702	673776.7270	1683350.1350	4060.82	US/TC-514-FORM/TANK	673581.4523	1682862.2646
703	673777.3420	1683356.4370	4060.94	US/TC-514-FORM/TANK	673582.0671	1682868.5648
704	673759.1130	1683359.4810	4061.06	US/TC-514-FORM/TANK	673563.8434	1682871.6079
705	673757.7990	1683353.3170	4061.32	US/TC-514-FORM/TANK	673562.5298	1682865.4457
706	678061.9490	1684350.2580	4078.63	US/TC-516-FORMTANK	677865.4323	1683862.0978
707	678072.0100	1684348.4740	4078.61	US/TC-516-FORMTANK	677875.4904	1683860.3143
708	678074.0860	1684360.1530	4078.25	US/TC-516-FORMTANK	677877.5658	1683871.9899
709	678065.1290	1684362.4260	4078.47	US/TC-516-FORMTANK	677868.6114	1683874.2622
710	678069.6040	1684359.8850	4078.30	US/TC-516-STATION-1	677873.0851	1683871.7220
711	678064.5960	1684356.9350	4078.34	US/TC-516-STATION-2	677868.0786	1683868.7728
712	678066.1670	1684350.4200	4078.54	US/TC-516-STATION-3	677869.6491	1683862.2597
713	678072.9250	1684354.8490	4078.09	US/TC-516-STATION-4	677876.4052	1683866.6874
714	678101.7280	1684311.2380	4077.72	US/TC-516-MW-2	677905.1998	1683823.0891
715	678116.9250	1684291.3650	4077.78	US/TC-516-MW-2	677920.3924	1683803.2218
716	678061.7680	1684335.2520	4080.38	US/TC-516-BLDGCOR	677865.2514	1683847.0961
717	678064.6310	1684348.2080	4081.07	US/TC-516-BLDGCOR	677868.1136	1683860.0484
718	678026.7560	1684390.7900	4078.49	US/TC-516-MW-1	677830.2495	1683902.6180
719	678014.0050	1684363.8290	4077.81	US/TC-516-MW-3	677817.5022	1683875.6648

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
720	671269.9880	1692357.3370	4075.08	US/TC-508-FORM/TANK	671075.4398	1691866.8562
721	671299.4450	1692330.8640	4075.18	US/TC-508-FORM/TANK	671104.8883	1691840.3908
722	671324.3300	1692358.5130	4075.17	US/TC-508-FORM/TANK	671129.7661	1691868.0318
723	671294.8560	1692384.8580	4075.02	US/TC-508-FORM/TANK	671100.3006	1691894.3692
724	671311.5950	1692346.0080	4075.12	US/TC-508-STATION-2	671117.0347	1691855.5304
725	671302.2680	1692357.1830	4075.07	US/TC-508-STATION-1	671107.7104	1691866.7022
726	671312.4640	1692368.2800	4074.98	US/TC-508-STATION-4	671117.9035	1691877.7960
727	671282.5110	1692369.9060	4075.01	US/TC-508-STATION-3	671087.9592	1691879.4215
728	671289.2400	1692342.4620	4075.15	US/TC-508-STATION-5	671094.6862	1691851.9855
729	671373.3210	1692386.6060	4075.00	US/TC-508-MW-3-PVC	671178.7429	1691896.1167
730	671373.6120	1692386.5000	4075.33	US/TC-508-MW-3-CASIN	671179.0338	1691896.0107
731	671216.9160	1692488.1670	4075.54	US/TC-508-SS18-MW08-CASIN	671022.3832	1691997.6482
732	671216.7110	1692488.4340	4075.26	US/TC-508-SS18-MW08-PVC	671022.1782	1691997.9152
733	671236.3110	1692301.9320	4075.19	US/TC-508-MW-2-CASIN	671041.7726	1691811.4672
734	671236.1240	1692302.1450	4074.80	US/TC-508-MW-2-PVC	671041.5856	1691811.6801
735	671211.3090	1692324.4610	4075.35	US/TC-508-MW-1-CASIN	671016.7778	1691833.9897
736	671211.0360	1692324.6620	4074.93	US/TC-508-MW-1-PVC	671016.5049	1691834.1906
737	671174.1880	1692241.9700	4074.81	US/TC-508-SS18-MW16-PVC	670979.6676	1691751.5226
738	671174.4770	1692241.7880	4075.34	US/TC-508-SS18-MW16-CASIN	670979.9565	1691751.3406
739	671035.8870	1692106.1030	4074.42	US/TC-508-SS18-MW18-CASIN	670841.4066	1691615.6950
740	671035.6230	1692106.3690	4073.74	US/TC-508-SS18-MW18-PVC	670841.1427	1691615.9609
741	671043.1730	1692355.2630	4075.73	US/TC-508-SS18-MW19-PVC	670848.6905	1691864.7828
742	670383.2120	1691278.5670	4072.57	US/TC-504-MW-2-CASIN	670188.9208	1690788.3988
743	670383.0220	1691278.7790	4072.19	US/TC-504-MW-2-PVC	670188.7309	1690788.6107
744	670343.7050	1691297.2270	4072.57	US/TC-504-MW-1-PVC	670149.4253	1690807.0534
745	670343.9460	1691296.8630	4072.80	US/TC-504-MW-1-CASIN	670149.6662	1690806.6895
746	669680.3630	1678704.0610	4048.54	OTC-531A-BLDGCOR	669486.2755	1678217.5372
747	669673.4280	1678699.1340	4048.44	OTC-531A-BLDGCOR	669479.3425	1678212.6116
748	669662.1160	1678671.3190	4048.32	OTC-531A-BLDGCOR	669468.0338	1678184.8047
749	669671.0810	1678657.6480	4048.29	OTC-531A-BLDGCOR	669476.9962	1678171.1376
750	669671.6690	1678686.6260	4048.54	OTC-531A-ELINE	669477.5840	1678200.1072
751	670995.2900	1691723.6540	4072.55	US/TC-500-STATION-6	670800.8214	1691233.3568
752	682707.7150	1693994.3080	4139.12	OTC-539-SEPTIC	682509.8519	1693503.3527
753	682707.1360	1693987.5070	4139.01	OTC-539-SEPTIC	682509.2731	1693496.5537
754	682713.9270	1693987.3840	4139.07	OTC-539-SEPTIC	682516.0621	1693496.4307
755	682714.4020	1693993.8490	4139.12	OTC-539-SEPTIC	682516.5370	1693502.8939
756	682710.5050	1693994.2530	4139.11	OTC-539-ELINE	682512.6411	1693503.2977
757	682711.7750	1694038.3560	4139.83	OTC-539-ELINE	682513.9107	1693547.3880
758	682709.6340	1694009.1330	4139.38	OTC-539-STATION-1	682511.7704	1693518.1734
759	682715.9010	1693990.7160	4139.12	OTC-539-STATION-2	682518.0355	1693499.7618
760	682707.9950	1693985.7400	4139.05	OTC-539-STATION-3	682510.1318	1693494.7872
761	682690.1540	1693966.7430	4138.58	OTC-539-STATION-4	682492.2960	1693475.7957
762	682700.5510	1693984.6270	4139.10	OTC-539-LEACH	682502.6900	1693493.6745
763	682694.7220	1693978.9800	4138.75	OTC-539-LEACH	682496.8627	1693488.0292
764	682685.8570	1693975.5370	4138.62	OTC-539-LEACH	682488.0002	1693484.5872
765	682686.8260	1693963.6500	4138.56	OTC-539-LEACH	682488.9690	1693472.7036
766	682690.9260	1693959.9730	4138.78	OTC-539-LEACH	682493.0678	1693469.0277
767	682696.9840	1693956.9410	4138.94	OTC-539-LEACH	682499.1240	1693465.9966
768	682705.4410	1693958.5980	4139.12	OTC-539-LEACH	682507.5786	1693467.6531
769	682714.7430	1693968.3290	4139.32	OTC-539-LEACH	682516.8779	1693477.3813
770	682721.4010	1693976.8710	4139.30	OTC-539-LEACH	682523.5339	1693485.9208
771	682717.7930	1693983.8070	4139.35	OTC-539-LEACH	682519.9270	1693492.8548
772	682710.1830	1693984.5790	4139.16	OTC-539-FLINE	682512.3192	1693493.6265
773	682710.2190	1693987.2160	4139.18	OTC-539-FLINE	682512.3552	1693496.2628
774	682690.6020	1694039.4720	4139.43	OTC-539-BLDGCOR	682492.7439	1693548.5036
775	682684.8200	1694045.5030	4139.27	OTC-539-BLDGCOR	682486.9635	1693554.5329
776	682741.4000	1694039.0240	4140.22	OTC-539-BLDGCOR	682543.5271	1693548.0558
777	682747.1830	1694045.0970	4140.68	OTC-539-BLDGCOR	682549.3085	1693554.1270

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7824
PROFESSIONAL SURVEYOR

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
778	686068.4560	1686694.7280	4103.68	OTC-534-MW-10-PVC	685869.6189	1686205.8883
779	686068.7800	1686694.7810	4104.06	OTC-534-MW-10-CASING	685869.9428	1686205.9413
780	685846.6180	1686522.2590	4102.52	OTC-534-MW-11-CASING	685647.8452	1686033.4693
781	685846.3620	1686522.2240	4102.15	OTC-534-MW-11-PVC	685647.5893	1686033.4343
782	685670.3280	1686561.9490	4102.29	OTC-534-MW-12-PVC	685471.6063	1686073.1478
783	685670.6410	1686561.9860	4102.69	OTC-534-MW-12-CASING	685471.9192	1686073.1848

RAW DATA

HOLLOMAN AIR FORCE BASE
WEST SITE

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	684793.2210	1611172.5300	3911.93	BASE	684598.9178	1610715.3759
2	682531.9480	1628747.6200	3965.57	EC-30	682338.2864	1628285.4792
3	682452.1330	1628714.0920	3957.20	EC-30-2	682258.4940	1628251.9607
4	698323.2620	1606321.3780	3915.08	CHAS	698125.1198	1605865.6004
5	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
60	616427.1730	1576921.6540	3941.67	LUCERO	616252.2680	1576474.2182
61	600657.7750	1576446.9260	4131.58	GERI	600487.3444	1575999.6249
62	614156.5210	1568701.1170	4227.09	SW 30	613982.2602	1568256.0137
63	575518.1130	1586543.7100	4038.20	BRYCE AZ MK	575354.8155	1586093.5441
64	576512.9440	1582067.6800	4357.70	BRYCE	576349.3642	1581618.7841
65	633185.2600	1566510.7280	4417.64	HORN	633005.6000	1566066.2462
66	580320.9040	1585783.2080	4128.59	NICK 2	580156.2437	1585333.2579
67	682452.1790	1628714.1810	3957.10	EC-30-2	682258.5400	1628252.0496
68	698323.2620	1606321.3780	3914.70	CHAS	698125.1198	1605865.6004
69	698212.0050	1609477.2870	3928.40	CHUCK	698013.8943	1609020.6139
70	682531.9020	1628747.5310	3965.57	EC-30	682338.2404	1628285.3902
71	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
100	684194.1900	1611160.8710	3912.56	USTC-518-NG	684000.0567	1610703.7202
101	684194.8810	1611165.7430	3912.33	USTC-518-NG	684000.7475	1610708.5908
102	684188.7970	1611168.5190	3912.27	USTC-518-NG	683994.6653	1610711.3660
103	684189.4230	1611176.5450	3912.53	USTC-518-NG	683995.2911	1610719.3898
104	684179.6480	1611178.5150	3912.57	USTC-518-NG	683985.5189	1610721.3592
105	684178.1630	1611171.1680	3912.37	USTC-518-NG	683984.0343	1610714.0143
106	684177.1790	1611163.0630	3913.00	USTC-518-NG	683983.0506	1610705.9116
107	684157.6940	1611173.6700	3912.42	USTC-518-STATION-5	683963.5711	1610716.5156
108	684176.2170	1611179.5100	3912.28	USTC-518-STATION-4	683982.0888	1610722.3539
109	684175.8730	1611172.3430	3912.51	USTC-518-STATION-2	683981.7449	1610715.1890
110	684173.8830	1611163.3430	3912.65	USTC-518-STATION-3	683979.7555	1610706.1915
111	684189.5770	1611170.0220	3912.30	USTC-518-STATION-1	683995.4450	1610712.8686
112	684160.3220	1611172.8640	3912.49	USTC-518-POTHOLE-1	683966.1984	1610715.7098
113	684125.1520	1611185.2360	3910.93	USTC-518-MW-1	683931.0383	1610728.0783
114	684130.9190	1611216.0540	3911.17	USTC-518-MW-2	683936.8037	1610758.8876
115	684158.8770	1611187.1610	3912.34	USTC-518-BLDGCORN-70	683964.7538	1610730.0028
116	684163.9700	1611180.4420	3912.46	USTC-518-BLDGCORN-70	683969.8453	1610723.2857
117	684211.6690	1611174.1790	3912.47	USTC-518-BLDGCORN-70	684017.5308	1610717.0244
118	684218.3800	1611179.3060	3912.45	USTC-518-BLDGCORN-70	684024.2399	1610722.1500
119	684236.0190	1611144.8000	3911.88	USTC-518-NAIL	684041.8739	1610687.6538
120	684242.7800	1611133.9130	3911.77	USTC-518-NAIL	684048.6330	1610676.7699
121	684203.7200	1611162.6570	3912.21	USTC-518-STATION-6	684009.5840	1610705.5057

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7924
PROFESSIONAL SURVEYOR

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-074

Appendix G
Laboratory Analytical Data and Data Validation Checklists

Note: The data validation checklists and laboratory analytical data reports are provided as separate files.

Appendix H
Waste Manifests

HAFB-001

Generator's Name	Generator's Address	Generator's Telephone No.
USAF	550 TABOSA AVE Holloman AFB NM 88330	575-491-8262

Origin of Special Waste (Project or Spill Location): ~~White Sands National Monument Park - Storage Lagoons~~ Holloman AFB NM Bldg # 55

Transporter #1 Company Name	Address	Telephone No.
Southwest Disposal	1350 LaVelle Road	575-434-1109
Transporter #2 Company Name	Address	Telephone No.
	Alamogordo, NM 88310	

Destination Facility Name/Site Address	Facility ID (Permit) Number	Telephone No.
Otero/Greentree Regional Landfill 24 Mls South of Alamogordo, Hwy 54	SWM-109102	575-439-4355

Type and Proper Name of Special Waste	Container(s) No.	Container(s) Type	Total Quantity	Unit Wt/Vol	
Non RCRA/Non Hazardous Substance ~~(Treatment Plant Lagoon Sludge)~~ (soil)		SD		6.95	Tons

Additional Descriptions for Special Waste Listed Above:

Site Contact: Todd Hiltunen 307-214-6080

Special Handling Instructions:

Southwest Disposal - Lined and Covered Roll-off

GENERATOR'S CERTIFICATION I hereby certify that the contents of this shipment are fully and accurately described above by type and proper name of the special waste, and that such waste has been managed, packaged, containerized and labeled in accordance with the requirements of 20.9.8 NMAC (Special Waste Requirements) in addition to any other applicable federal, state or local regulations.

Truck # 553 Bin #

Printed/Typed Name:	Signature:	Date:
Todd Hiltunen for Brent Hunt (CES)	for Brent Hunt (CES)	9/25/12

Transporter 1 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:
David Gurnbach		9/26/12

Transporter 2 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:

Discrepancy Indication Space:

Analytical supplied to landfill

no facility ID number

Facility Owner or Operator: ***I hereby acknowledge receipt of the special waste as indicated upon this manifest, except as noted above in the Discrepancy Indication Space.***

Printed/Typed Name:	Signature:	Date:
Darrell McGinnis / Attendant		9-26-12

~~Facility~~

OTERO/GREENTREE
REGIONAL LANDFILL

TRANSACTION: 28,080

CO. NAME:

ADDRESS: Environmental Waste Solutions
1348 B. Redtail Hawk Drive

CITY & STATE: Boardman, OH 44512

DATE: 9/26/12 TIME: 9:07 am

TRUCK NO.: 198

GROSS WEIGHT 47000

TARE WEIGHT: 33100

NET TONS: 13900 6.95

COST $: [redacted]

5% TAX $:

TOTAL DUE $:

WASTE: 5

WASTE DESC.: Construction Debris
H.A.F.B.

WASTE ORIGIN:

DRIVER

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-074

Appendix I
Risk Evaluation Calculations

Risk Additivity
Soil Analytical Data
Building 1200 (OT-C537) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC537-IS-0001-071612		OTC537-IS-0002-071612		OTC537-IS-0003-071612		OTC537-IS-0004-071612		OTC537-IS-0005-071612		OTC537-IS-0006-071612		OTC537-IS-0007-071612-FD	
				Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
				Location	OTC537-Station 1 Influent to tank		OTC537-Station 1 Influent to tank		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**81.5**		**87.7**		**88.1**		**87.3**		**83.7**		**87.3**		**87.8**	
VOLATILES (mg/kg)																		
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0018	U	0.001	U	0.0011	U	0.0011	U	0.0014	U	0.0013	U	0.0011	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.002	U	0.0011	U	0.0012	U	0.0012	U	0.0015	U	0.0015	U	0.0012	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0028	U	0.0016	U	0.0017	U	0.0017	U	0.0022	U	0.0021	U	0.0017	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0018	U	0.001	U	0.0011	U	0.0011	U	0.0014	U	0.0013	U	0.0011	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0018	U	0.001	U	0.0011	U	0.0011	U	0.0014	U	0.0013	U	0.0011	U
1,1-DICHLOROETHENE	NE	240	449		0.0023	U	0.0013	U	0.0014	U	0.0014	U	0.0018	U	0.0017	U	0.0014	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.002	U	0.0011	U	0.0012	U	0.0012	U	0.0015	U	0.0015	U	0.0012	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0038	U	0.0022	U	0.0023	U	0.0023	U	0.0029	U	0.0028	U	0.0023	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.0016	U	0.00094	U	0.00098	U	0.00099	U	0.0013	U	0.0012	U	0.001	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0018	U	0.001	U	0.0011	U	0.0011	U	0.0014	U	0.0013	U	0.0011	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.0016	U	0.00094	U	0.00098	U	0.00099	U	0.0013	U	0.0012	U	0.001	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.002	U	0.0011	U	0.0012	U	0.0012	U	0.0015	U	0.0015	U	0.0012	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.002	U	0.0011	U	0.0012	U	0.0012	U	0.0015	U	0.0015	U	0.0012	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0018	U	0.001	U	0.0011	U	0.0011	U	0.0014	U	0.0013	U	0.0011	U
2-HEXANONE	NE	210	NE		0.0089	U	0.0051	U	0.0053	U	0.0053	U	0.0069	U	0.0066	U	0.0055	U
ACETONE	NE	61000	66600		0.033	U	0.019	U	0.02	U	0.02	U	0.026	U	0.025	U	0.02	U
BENZENE	NE	1.1	15.4		0.0025	U	0.0014	U	0.0015	U	0.0015	U	0.0019	U	0.0018	U	0.0015	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0018	U	0.001	U	0.0011	U	0.0011	U	0.0014	U	0.0013	U	0.0011	U
BROMOFORM	NE	62	616		0.0025	U	0.0014	U	0.0015	U	0.0015	U	0.0019	U	0.0018	U	0.0015	U
BROMOMETHANE	NE	7.3	16.5		0.0033	U	0.0019	U	0.002	U	0.002	U	0.0026	U	0.0025	U	0.002	U
CARBON DISULFIDE	NE	820	1530		0.0033	U	0.0019	U	0.002	U	0.002	U	0.0026	U	0.0025	U	0.002	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.003	U	0.0017	U	0.0018	U	0.0018	U	0.0023	U	0.0022	U	0.0018	U
CHLOROBENZENE	NE	290	376		0.0016	U	0.00094	U	0.00098	U	0.00099	U	0.0013	U	0.0012	U	0.001	U
CHLOROETHANE	NE	15000	29800		0.0033	U	0.0019	U	0.002	U	0.002	U	0.0026	U	0.0025	U	0.002	U
CHLOROFORM	NE	0.29	5.86		0.002	U	0.0011	U	0.0012	U	0.0012	U	0.0015	U	0.0015	U	0.0012	U
CHLOROMETHANE	NE	120	275		0.0033	U	0.0019	U	0.002	U	0.002	U	0.0026	U	0.0025	U	0.002	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0025	U	0.0014	U	0.0015	U	0.0015	U	0.0019	U	0.0018	U	0.0015	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0016	U	0.00094	U	0.00098	U	0.00099	U	0.0013	U	0.0012	U	0.001	U
CYCLOHEXANE	NE	7000	NE		0.0023	U	0.0013	U	0.0014	U	0.0014	U	0.0018	U	0.0017	U	0.0014	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.0016	U	0.00094	U	0.00098	U	0.00099	U	0.0013	U	0.0012	U	0.001	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0025	U	0.0014	U	0.0015	U	0.0015	U	0.0019	U	0.0018	U	0.0015	U
ETHYLBENZENE	NE	5.4	68.4		0.0016	U	0.00094	U	0.00098	U	0.00099	U	0.0013	U	0.0012	U	0.001	U
ISOPROPYLBENZENE	NE	2100	2430		0.0018	U	0.001	U	0.0011	U	0.0011	U	0.0014	U	0.0013	U	0.0011	U
METHYL ACETATE	NE	78000	78200		0.021	U	0.012	U	0.012	U	0.012	U	0.016	U	0.015	U	0.013	U
METHYL ETHYL KETONE	NE	28000	37100		0.01	U	0.0057	U	0.006	U	0.006	U	0.0078	U	0.0075	U	0.0062	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0091	U	0.0052	U	0.0054	U	0.0054	U	0.007	U	0.0067	U	0.0056	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0021	U	0.0012	U	0.0013	U	0.0013	U	0.0017	U	0.0016	U	0.0013	U
METHYLENE CHLORIDE	NE	56	409		0.0076	U	0.0043	U	0.0045	U	0.0045	U	0.0059	U	0.0056	U	0.0047	U

Risk Additivity
Soil Analytical Data
Building 1200 (OT-C537) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC537-IS-0001-071612		OTC537-IS-0002-071612		OTC537-IS-0003-071612		OTC537-IS-0004-071612		OTC537-IS-0005-071612		OTC537-IS-0006-071612		OTC537-IS-0007-071612-FD	
				Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
				Location	OTC537-Station 1 Influent to tank		OTC537-Station 1 Influent to tank		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																		
STYRENE	NE	6300	7280		0.0043	U	0.0024	U	0.0026	U	0.0026	U	0.0033	U	0.0032	U	0.0026	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0033	U	0.0019	U	0.002	U	0.002	U	0.0026	U	0.0025	U	0.002	U
TETRACHLOROETHYLENE	NE	22	7.02		0.0016	U	0.00094	U	0.00098	U	0.00099	U	0.0013	U	0.0012	U	0.001	U
TOLUENE	NE	5000	5270		0.002	U	0.0011	U	0.0012	U	0.0012	U	0.0015	U	0.0015	U	0.0012	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0025	U	0.0014	U	0.0015	U	0.0015	U	0.0019	U	0.0018	U	0.0015	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0018	U	0.001	U	0.0011	U	0.0011	U	0.0014	U	0.0013	U	0.0011	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.002	U	0.0011	U	0.0012	U	0.0012	U	0.0015	U	0.0015	U	0.0012	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0033	U	0.0019	U	0.002	U	0.002	U	0.0026	U	0.0025	U	0.002	U
VINYL CHLORIDE	NE	0.06	0.728		0.0025	U	0.0014	U	0.0015	U	0.0015	U	0.0019	U	0.0018	U	0.0015	U
XYLENES, TOTAL	NE	630	814		0.0053	U	0.003	U	0.0031	U	0.0032	U	0.0041	U	0.0039	U	0.0033	U
SEMIVOLATILES (mg/kg)																		
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
2,4-DICHLOROPHENOL	NE	180	183		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.026	U	0.024	U	0.023	U	0.024	U	0.025	U	0.024	U	0.024	U
2,4-DINITROPHENOL	NE	120	122		0.41	U	0.38	U	0.37	U	0.38	U	0.4	U	0.38	UJ	0.38	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
2,6-DINITROTOLUENE	NE	61	61.1		0.024	U	0.022	U	0.022	U	0.022	U	0.023	U	0.022	U	0.022	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
2-CHLOROPHENOL	NE	390	391		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
2-METHYLNAPHTHALENE	NE	230	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
2-METHYLPHENOL	NE	3100	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
2-NITROANILINE	NE	610	NE		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
2-NITROPHENOL	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
3-NITROANILINE	NE	NE	NE		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.082	U	0.075	U	0.074	U	0.075	U	0.08	U	0.075	UJ	0.076	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
4-CHLOROANILINE	NE	2.4	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
4-NITROANILINE	NE	24	NE		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
4-NITROPHENOL	NE	NE	NE		0.16	U	0.15	U	0.15	U	0.15	U	0.16	U	0.15	U	0.15	U
ACENAPHTHENE	NE	3400	3440		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
ACENAPHTHYLENE	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
ACETOPHENONE	NE	7800	7820		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
ANTHRACENE	NE	17000	17200		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
ATRAZINE	NE	2.1	NE		0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U

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Analyte			Sample Number	OTC537-IS-0001-071612		OTC537-IS-0002-071612		OTC537-IS-0003-071612		OTC537-IS-0004-071612		OTC537-IS-0005-071612		OTC537-IS-0006-071612		OTC537-IS-0007-071612-FD	
			Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
			Location	OTC537-Station 1 Influent to tank		OTC537-Station 1 Influent to tank		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		10 - 12	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																	
BENZALDEHYDE	NE	7800	NE	0.2	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.19	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
BENZO(A)PYRENE	NE	0.015	0.148	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
BIPHENYL	NE	51	57.1	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.082	U	0.075	U	0.074	U	0.075	U	0.08	U	0.075	U	0.076	U
CAPROLACTAM	NE	31000	NE	0.065	U	0.06	U	0.06	UJ	0.06	U	0.064	U	0.06	U	0.061	U
CARBAZOLE	NE	NE	NE	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
CHRYSENE	NE	15	148	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
DIBENZOFURAN	NE	78	NE	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
DIETHYL PHTHALATE	NE	49000	48900	0.082	U	0.075	U	0.074	U	0.075	U	0.08	U	0.075	U	0.076	U
DIMETHYL PHTHALATE	NE	611000	611000	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.082	U	0.075	U	0.074	U	0.075	U	0.08	U	0.075	U	0.076	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
FLUORANTHENE	NE	2300	2290	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
FLUORENE	NE	2300	2290	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.09	U	0.083	U	0.082	U	0.083	U	0.088	U	0.083	UJ	0.084	U
HEXACHLOROETHANE	NE	12	42.8	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.038	U	0.038	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
ISOPHORONE	NE	510	5120	0.02	U	0.019	U	0.019	U	0.019	U	0.02	UJ	0.019	U	0.019	U
M,P-CRESOL	NE	NE	NE	0.029	U	0.027	U	0.027	U	0.027	U	0.029	U	0.027	U	0.027	U
NAPHTHALENE	NE	3.6	43.0	0.033	U	0.03	U	0.03	U	0.03	U	0.032	U	0.03	U	0.03	U
NITROBENZENE	NE	4.8	53.5	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.25	U	0.23	U	0.22	U	0.23	U	0.24	U	0.23	U	0.23	U
PHENANTHRENE	NE	1830	1830	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
PHENOL	NE	18000	18300	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U
PYRENE	NE	1700	1720	0.02	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.019	U

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Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC537-IS-0001-071612		OTC537-IS-0002-071612		OTC537-IS-0003-071612		OTC537-IS-0004-071612		OTC537-IS-0005-071612		OTC537-IS-0006-071612		OTC537-IS-0007-071612-FD	
				Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
				Location	OTC537-Station 1 Influent to tank		OTC537-Station 1 Influent to tank		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		10 - 12	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	
EXPLOSIVES (mg/kg)																		
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
1,3-DINITROBENZENE	NE	6.10	NE	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
2,4-DINITROTOLUENE	NE	1.60	15.7	0.087	U	0.088	U	0.075	U	0.082	U	0.09	U	0.072	U	0.092	U	
2,6-DINITROTOLUENE	NE	61.0	61.1	0.078	U	0.079	U	0.067	U	0.073	U	0.081	U	0.064	U	0.083	U	
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
2-NITROTOLUENE	NE	2.90	29.1	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
3-NITROTOLUENE	NE	6.10	7.82	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
4-NITROTOLUENE	NE	30.0	244.4	0.091	U	0.091	U	0.078	U	0.085	U	0.094	U	0.075	U	0.096	U	
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
NITROBENZENE	NE	4.80	53.5	0.083	U	0.084	U	0.072	U	0.078	U	0.086	U	0.069	U	0.089	U	
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
TETRYL	NE	240.0	244.0	0.072	U	0.072	U	0.062	U	0.067	U	0.074	U	0.059	U	0.076	U	
PCBS (mg/kg)																		
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0081	U	0.0076	U	0.0075	UJ	0.0076	U	0.0079	U	0.0076	U	0.0075	U	
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.01	U	0.0095	U	0.0094	U	0.0095	U	0.0099	U	0.0095	U	0.0093	U	
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.01	U	0.0095	U	0.0094	U	0.0095	U	0.0099	U	0.0095	U	0.0093	U	
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0081	U	0.0076	U	0.0075	U	0.0076	U	0.0079	U	0.0076	U	0.0075	U	
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0081	U	0.0076	U	0.0075	U	0.0076	U	0.0079	U	0.0076	U	0.0075	U	
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0081	U	0.0076	U	0.0075	U	0.0076	U	0.0079	U	0.0076	U	0.0075	U	
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0081	U	0.0076	U	0.0075	UJ	0.0076	U	0.0079	U	0.0076	U	0.0075	U	
METALS (mg/kg)																		
ALUMINUM	13722	77000	78000	1450		3790		4970	J	7700		1010		6320		5730		
ANTIMONY	1.6	31	31.3	1.9	U	0.78	U	1.1	UJ	0.84	U	1.1	U	0.94	U	0.84	U	
ARSENIC	3.7	0.39	3.90	1.1	J	0.78	U	1.3	J	2.6	J	1.1	U	1.4	J	1.6	J	
BARIUM	169	15000	15600	26.7	J	35.3	J	39.6	J	90.2		17.7	J	49	J	46.8	J	
BERYLLIUM	1.6	160	156	0.46	U	0.39	U	0.55	U	0.49	J	0.54	U	0.47	U	0.42	U	
CADMIUM	0.3	70	70.3	0.93	U	0.39	U	0.55	U	0.42	U	0.54	U	0.47	U	0.42	U	
CALCIUM	317332	NE	NE	254000		178000		198000		165000		297000		199000		215000		
CHROMIUM[d]	25	117000	117000	1.4	J	4.1		5.4	J	9.6		0.7	J	7.2		6.7		
COBALT	7.7	23	NE	1.1	J	1.4	J	1.8	J	4.6	J	0.59	J	2.5	J	2.3	J	
COPPER	13	3100	3130	1.4	J	2.5	J	2.9	J	6.9	J	1.2	J	3.6	J	3.7	J	
IRON	23049	55000	54800	1110		3660		4780	J	8780		915		6050		5560		
LEAD	10.9	400	400	0.93	U	2.2	J	2.8	J	5.7	J	2.6	J	4	J	4.5	J	
MAGNESIUM	16991	NE	NE	3660		2770		2560	J	4560		788	J	3190		2980		
MANGANESE	393	1800	1860	21.6		74.7		89.2	J	365		35.8		107		101		
MERCURY	10.8	10	15.6	0.0097	U	0.0088	U	0.0092	U	0.047	J	0.0095	U	0.0089	U	0.009	U	
NICKEL	17.4	1500	1560	1.8	J	3.3	J	4.2	J	10	J	1.5	J	5.7	J	5.1	J	
POTASSIUM	5077	NE	NE	406	J	888	J	1110	J	1580	J	282	J	1410	J	1300	J	

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Analyte			Sample Number	OTC537-IS-0001-071612		OTC537-IS-0002-071612		OTC537-IS-0003-071612		OTC537-IS-0004-071612		OTC537-IS-0005-071612		OTC537-IS-0006-071612		OTC537-IS-0007-071612-FD	
			Sample Date	7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012		7/16/2012	
			Location	OTC537-Station 1 Influent to tank		OTC537-Station 1 Influent to tank		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit		OTC537-Station 3 south of tank / earthen pit	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		10 - 12	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
METALS - continued (mg/kg)																	
SELENIUM	1.4	390	391	3.7	U	1.6	U	2.2	U	1.7	U	2.2	U	1.9	U	1.7	U
SILVER	1.1	390	391	0.46	U	0.39	U	0.55	U	0.42	U	0.54	U	0.47	U	0.42	U
SODIUM	5196	NE	NE	1870	J	1020	J	610	U	460	U	600	U	698	J	605	J
THALLIUM	1.3	0.78	0.782	2.4	U	1	U	1.4	U	1.1	U	1.4	U	1.2	U	1.1	U
VANADIUM	42.6	390	391	7.4	J	7.9	J	9.6	J	19.7	J	2.8	J	11.9	J	11	J
ZINC	54.6	23000	23500	4.6	U	10.1		12.9		26.5		2.7	U	16.7		14.9	
PETROLEUM HYDROCARBONS (mg/kg)																	
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	3.8	U	2.7	U	3	U	3.2	U	4.1	U	3.1	U	3	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	4.1	U	3.8	U	3.7	U	3.8	U	4	U	3.8	U	3.7	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000	4.1	U	3.8	U	3.7	U	3.8	U	4	U	3.8	U	3.7	U
CYANIDE (mg/kg)																	
CYANIDE	NE	22.0	46.9	0.071	U	0.066	U	0.067	U	0.067	U	0.07	U	0.069	U	0.066	U
TRITIUM (pCi/g)																	
TRITIUM	NE	NE	NE	5.2	U	5.28	U	5.23	U	5.14	U	5.17	U	5.02	U	5.19	U

Risk Additivity
Soil Analytical Data
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Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]
			Sample Number
			Sample Date
			Location
			Depth (ft bgs)
PERCENT SOLIDS	NE	NE	NE
VOLATILES (mg/kg)			
1,1,1-TRICHLOROETHANE	NE	8700	15600
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100
1,1,2-TRICHLOROETHANE	NE	1.1	2.81
1,1-DICHLOROETHANE	NE	3.3	64.5
1,1-DICHLOROETHENE	NE	240	449
1,2,4-TRICHLOROBENZENE	NE	22	73.0
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86
1,2-DIBROMOETHANE	NE	0.034	0.588
1,2-DICHLOROBENZENE	NE	1900	2310
1,2-DICHLOROETHANE	NE	0.43	7.89
1,2-DICHLOROPROPANE	NE	0.94	15.2
1,3-DICHLOROBENZENE	NE	NE	NE
1,4-DICHLOROBENZENE	NE	2.4	31.7
2-HEXANONE	NE	210	NE
ACETONE	NE	61000	66600
BENZENE	NE	1.1	15.4
BROMODICHLOROMETHANE	NE	0.27	5.41
BROMOFORM	NE	62	616
BROMOMETHANE	NE	7.3	16.5
CARBON DISULFIDE	NE	820	1530
CARBON TETRACHLORIDE	NE	0.61	10.8
CHLOROBENZENE	NE	290	376
CHLOROETHANE	NE	15000	29800
CHLOROFORM	NE	0.29	5.86
CHLOROMETHANE	NE	120	275
CIS-1,2-DICHLOROETHYLENE	NE	160	156
CIS-1,3-DICHLOROPROPENE	NE	NE	NE
CYCLOHEXANE	NE	7000	NE
DIBROMOCHLOROMETHANE	NE	0.68	12.1
DICHLORODIFLUOROMETHANE	NE	94	168
ETHYLBENZENE	NE	5.4	68.4
ISOPROPYLBENZENE	NE	2100	2430
METHYL ACETATE	NE	78000	78200
METHYL ETHYL KETONE	NE	28000	37100
METHYL ISOBUTYL KETONE	NE	5300	5820
METHYLCYCLOHEXANE	NE	5630	5630
METHYLENE CHLORIDE	NE	56	409

Risk Additivity Evaluation at Building 1200, Holloman AFB

Analyte	C / N	0-10 ft bgs Max Hit (mg/kg)	Cancer Risk	NC ratio
1,1,1-TRICHLOROETHANE		ND		
1,1,2,2-TETRACHLOROETHANE		ND		
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND		
1,1,2-TRICHLOROETHANE		ND		
1,1-DICHLOROETHANE		ND		
1,1-DICHLOROETHENE		ND		
1,2,4-TRICHLOROBENZENE		ND		
1,2-DIBROMO-3-CHLOROPROPANE		ND		
1,2-DIBROMOETHANE		ND		
1,2-DICHLOROBENZENE		ND		
1,2-DICHLOROETHANE		ND		
1,2-DICHLOROPROPANE		ND		
1,3-DICHLOROBENZENE		ND		
1,4-DICHLOROBENZENE		ND		
2-HEXANONE		ND		
ACETONE		ND		
BENZENE		ND		
BROMODICHLOROMETHANE		ND		
BROMOFORM		ND		
BROMOMETHANE		ND		
CARBON DISULFIDE		ND		
CARBON TETRACHLORIDE		ND		
CHLOROBENZENE		ND		
CHLOROETHANE		ND		
CHLOROFORM		ND		
CHLOROMETHANE		ND		
CIS-1,2-DICHLOROETHYLENE		ND		
CIS-1,3-DICHLOROPROPENE		ND		
CYCLOHEXANE		ND		
DIBROMOCHLOROMETHANE		ND		
DICHLORODIFLUOROMETHANE		ND		
ETHYLBENZENE		ND		
ISOPROPYLBENZENE		ND		
METHYL ACETATE		ND		
METHYL ETHYL KETONE		ND		
METHYL ISOBUTYL KETONE		ND		
METHYLCYCLOHEXANE		ND		
METHYLENE CHLORIDE		ND		

Risk Additivity
Soil Analytical Data
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Analyte			Sample Number	Risk Additivity Evaluation at Building 1200, Holloman AFB				
			Sample Date					
			Location					
			Depth (ft bgs)			0-10 ft bgs		
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
VOLATILES - continued (mg/kg)				VOLATILES - continued (mg/kg)				
STYRENE	NE	6300	7280	STYRENE		ND		
TERT-BUTYL METHYL ETHER	NE	43	901	TERT-BUTYL METHYL ETHER		ND		
TETRACHLOROETHYLENE	NE	22	7.02	TETRACHLOROETHYLENE		ND		
TOLUENE	NE	5000	5270	TOLUENE		ND		
TRANS-1,2-DICHLOROETHENE	NE	150	270	TRANS-1,2-DICHLOROETHENE		ND		
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	TRANS-1,3-DICHLOROPROPENE		ND		
TRICHLOROETHYLENE	NE	0.91	8.77	TRICHLOROETHYLENE		ND		
TRICHLOROFLUOROMETHANE	NE	790	1410	TRICHLOROFLUOROMETHANE		ND		
VINYL CHLORIDE	NE	0.06	0.728	VINYL CHLORIDE		ND		
XYLENES, TOTAL	NE	630	814	XYLENES, TOTAL		ND		
SEMIVOLATILES (mg/kg)				SEMIVOLATILES (mg/kg)				
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	2,2'-OXYBIS(1-CHLORO)PROPANE		ND		
2,4,5-TRICHLOROPHENOL	NE	6100	6110	2,4,5-TRICHLOROPHENOL		ND		
2,4,6-TRICHLOROPHENOL	NE	44	61.1	2,4,6-TRICHLOROPHENOL		ND		
2,4-DICHLOROPHENOL	NE	180	183	2,4-DICHLOROPHENOL		ND		
2,4-DIMETHYLPHENOL	NE	1200	1220	2,4-DIMETHYLPHENOL		ND		
2,4-DINITROPHENOL	NE	120	122	2,4-DINITROPHENOL		ND		
2,4-DINITROTOLUENE	NE	1.6	15.7	2,4-DINITROTOLUENE		ND		
2,6-DINITROTOLUENE	NE	61	61.1	2,6-DINITROTOLUENE		ND		
2-CHLORONAPHTHALENE	NE	6300	6260	2-CHLORONAPHTHALENE		ND		
2-CHLOROPHENOL	NE	390	391	2-CHLOROPHENOL		ND		
2-METHYLNAPHTHALENE	NE	230	NE	2-METHYLNAPHTHALENE		ND		
2-METHYLPHENOL	NE	3100	NE	2-METHYLPHENOL		ND		
2-NITROANILINE	NE	610	NE	2-NITROANILINE		ND		
2-NITROPHENOL	NE	NE	NE	2-NITROPHENOL		ND		
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	3,3'-DICHLOROBENZIDINE		ND		
3-NITROANILINE	NE	NE	NE	3-NITROANILINE		ND		
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	4,6-DINITRO-2-METHYLPHENOL		ND		
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	4-BROMOPHENYL PHENYL ETHER		ND		
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	4-CHLORO-3-METHYLPHENOL		ND		
4-CHLOROANILINE	NE	2.4	NE	4-CHLOROANILINE		ND		
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	4-CHLOROPHENYL PHENYL ETHER		ND		
4-NITROANILINE	NE	24	NE	4-NITROANILINE		ND		
4-NITROPHENOL	NE	NE	NE	4-NITROPHENOL		ND		
ACENAPHTHENE	NE	3400	3440	ACENAPHTHENE		ND		
ACENAPHTHYLENE	NE	NE	NE	ACENAPHTHYLENE		ND		
ACETOPHENONE	NE	7800	7820	ACETOPHENONE		ND		
ANTHRACENE	NE	17000	17200	ANTHRACENE		ND		
ATRAZINE	NE	2.1	NE	ATRAZINE		ND		

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Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number / Sample Date / Location / Depth (ft bgs)
SEMIVOLATILES - continued (mg/kg)				
BENZALDEHYDE	NE	7800	NE	
BENZO(A)ANTHRACENE	NE	0.15	1.48	
BENZO(A)PYRENE	NE	0.015	0.148	
BENZO(B)FLUORANTHENE	NE	0.15	1.48	
BENZO(G,H,I)PERYLENE	NE	NE	NE	
BENZO(K)FLUORANTHENE	NE	1.5	14.8	
BENZYL BUTYL PHTHALATE	NE	260	NE	
BIPHENYL	NE	51	57.1	
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	
CAPROLACTAM	NE	31000	NE	
CARBAZOLE	NE	NE	NE	
CHRYSENE	NE	15	148	
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	
DIBENZOFURAN	NE	78	NE	
DIETHYL PHTHALATE	NE	49000	48900	
DIMETHYL PHTHALATE	NE	611000	611000	
DI-N-BUTYL PHTHALATE	NE	6100	6110	
DI-N-OCTYLPHTHALATE	NE	730	NE	
FLUORANTHENE	NE	2300	2290	
FLUORENE	NE	2300	2290	
HEXACHLOROBENZENE	NE	0.3	3.04	
HEXACHLOROBUTADIENE	NE	6.2	61.1	
HEXACHLOROCYCLOPENTADIENE	NE	370	367	
HEXACHLOROETHANE	NE	12	42.8	
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	
ISOPHORONE	NE	510	5120	
M,P-CRESOL	NE	NE	NE	
NAPHTHALENE	NE	3.6	43.0	
NITROBENZENE	NE	4.8	53.5	
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	
N-NITROSODIPHENYLAMINE	NE	99	993	
PENTACHLOROPHENOL	NE	0.89	8.94	
PHENANTHRENE	NE	1830	1830	
PHENOL	NE	18000	18300	
PYRENE	NE	1700	1720	

Risk Additivity Evaluation at Building 1200, Holloman AFB

Analyte	C / N	0-10 ft bgs Max Hit (mg/kg)	Cancer Risk	NC ratio
SEMIVOLATILES - continued (mg/kg)				
BENZALDEHYDE		ND		
BENZO(A)ANTHRACENE		ND		
BENZO(A)PYRENE		ND		
BENZO(B)FLUORANTHENE		ND		
BENZO(G,H,I)PERYLENE		ND		
BENZO(K)FLUORANTHENE		ND		
BENZYL BUTYL PHTHALATE		ND		
BIPHENYL		ND		
BIS(2-CHLOROETHOXY) METHANE		ND		
BIS(2-CHLOROETHYL) ETHER		ND		
BIS(2-ETHYLHEXYL) PHTHALATE		ND		
CAPROLACTAM		ND		
CARBAZOLE		ND		
CHRYSENE		ND		
DIBENZ(A,H)ANTHRACENE		ND		
DIBENZOFURAN		ND		
DIETHYL PHTHALATE		ND		
DIMETHYL PHTHALATE		ND		
DI-N-BUTYL PHTHALATE		ND		
DI-N-OCTYLPHTHALATE		ND		
FLUORANTHENE		ND		
FLUORENE		ND		
HEXACHLOROBENZENE		ND		
HEXACHLOROBUTADIENE		ND		
HEXACHLOROCYCLOPENTADIENE		ND		
HEXACHLOROETHANE		ND		
INDENO(1,2,3-C,D)PYRENE		ND		
ISOPHORONE		ND		
M,P-CRESOL		ND		
NAPHTHALENE		ND		
NITROBENZENE		ND		
N-NITROSODI-N-PROPYLAMINE		ND		
N-NITROSODIPHENYLAMINE		ND		
PENTACHLOROPHENOL		ND		
PHENANTHRENE		ND		
PHENOL		ND		
PYRENE		ND		

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Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]
			Sample Number
			Sample Date
			Location
			Depth (ft bgs)
EXPLOSIVES (mg/kg)			
1,3,5-TRINITROBENZENE	NE	2200.0	NE
1,3-DINITROBENZENE	NE	6.10	NE
2,4,6-TRINITROTOLUENE	NE	19.0	39.1
2,4-DINITROTOLUENE	NE	1.60	15.7
2,6-DINITROTOLUENE	NE	61.0	61.1
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE
2-NITROTOLUENE	NE	2.90	29.1
3-NITROTOLUENE	NE	6.10	7.82
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE
4-NITROTOLUENE	NE	30.0	244.4
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2
NITROBENZENE	NE	4.80	53.5
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7
TETRYL	NE	240.0	244.0
PCBS (mg/kg)			
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22
METALS (mg/kg)			
ALUMINUM	13722	77000	78000
ANTIMONY	1.6	31	31.3
ARSENIC	3.7	0.39	3.90
BARIUM	169	15000	15600
BERYLLIUM	1.6	160	156
CADMIUM	0.3	70	70.3
CALCIUM	317332	NE	NE
CHROMIUM[d]	25	117000	117000
COBALT	7.7	23	NE
COPPER	13	3100	3130
IRON	23049	55000	54800
LEAD	10.9	400	400
MAGNESIUM	16991	NE	NE
MANGANESE	393	1800	1860
MERCURY	10.8	10	15.6
NICKEL	17.4	1500	1560
POTASSIUM	5077	NE	NE

Risk Additivity Evaluation at Building 1200, Holloman AFB

Analyte	C / N	0-10 ft bgs Max Hit (mg/kg)	Cancer Risk	NC ratio	
EXPLOSIVES (mg/kg)					
1,3,5-TRINITROBENZENE		ND			
1,3-DINITROBENZENE		ND			
2,4,6-TRINITROTOLUENE		ND			
2,4-DINITROTOLUENE		ND			
2,6-DINITROTOLUENE		ND			
2-AMINO-4,6-DINITROTOLUENE		ND			
2-NITROTOLUENE		ND			
3-NITROTOLUENE		ND			
4-AMINO-2,6-DINITROTOLUENE		ND			
4-NITROTOLUENE		ND			
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE		ND			
NITROBENZENE		ND			
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE		ND			
TETRYL		ND			
PCBS (mg/kg)					
PCB-1016 (AROCLOR 1016)		ND			
PCB-1221 (AROCLOR 1221)		ND			
PCB-1232 (AROCLOR 1232)		ND			
PCB-1242 (AROCLOR 1242)		ND			
PCB-1248 (AROCLOR 1248)		ND			
PCB-1254 (AROCLOR 1254)		ND			
PCB-1260 (AROCLOR 1260)		ND			
METALS (mg/kg)					
ALUMINUM	N	4970		0.064	
ANTIMONY		ND			
ARSENIC	C	1.3	3.33E-06		
BARIUM	N	39.6		0.0025	
BERYLLIUM		ND			
CADMIUM		ND			
CALCIUM	NUTRIENT	297000			
CHROMIUMd	N	5.4		0.000046	
COBALT	N	1.8		0.078	RSL
COPPER	N	2.9		0.00093	
IRON	N	4780		0.087	
LEAD	N	2.8		0.0070	
MAGNESIUM	NUTRIENT	3660			
MANGANESE	N	89.2		0.048	
MERCURY		ND			
NICKEL	N	4.2		0.0027	
POTASSIUM	NUTRIENT	1110			

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Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number / Sample Date / Location / Depth (ft bgs)
METALS - continued (mg/kg)				
SELENIUM	1.4	390	391	
SILVER	1.1	390	391	
SODIUM	5196	NE	NE	
THALLIUM	1.3	0.78	0.782	
VANADIUM	42.6	390	391	
ZINC	54.6	23000	23500	
PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	
OIL RANGE ORGANICS C28-C40	NE	NE	1000	
CYANIDE (mg/kg)				
CYANIDE	NE	22.0	46.9	
TRITIUM (pCi/g)				
TRITIUM	NE	NE	NE	

Risk Additivity Evaluation at Building 1200, Holloman AFB

Analyte	C / N	0-10 ft bgs Max Hit (mg/kg)	Cancer Risk	NC ratio
METALS - continued (mg/kg)				
SELENIUM		ND		
SILVER		ND		
SODIUM	NUTRIENT	1870		
THALLIUM		ND		
VANADIUM	N	9.6		0.025
ZINC	N	12.9		0.00055
PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10		ND		
DIESEL RANGE ORGANICS C10-C28		ND		
OIL RANGE ORGANICS C28-C40		ND		
CYANIDE (mg/kg)				
CYANIDE		N		
TRITIUM (pCi/g)				
TRITIUM		N		
SUM:			**3.33E-06**	**0.32**

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Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

EPA = U.S. Environmental Protection Agency
FD = field duplicate
ft bgs = feet below ground surface
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

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Appendix J
Ecological Evaluation

NEW MEXICO ENVIRONMENT DEPARTMENT
SITE ASSESSMENT CHECKLIST
(From NMED (2012) Attachment A)

I. SITE LOCATION

1. Site Name: Building 1200 (OT-C537) Inactive Septic System
   US EPA I.D. Number: NM6572124422
   Location: Tularosa Basin within Holloman Air Force Base (HAFB)
   County: Otero
   City: HAFB _____ State: NM

2. Latitude: 32º 52´ 21.989˝ N Longitude: 106º 5´ 18.950˝ W

3. Attach site maps, including a topographical map, a diagram which illustrates the layout of the facility (e.g., site boundaries, structures, etc.), and maps showing all habitat areas identified in Section III of the checklist. Also, include maps which illustrate known release areas, sampling locations, and any other important features, if available.

Note: Site maps and supporting information that include (1) a Physiographic Map, (2) a Site Layout and Sampling Location Map, and (3) a Site Photo Log are generally included for all sites in the RFI reports. A site habitat map and a Google Earth photo that shows the site habitat are attached to this Site Assessment Checklist.

II. SITE CHARACTERIZATION

1. Indicate the approximate area of the site (i.e., acres or sq. ft):

   Buildings 1200 and 1201 are collocated and together occupy a site approximately 6 acres in size.

2. Provide an approximate breakdown of the land uses on the site:

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	_____% Undisturbed	100% Other[c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, etc.):

_____

[b]For agricultural areas, please list the crops and/or livestock which are present:

_____

[c]For areas designated as "other", please describe the usage of the area:

Building 1200, historically known as the Space Biology Laboratory, was constructed in 1954 as one of several laboratories used for aeromedical research and is associated with the Primate Research Facility. The Septic Tanks Report (provided in Appendix A) indicates that the building contained a lead-lined x-ray room, autopsy room, surgery room, dark room, and animal pens. At the time of a survey conducted in 1995, the building was vacant and unused. During a site inspection conducted in 2007, it was discovered that the bathroom drain was separate from the work area drain and that all floor drains had been plugged. Abandonment records prepared by North Wind, Inc. state that rather than locating a septic tank at Building 1200, an earthen pit with a concrete cover was identified and abandoned in place by backfilling the pit with clean fill (North Wind, Inc., 2008).

3. Provide an approximate breakdown of the land uses in the area surrounding the site. Indicate the radius (in miles) of the area described: approximately 0.5 mile

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	80 % Undisturbed	20 % Other [c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, golf course, etc.):

_____

[b]For agricultural areas, please list the crops and/or livestock which are present:

_____

[c]For areas designated as "other", please describe the usage of the area:
Habitat Map for Holloman AFB (attached) shows that habitat within 0.5 mile radius is dominated by fourwing saltbush/alkali sacaton shrubland. To the north of the site there is a mix of fourwing saltbush/alkali sacaton shrubland, fourwing saltbush shrubland with honey mesquite, and fourwing saltbush gypsum dropseed shrubland. There is also some areas to the northeast of the site that are shown as Development/Ground Disturbance.

4. Describe reasonable and likely future land and/or water use(s) at the site.
Land use is likely to remain the same.

5. Describe the historical uses of the site. Include information on chemical releases that may have occurred as a result of previous land uses. For each chemical release, provide information on the form of the chemical released (i.e., solid, liquid, vapor) and the known or suspected causes or mechanism of the release (i.e., spills, leaks, material disposal, dumping, explosion, etc.).

_____

Building 1200, historically known as the Space Biology Laboratory, was constructed in 1954 as one of several laboratories used for aeromedical research and is associated with the Primate Research Facility. The Septic Tanks Report (provided in Appendix A) indicates that the building contained a lead-lined x-ray room, autopsy room,

surgery room, dark room, and animal pens. At the time of a survey conducted in 1995, the building was vacant and unused, and the building was unused at the time of the RFI field investigation. Site use is likely to remain the same.

6. If any movement of soil has taken place at the site, describe the degree of the disturbance. Indicate the likely source of any disturbances (e.g., erosion, agricultural, mining, industrial activities, removals, etc.) and estimate when these events occurred.

Site disturbances of soil have been limited to excavation activities associated with building construction and septic system installation and septic system closure activities.

7. Describe the current uses of the site. Include information on recent (previous 5 years) disturbances or chemical releases that have occurred. For each chemical release, provide information on the form of the chemical released and the causes or mechanism of the release.

The site is currently unused. Abandonment records prepared by North Wind, Inc. state that rather than locating a septic tank at Building 1200, an earthen pit with a concrete cover was identified and abandoned in place by backfilling the pit with clean fill (North Wind, Inc., 2008).

8. Identify the location or suspected location of chemical releases at the site. Provide an estimate of the distance between these locations and the areas identified in Section III.

Chemical releases that may have occurred are associated with septic system leakage.

9. Identify the suspected contaminants of concern (COCs) at the site. If known, include the maximum contaminant levels. Please indicate the source of data cited (e.g., RFI, confirmatory sampling, etc.).

As documented in the RFI, detected constituents from soil samples collected include several metals. Additionally, samples were analyzed for VOCs, SVOCs, explosives, PCBs, petroleum hydrocarbons (gasoline, diesel and oil range), cyanide, and tritium; however all were non-detect in soil samples from the site (for 0 to 10 feet bgs, the zone of interest for ecological receptors).

10. Identify the media (e.g., soil (surface or subsurface), surface water, air, groundwater) which are known or suspected to contain COCs. _____
Surface and subsurface soil, and potentially, groundwater

11. Indicate the approximate depth to groundwater (in feet below ground surface [(bgs)].

A water-bearing zone was not encountered during soil boring advancement. Therefore, a groundwater investigation was not conducted at Building 1200.

12. Indicate the direction of groundwater flow (e.g., north, southeast, etc.)

According to Figure 2-3 of the RFI report, the direction of groundwater flow at Holloman AFB has been shown to be generally from northeast to southwest. A water-bearing zone was not encountered during soil boring advancement. Therefore, a groundwater investigation was not conducted at Building 1200.

III. HABITAT EVALUATION

III.A Wetland Habitats

Are any wetland[1] areas such as marshes or swamps on or adjacent to the site?

☐ Yes X No

If yes, indicate the wetland area on the attached site map and answer the following questions regarding the wetland area. If more than one wetland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wetland area. Distinguish between wetland areas by using names or other designations (such as location), and clearly identify each area on the site map. Also, obtain and attach a National Wetlands Inventory Map (or maps) to illustrate each wetland area.

Identify the sources of the observations and information (e.g., National Wetland Inventory, Federal or State Agency, USGS topographic maps) used to make the determination that wetland areas are or are not present.

The Integrated Natural Resource Management Plan for Holloman AFB (HAFB, 2011) and site observations.

If no wetland areas are present, proceed to Section III.B.

1Wetlands are defined in 40 CFR §232.2 as " Areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Examples of typical wetlands plants include: cattails, cordgrass, willows and cypress trees. National wetland inventory maps may be available at http:\\nwi.fws.gov. Additional information on wetland delineation criteria is also available from the Army Corps of Engineers.

Wetland Area Questions

☐ Onsite ☐ Offsite

Name or
Designation:_____

1. Indicate the approximate area of the wetland (acres or ft^2)_____

2. Identify the type(s) of vegetation present in the wetland.

   - ❑ Submergent (i.e., underwater) vegetation
   - ❑ Emergent (i.e., rooted in the water, but rising above it) vegetation
   - ❑ Floating vegetation
   - ❑ Scrub/shrub
   - ❑ Wooded
   - ❑ Other (Please describe):_____

3. Estimate the vegetation density of the wetland area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Is standing water present? ☐ Yes ☐ No

   If yes, is the water primarily: ☐ Fresh or ☐ Brackish
   Indicate the approximate area of the standing water (ft^2): _____
   Indicate the approximate depth of the standing water, if known (ft. or in.)_____

5. If known, indicate the source of the water in the wetland.

   - ❑ Stream/River/Creek/Lake/Pond
   - ❑ Flooding
   - ❑ Groundwater
   - ❑ Surface runoff

6. Is there a discharge from the facility to the wetland? ☐ Yes ☐ No

   If yes, please
   describe:_____
   _____
   _____
   _____
   _____

Wetland Area Questions (Continued)

7. Is there a discharge from the wetland? ☐ Yes ☐ No
   If yes, indicate the type of aquatic feature the wetland discharges into:

   - ❑ Surface stream/River (Name:_____)
   - ❑ Lake/Pond (Name:_____)
   - ❑ Groundwater
   - ❑ Not sure

8. Does the area show evidence of flooding? ☐ Yes ☐ No
   If yes, indicate which of the following are present (mark all that apply):

   - ❑ Standing water
   - ❑ Water-saturated soils
   - ❑ Water marks
   - ❑ Buttressing
   - ❑ Debris lines
   - ❑ Mud cracks
   - ❑ Other (Please describe):_____

9. Animals observed in the wetland area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:
   _____
   _____
   _____
   _____

III.B Aquatic Habitats

III.B.1 Non-Flowing Aquatic Features

Are any non-flowing aquatic features (such as ponds or lakes) located at or adjacent to the site?

☐ Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the non-flowing aquatic features. If more than one non-flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.B.2.

Non-Flowing Aquatic Feature Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Indicate the type of aquatic feature present:

   - ❑ Natural (e.g., pond or lake)
   - ❑ Man-made (e.g., impoundment, lagoon, canal, etc.)

2. Estimate the approximate size of the water body (in acres or sq. ft.)_____

3. If known, indicate the depth of the water body (in ft. or in.)._____

Non-Flowing Aquatic Feature Questions (Continued)

4. Indicate the general composition of the bottom substrate. Mark all sources that apply from the following list.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

☐ Other (please specify):_____

5. Indicate the source(s) of the water in the aquatic feature. Mark all sources that apply from the following list.

- ❑ River/Stream/Creek
- ❑ Groundwater
- ❑ Industrial Discharge
- ❑ Surface Runoff
- ❑ Other (please specify):_____

6. Is there a discharge from the facility to the aquatic feature? ☐ Yes ☐ No
   If yes, describe the origin of each discharge and its migration path:
   _____
   _____
   _____
   _____

7. Does the aquatic feature discharge to the surrounding environment? ☐ Yes ☐ No
   If yes, indicate the features from the following list into which the aquatic feature discharges, and indicate whether the discharge occurs onsite or offsite:

- ❑ River/Stream/Creek ☐ onsite ☐ offsite
- ❑ Groundwater ☐ onsite ☐ offsite
- ❑ Wetland ☐ onsite ☐ offsite
- ❑ Impoundment ☐ onsite ☐ offsite
- ❑ Other (please describe)_____

Non-Flowing Aquatic Feature Questions (Continued)

8. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Fish
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, turtles)
- ❑ Amphibians (e.g., frogs, salamanders)
- ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

Specify species, if known:

_____
_____
_____
_____

III.B.2 Flowing Aquatic Features

Are any flowing aquatic features (such as streams or rivers) located at or adjacent to the site?

☐ Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the flowing aquatic features. If more than one flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map

If no, proceed to Section III.C.

Flowing Aquatic Feature Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Indicate the type of flowing aquatic feature present.

   - ❑ River
   - ❑ Stream
   - ❑ Creek
   - ❑ Brook
   - ❑ Dry wash
   - ❑ Arroyo
   - ❑ Intermittent stream
   - ❑ Artificially created (ditch, etc.)
   - ❑ Other (specify)
   - ❑

2. Indicate the general composition of the bottom substrate.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

   ☐ Other (please specify):_____

3. Describe the condition of the bank (e.g., height, slope, extent of vegetative cover) of the aquatic feature.

   _____
   _____
   _____
   _____

4. Is there a discharge from the facility to the aquatic feature? ☐ Yes ☐ No
   If yes, describe the origin of each discharge and its migration path:

   _____
   _____
   _____
   _____

5. Indicate the discharge point of the water body. Specify name, if known.

   _____
   _____
   _____

Flowing Aquatic Feature Questions (Continued)

6. If the flowing aquatic feature is a dry wash or arroyo, answer the following questions.
   - ❑ Check here if feature is not a dry wash or arroyo

   If known, specify the average number of days in a year in which flowing water is present in the feature: _____

   Is standing water or mud present? Check all that apply.
   - ❑ Standing water
   - ❑ Mud
   - ❑ Neither standing water or mud

   Does the area show evidence of recent flow (e.g., flood debris clinging to vegetation)?
   - ❑ Yes
   - ❑ No
   - ❑ Not sure
7. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:

   _____
   _____
   _____
   _____

III.C Terrestrial Habitats

III.C.1 Wooded

Are any wooded areas on or adjacent to the site? ☐ Yes X No

If yes, indicate the wooded area on the attached site map and answer the following questions. If more than one wooded area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wooded area. Distinguish between wooded areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.2.

Wooded Area Questions

☐ On-site ☐ Off-site

Name or Designation:_____

1. Estimate the approximate size of the wooded area (in acres or sq. ft.)

2. Indicate the dominant type of vegetation in the wooded area.

   - ❑ Evergreen
   - ❑ Deciduous
   - ❑ Mixed

Dominant plant species, if known:_____

3. Estimate the vegetation density of the wooded area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the predominant size of the trees at the site. Use diameter at chest height.

   - ❑ 0-6 inches
   - ❑ 6-12 inches
   - ❑ >12 inches
   - ❑ No single size range is predominant

5. Animals observed in the wooded area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:_____

III.C.2 Shrub/Scrub

Are any shrub/scrub areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the shrub/scrub area on the attached site map and answer the following questions. If more than one shrub/scrub area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual shrub/scrub area. Distinguish between shrub/scrub areas, using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.3.

Shrub/Scrub Area Questions

X Onsite X Offsite

Name or Designation: Chihuahuan Desert Scrub (HAFB, 2011).

Note also: On-site areas are almost entirely gravel covered and void of habitat or vegetation with some apparent pockets of desert vegetation. Surrounding site habitat is characterized as Chihuahuan Desert. The habitat map (attached) shows that habitat surrounding the site is dominated by fourwing saltbush/alkali sacaton shrubland habitat, with lesser amounts of fourwing saltbush shrubland with honey mesquite, and fourwing saltbush gypsum dropseed shrubland.

1. Estimate the approximate size of the shrub/scrub area (in acres or sq. ft.). Surrounding HAFB are tens of thousands of acres of Chihuahuan Desert Scrub.

2. Indicate the dominant type of shrub/scrub vegetation present, if known.

According to information provided in Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011), the area around Building 1200 (OT-C537) is dominated by fourwing saltbush/alkali sacaton shrubland with lesser amounts of fourwing saltbush shrubland with honey mesquite, and fourwing saltbush gypsum dropseed shrubland.

3. Estimate the vegetation density of the shrub/scrub area.

- ❑ Dense (i.e., greater than 75% vegetation)
- X Moderate (i.e., 25% to 75% vegetation)
- ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the scrub/shrub vegetation.

- ❑ 0-2 feet
- X 2-5 feet
- ❑ >5 feet

5. Animals observed in the shrub/scrub area or suspected to be present based on indirect evidence or file material:
   - X Birds
   - X Mammals
   - X Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:
   The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna associated with the shrubland habitat potentially present in the area of Building 1200.

Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam kangaroo rat (*Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus auduboni*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.3 Grassland

Are any grassland areas on or adjacent to the site? ☐ Yes X No

If yes, indicate the grassland area on the attached site map and answer the following questions. If more than one grassland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual grassland area. Distinguish between grassland areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.4.

Grassland Area Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Estimate the approximate size of the grassland area (in acres or sq. ft.)._____

2. Indicate the dominant plant type, if known.
_____
_____
_____
_____

3. Estimate the vegetation density of the grassland area.

- ❑ Dense (i.e., greater than 75% vegetation)
- ❑ Moderate (i.e., 25% to 75% vegetation)
- ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the dominant plant type (in ft. or in.)_

5. Animals observed in the grassland area or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, lizards)
- ❑ Amphibians (e.g., toads, salamanders)

Specify species, if known:

III.C.4 Desert

Are any desert areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the desert area on the attached site map and answer the following questions. If more than one desert area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual desert area. Distinguish between desert areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.5.

Desert Area Questions

X Onsite X Offsite
Name or Designation: Chihuahuan Desert

1. Estimate the approximate size of the desert area (in acres or sq. ft.).
This site including HAFB is contained within tens of thousands of acres of the Chihuahuan Desert.

2. Describe the desert area (e.g., presence or absence of vegetation, vegetation types, presence/size of rocks, sand, etc.)
Many volumes of literature have been written on the natural biota of the Chihuahuan Desert. Detailed descriptions about the biotic communities within HAFB can be found in the HAFB Integrated Natural Resource Management Plan, (HAFB, 2011). Habitats directly associated with this Site include typical desert scrub communities.

3. Animals observed in the desert area or suspected to be present based on indirect evidence or file material:

X Birds
X Mammals
X Reptiles (e.g., snakes, lizards)
☐ Amphibians (e.g., toads, salamanders)

Specify species, if known:

The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna associated with the shrubland habitat potentially present in the area of Building 1200. Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam

kangaroo rat (*Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.5 Other

1. Are there any other terrestrial communities or habitats on or adjacent to the site which were not previously described?

☐ Yes X No

If yes, indicate the "other" area(s) on the attached site map and describe the area(s) below. Distinguish between onsite and offsite areas. If no, proceed to Section III.D.

III.D Sensitive Environments and Receptors

1. Do any other potentially sensitive environmental areas[2] exist adjacent to or within 0.5 miles of the site? If yes, list these areas and provide the source(s) of information used to identify sensitive areas. *Do not answer "no" without confirmation from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

The following is taken from the Integrated Natural Resources Management Plan for HAFB (HAFB,2011). HAFB and its Geographically Separated Units (GSUs) have high biodiversity, including many sensitive species. No threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The White Sands pupfish is not Federally-listed nor has critical habitat been designated because of the multi-agency cooperative agreement to manage the species to support viable populations through habitat management and research.

Most of the sensitive species are birds that are either associated with grassland habitats on main base or with wetland habitats, primarily in the Lake Holloman Public Access Area wetlands complex south of the Cantonment. Sensitive grassland and desert species at HAFB that are discussed in further detail in the management plan include:

- White Sands pupfish

2 Areas that provide unique and often protected habitat for wildlife species. These areas are typically used during critical life stages such as breeding, hatching, rearing of young and overwintering. Refer to **Table 1** at the end of this document for examples of sensitive environments.

- Acarospora clauzadeana lichen
- Grassland neotropical migratory birds
- Western burrowing owl
- Aplomado falcon
- Grassland raptors
- Bats
- Texas horned lizard and other reptiles

2. Are any areas on or near (i.e., within 0.5 miles) the site which are owned or used by local tribes? If yes, describe. *Contact the Tribal Liason in the Office of the Secretary (505)827-2855 to obtain this information.*

No

3. Does the site serve or potentially serve as a habitat, foraging area, or refuge by rare, threatened, endangered, candidate and/or proposed species (plants or animals), or any otherwise protected species? If yes, identify species. *This information should be obtained from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

No, based on information in the Integrated Natural Resources Management Plan, no threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The plan establishes protocols for management of sensitive desert and grassland habitats.

4. Is the site potentially used as a breeding, roosting or feeding area by migratory bird species? If yes, identify which species.

Likely not. The site has very limited viable habitat due to the disturbed nature of the site, but areas surrounding the site could potentially provide habitat for these purposes.

5. Is the site used by any ecologically[3], recreationally, or commercially important species? If yes, explain.

No

3 Ecologically important species include populations of species which provide a critical (i.e., not replaceable) food resource for higher organisms and whose function as such would not be replaced by more tolerant species; or perform a critical ecological function (such as organic matter decomposition) and whose functions will not be replaced by other species. Ecologically important species include pest and opportunistic species that populate an area if they serve as a food source for other species, but do not include domesticated animals (e.g., pets and livestock) or plants/animals whose existence is maintained by continuous human interventions (e.g., fish hatcheries, agricultural crops, etc.,)

IV. EXPOSURE PATHWAY EVALUATION

1. Do existing data provide sufficient information on the nature, rate, and extent of contamination at the site?

   X Yes
   ❑ No
   ❑ Uncertain

   Please provide an explanation for your answer: Sample results have sufficiently characterized the site.

2. Do existing data provide sufficient information on the nature, rate, and extent of contamination in offsite affected areas?

   □ Yes
   ❑ No
   ❑ Uncertain
   X No offsite contamination

   Please provide an explanation for your answer:
   No offsite contamination is expected, and no off-site soil or groundwater samples were collected.

3. Do existing data address potential migration pathways of contaminants at the site?

   X Yes
   ❑ No
   ❑ Uncertain

   Please provide an explanation for your answer

   While potential migration from impacted soils to groundwater might occur, no water bearing zones were encountered beneath the site.

4. Do existing data address potential migration pathways of contaminants in offsite affected areas?

   □ Yes
   ❑ No
   ❑ Uncertain
   X No offsite contamination

   Please provide an explanation for your answer:

   See response to No. 3 presented previously. Also, no off-site soil contamination is expected.

5. Are there visible indications of stressed habitats or receptors on or near (i.e., within 0.5 miles) the site that may be the result of a chemical release? If yes, explain. Attach photographs if available.

No.

6. Is the location of the contamination such that receptors might be reasonably expected to come into contact with it? For soil, this means contamination in the soil 0 to 5 feet below ground surface (bgs). If yes, explain.

Yes. Some soil samples were collected in site areas where receptors might contact detected constituents.

7. Are receptors located in or using habitats where chemicals exist in air, soil, sediment or surface water? If yes, explain.

Yes. See response to No. 6 presented above.

8. Could chemicals reach receptors via groundwater? Can chemicals leach or dissolve to groundwater? Are chemicals mobile in groundwater? Does groundwater discharge into receptor habitats? If yes, explain.

No. No water bearing zones were encountered beneath the site.

9. Could chemicals reach receptors through runoff or erosion? Answer the following questions:

What is the approximate distance from the contaminated area to the nearest watercourse or arroyo?

- ❑ 0 feet (i.e., contamination has reached a watercourse or arroyo)
- ❑ 1-10 feet
- ❑ 11-20 feet
- ❑ 21-50 feet
- ❑ 51-100 feet
- ❑ 101-200 feet
- ❑ > 200 feet
- ❑ > 500 feet
- X > 1000 feet

What is the slope of the ground in the contaminated area?

- X 0-10%
- ❑ 10-30%
- ❑ > 30%

What is the approximate amount of ground and canopy vegetative cover in the contaminated area?

- ❑ < 25%
- X 25-75%
- ❑ > 75%

Is there visible evidence of erosion (e.g., a rill or gully) in or near the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

Do any structures, pavement, or natural drainage features direct run-on flow (i.e., surface flows originating upstream or uphill from the area of concern) into the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

10. Could chemicals reach receptors through the dispersion of contaminants in air (e.g., volatilization, vapors, fugitive dust)? If yes, explain.

Yes. However, detected concentrations of constituents in soil do not generally exceeding relevant background values or ecological screening criteria (see screening assessment in main text).

11. Could chemicals reach receptors through migration of non-aqueous phase liquids (NAPLs)? Is a NAPL present at the site that might be migrating towards receptors or habitats? Could NAPL discharge contact receptors or their habitat?

No NAPLs are present at the site.

12. Could receptors be impacted by external irradiation at the site? Are gamma emitting radionuclides present at the site? Is the radionuclide contamination buried or at the surface?

No. No radionuclide contamination is expected to be present at the site.

PHOTOGRAPHIC DOCUMENTATION

During the site visit(s), photographs should be taken to document the current conditions at the site and to support the information entered in the checklist. For example, photographs may be used to document the following:

- The nature, quality, and distribution of vegetation at the site
- Receptors or evidence of receptors
- Potentially important ecological features, such as ponds and drainage ditches
- Potential exposure pathways
- Any evidence of contamination or impact

SUMMARY OF OBSERVATIONS AND SITE SETTING

Include information on significant source areas and migration pathways that are likely to constitute complete exposure pathways.

Although potentially complete exposure pathways exist (e.g. direct contact with surface soil), significant source areas are not present, as results of the screening assessment (see main text) indicate that detected concentrations of constituents in soil do not generally exceeding relevant ecological screening criteria.

Checklist Completed by Mark Hardner

Affiliation CB&I Federal Services, LLC.

Author Assisted by William Stanhope, CB&I Federal Services, LLC.

Date July 26, 2013

Building 1200 Location

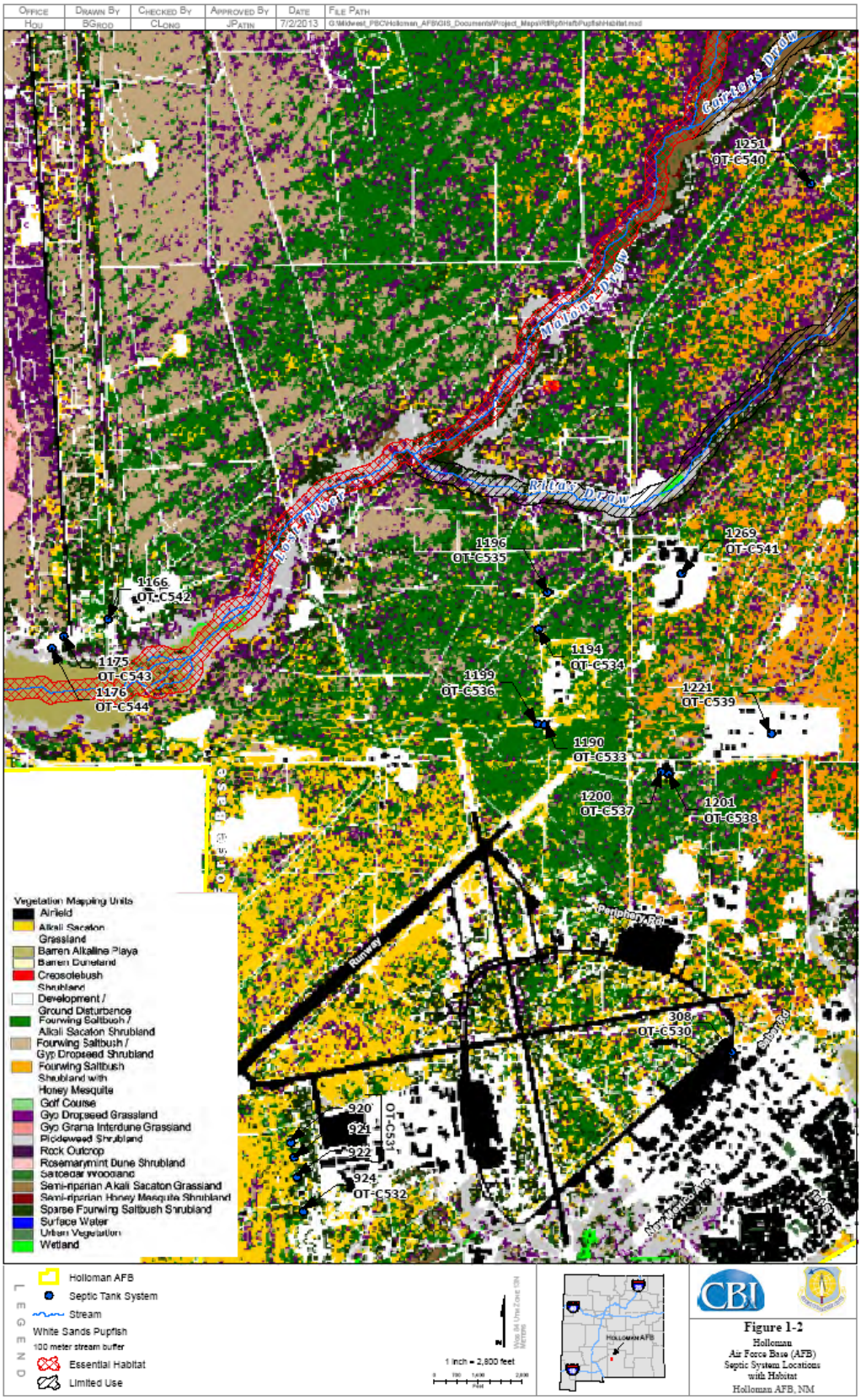

Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
with Habitat
Holloman AFB, NM

REFERENCES

Holloman Air Force Base (HAFB), 2011. *Integrated Natural Resource Management Plan*, February.

Holloman Air Force Base (HAFB), 2007. *Holloman Air Force Base Septic Tanks*, April.

New Mexico Environment Department (NMED), 2012. *Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document*, Hazardous Waste Bureau and Ground Water Quality Bureau, February, Table A-1 updated June 2012.

North Wind, Inc., 2008. *Technical Memorandum Summarizing Decommissioning Work Conducted on Inactive Septic Tanks at Holloman AFB*, March.

TABLE 1
EXAMPLES OF SENSITIVE ENVIRONMENTS

National Parks and National Monuments

Designated or Administratively Proposed Federal Wilderness Areas

National Preserves

National or State Wildlife Refuges

National Lakeshore Recreational Areas

Federal land designated for protection of natural ecosystems

State land designated for wildlife or game management

State designated Natural Areas

Federal or state designated Scenic or Wild River

All areas that provide or could potentially provide critical habitat[1] for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern

All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes

All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)

---

1 Critical habitats are defined by the Endangered Species Act (50 CFR §424.02(d)) as:

> 1) Specific areas within the geographical area currently occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (ii) that may require special management considerations or protection, and 2) Specific areas outside the geographical area occupied by a species at the time it is listed upon a determination by the Secretary [of Interior] that such areas are essential for the conservation of the species.

All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)

All areas that provide or could potentially provide habitat for song birds as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-13)

All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)

All areas that provide or could potentially provide habitat for horned toads and Bullfrogs as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, resp.)

All perennial waters (e.g., rivers, lakes, playas, sloughs, ponds, etc)

All ephemeral drainage (e.g., arroyos, puddles/pools, intermittent streams, etc) that provide significant wildlife habitat or that could potentially transport contaminants off site to areas that provide wildlife habitat

All riparian habitats

All perennial and ephemeral wetlands (not limited to jurisdictional wetlands)

All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle.

ATTACHMENT B

ECOLOGICAL SITE EXCLUSION CRITERIA CHECKLIST AND DECISION TREE

1. NEW MEXICO ECOLOGICAL EXCLUSION CRITERIA CHECKLIST

The following questions are designed to be used in conjunction with the Ecological Exclusion Criteria Decision Tree (Figure 1). After answering each question, refer to the Decision Tree to determine the appropriate next step. In some cases, questions will be omitted as the user is directed to another section as indicated by the flow diagram in the Decision Tree. For example, if the user answers "yes" to Question 1 of Section I, he or she is directed to proceed to Section II.

I. Habitat

In the following questions, "affected property" refers to all property on which a release has occurred or is believed to have occurred, including off-site areas where contamination may have occurred or migrated.

1. Are any of the below-listed sensitive environments at, adjacent to, or in the locality1 of the affected property?

   - National Park or National Monument
   - Designated or administratively proposed Federal Wilderness Area
   - National Preserve
   - National or State Wildlife Refuge
   - Federal or State land designated for wildlife or game management
   - State designated Natural Areas
   - All areas that are owned or used by local tribes
   - All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle
   - All areas that provide or could potentially provide habitat for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern
   - All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes
   - All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)
   - All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)
   - All areas that provide or could potentially provide habitat for song birds as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game

1 *Locality* of the site refers to any area where an ecological receptor is likely to contact site-related chemicals. The locality of the site considers the likelihood of contamination migrating over time and places the site in the context of its general surrounding. Therefore, the locality is typically larger than the site and the areas adjacent to the site.

and Fish, 17-2-13)

- All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)
- All areas that provide or could potentially provide habitat for horned toads and bullfrogs as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, respectively)

2. Does the affected property contain land areas which were not listed in Question 1, but could be considered viable ecological habitat? The following are examples (but not a complete listing) of viable ecological habitats:

- Wooded areas
- Shrub/scrub vegetated areas
- Open fields (prairie)
- Other grassy areas
- Desert areas
- Any other areas which support wildlife and/or vegetation, excluding areas which support only opportunistic species (such as house mice, Norway rats, pigeons, etc.) that do not serve as prey to species in adjacent habitats.

The following features are <u>not</u> considered ecologically viable:

- Pavement
- Buildings
- Paved areas of roadways
- Paved/concrete equipment storage pads
- Paved manufacturing or process areas
- Other non-natural surface cover or structure

3. Does the affected property contain any perennial or ephemeral aquatic features which were not listed in Question 1?

II. Receptors

1. Is any part of the affected property used for habitat, foraging area, or refuge by any rare, threatened, or endangered species (plant *or* animal), or otherwise protected species (e.g., raptors, migratory birds)?

2. Is any part of the affected property used for habitat, foraging area, or refuge by any species used as a recreational (e.g., game animals) and/or commercial resource?

3. Is any part of the affected property used for habitat, foraging area, or refuge by any plant or animal species? This includes plants considered "weeds" and opportunistic insect and animal species (such as cockroaches and rats) if they are used as a food source for other species in the area.

III. Exposure Pathways

1. Could receptors be impacted by contaminants via direct contact?

   Is a receptor located in or using an area where it could contact contaminated air, soil[3], or surface water?

For Questions 2 and 3, note that one must answer "yes" to all three bullets in order to be directed to the "exclusion denied" box of the decision tree. This is because answering "no" to one of the questions in the bullet list indicates that a complete exposure pathway is not present. For example, in Question 2, if the chemical cannot leach or dissolve to groundwater (bullet 1), there is no chance of ecological receptors being exposed to the chemical through contact with contaminated groundwater. Similarly, the responses to the questions in Question 4 determine whether a complete pathway exists for exposure to NAPL.

2. Could receptors contact contaminants via groundwater?
   - Can the chemical leach or dissolve to groundwater[4]?
   - Can groundwater mobilize the chemical?
   - Could (does) contaminated groundwater discharge into known or potential receptor habitats?

3. Could receptors contact contaminants via runoff (i.e., surface water and/or suspended sediment) or erosion by water or wind?
   - Are chemicals present in surface soils?
   - Can the chemical be leached from or eroded with surface soils?
   - Is there a receptor habitat located downgradient of the leached/eroded surface soil?

---

3 For soil, this means contamination less than 5 feet below ground surface (bgs).

4 Information on the environmental fate of specific chemicals can be found on the Internet at *http://www.epa.gov/opptintr/chemfact/* or at a local library in published copies of the *Hazardous Substances Data Bank*.

4. Could receptors contact contaminants via migration of non-aqueous phase liquids (NAPL)?

- Is NAPL present at the site?
- Is NAPL migrating toward potential receptors or habitats?
- Could NAPL discharge impact receptors or habitats?

Figure 1 -Ecological Exclusion Criteria Decision Tree

(Refer to corresponding checklist for the full text of each question)

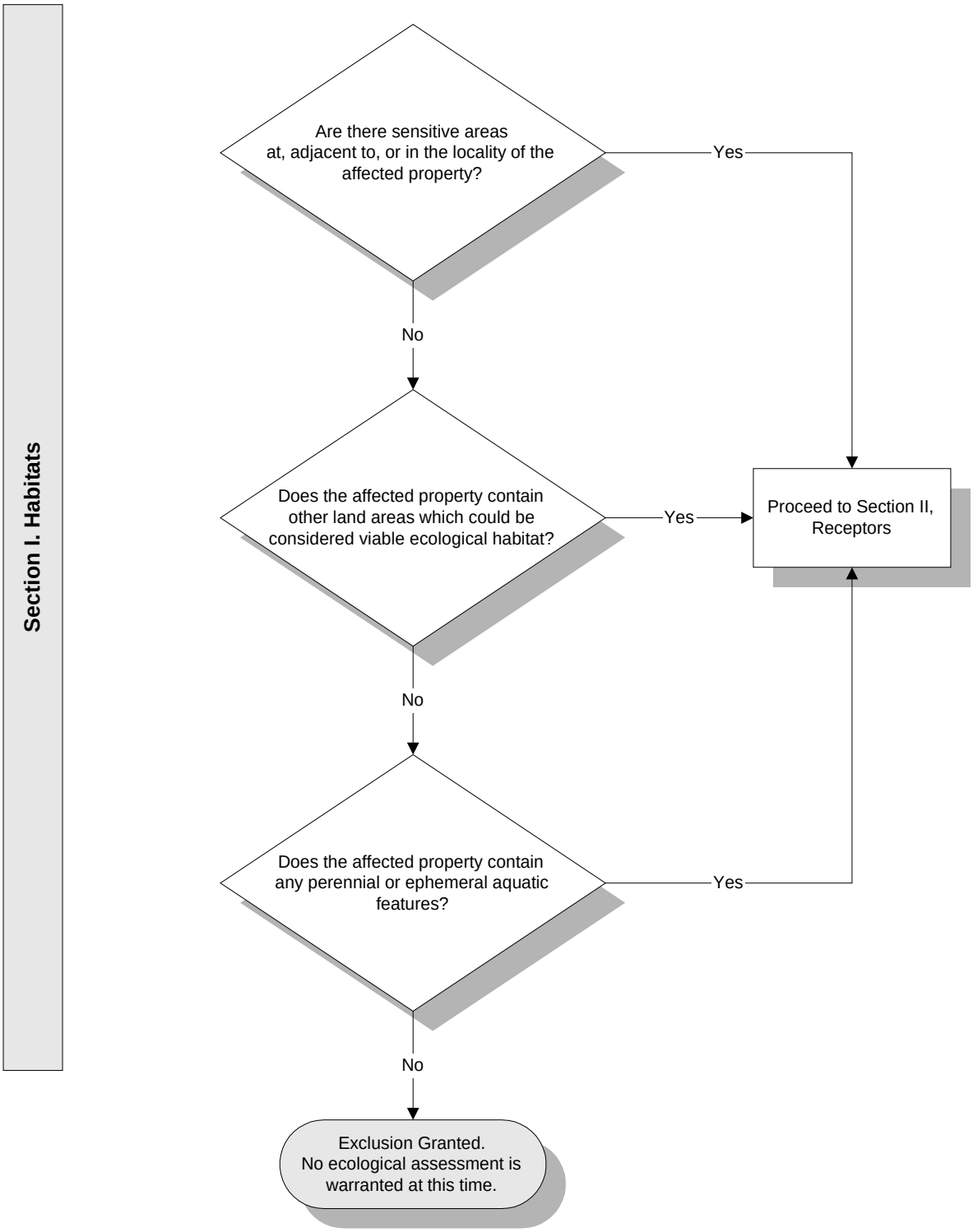

Figure 1 - Exclusion Criteria Decision Tree (continued)

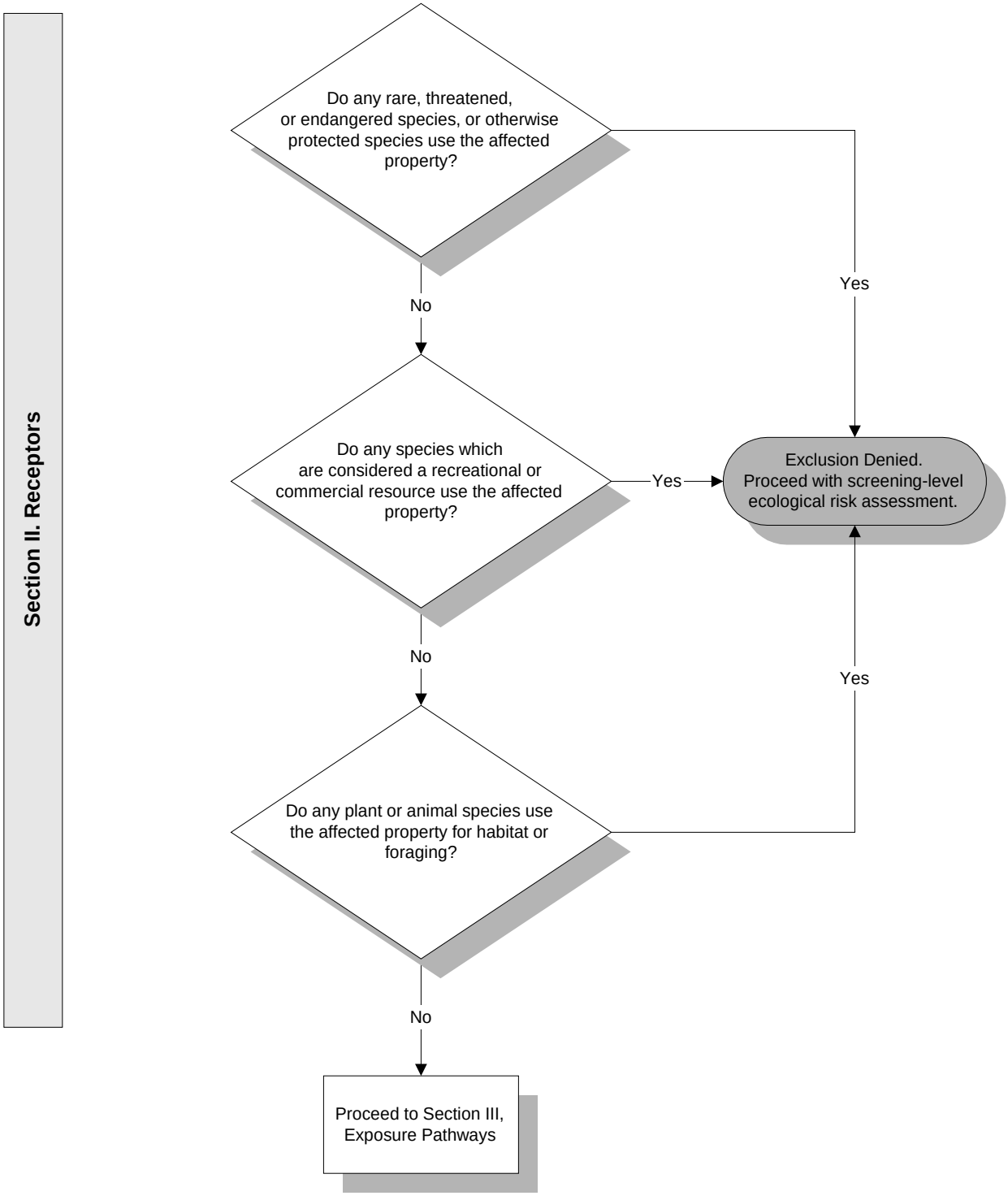

Figure 1 - Exclusion Criteria Decision Tree (continued)

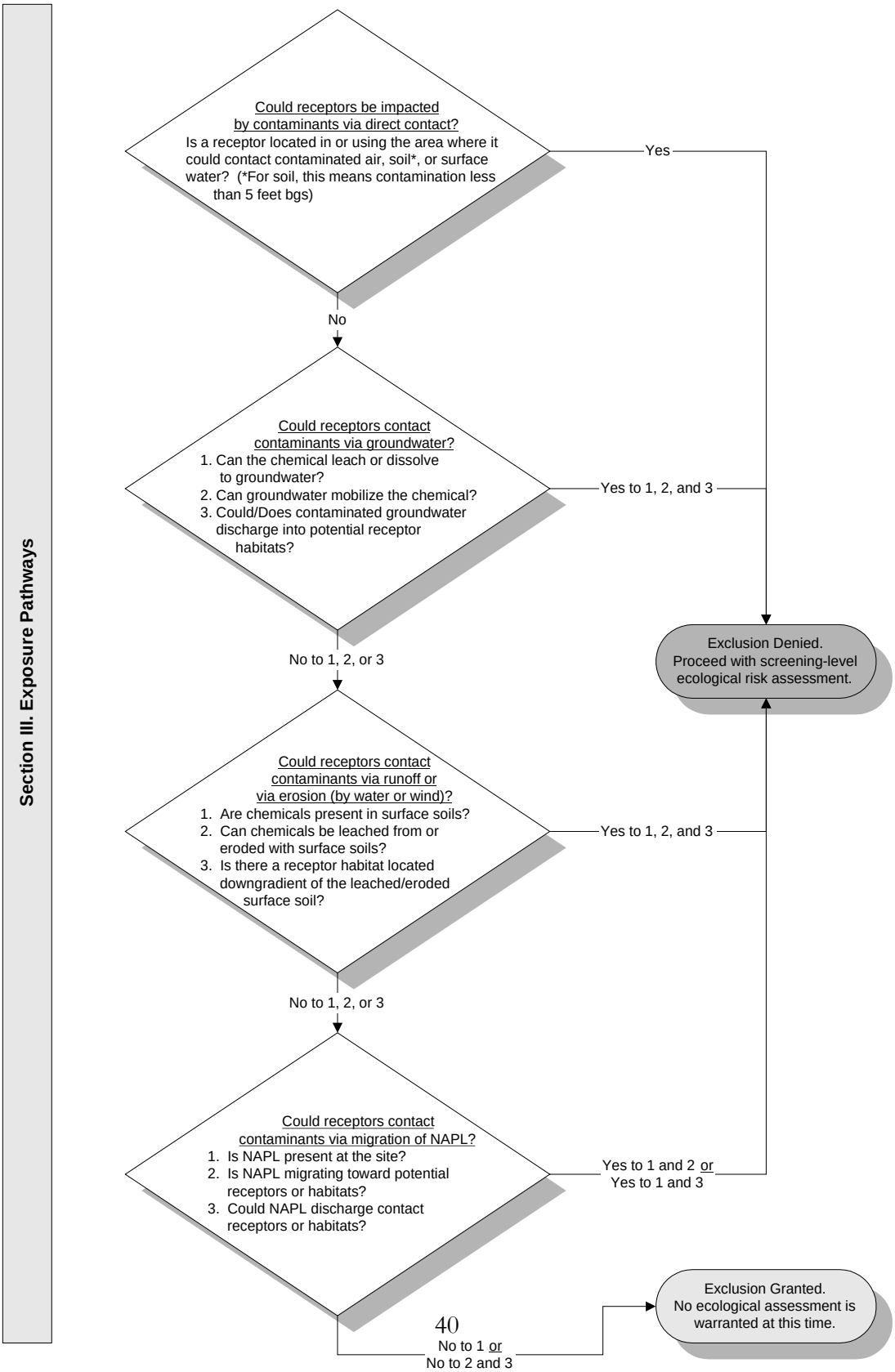

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1200 (OT-C537) RFI Report
Holloman Air Force Base, New Mexico

Analyte		Sample Number	OTC537-IS-0001-071612		OTC537-IS-0003-071612		OTC537-IS-0005-071612	
		Sample Date	7/16/2012		7/16/2012		7/16/2012	
		Location	OTC537-Station 1 Influent to tank		OTC537-Station 2 Septic tank / earthen pit		OTC537-Station 3 south of tank / earthen pit	
		Depth (ft bgs)	3 - 5		7 - 9		3 - 5	
	Background Values - Soil (mg/kg)[a]	**LANL (2012) ESLs (mg/kg)[b]**	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	**81.5**		**88.1**		**83.7**	
METALS (mg/kg)								
ALUMINUM	13722	pH Dependent	1450		4970	J	1010	
ARSENIC	3.7	6.8 / 68	1.1	J	1.3	J	1.1	U
BARIUM	169	110 / 260	26.7	J	39.6	J	17.7	J
CALCIUM	317332	NSV	254000		198000		297000	
CHROMIUM	25	28 / 280	1.4	J	5.4	J	0.7	J
COBALT	7.7	13 / 130	1.1	J	1.8	J	0.59	J
COPPER	13	15 / 46	1.4	J	2.9	J	1.2	J
IRON	23049	NSV	1110		4780	J	915	
LEAD	10.9	14 / 28	0.93	U	2.8	J	2.6	J
MAGNESIUM	16991	NSV	3660		2560	J	788	J
MANGANESE	393	220 / 1,100	21.6		89.2	J	35.8	
NICKEL	17.4	9.7 / 19	1.8	J	4.2	J	1.5	J
POTASSIUM	5077	NSV	406	J	1110	J	282	J
SODIUM	5196	NSV	1870	J	610	U	600	U
VANADIUM	42.6	0.025 / 0.25	7.4	J	9.6	J	2.8	J
ZINC	54.6	48 / 480	4.6	U	12.9		2.7	U

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1200 (OT-C537) RFI Report
Holloman Air Force Base, New Mexico

LANL (2012) ESL values represented as: No-Effect ESL / Low-Effect ESL (e.g., 6.8 / 68 for arsenic)

LANL (2012) ESL Exceeded

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] Los Alamos National Laboratory (LANL), 2012, ECORISK Database, LA-UR-12-24548, Release 3.1, October.

EPA = U.S. Environmental Protection Agency
FD = field duplicate
ft bgs = feet below ground surface
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Final

RCRA Facility Investigation Report
Group 1 – Building 1201 (OT-C538)
Holloman Air Force Base, New Mexico

Prepared for U.S. Air Force Civil Engineer Center
2261 Hughes Ave., Suite 155
Lackland Air Force Base, Texas 78236-9861

Prepared by Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

Contract No. FA8903-09-D-8580
Task Order No. 0013
Project No. 144106
Revision 0
October 2013

Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)

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Acronyms and Abbreviations

AFB	Air Force Base
bgs	below ground surface
COPC	constituent of potential concern
DPT	direct push technology
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
ft	foot/feet
GPR	ground-penetrating radar
GRO	gasoline range organics
HI	hazard index
IDW	investigation-derived waste
LANL	Los Alamos National Laboratory
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MDL	method detection limit
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
ORO	oil range organics
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RSL	Regional Screening Level
Shaw	Shaw Environmental & Infrastructure, Inc. (a CB&I Company)
SLERA	screening-level ecological risk assessment
SSL	soil screening level
SVOC	semivolatile organic compound
TAL	target analyte list
TDS	total dissolved solids
TPH	total petroleum hydrocarbons
VCM	Voluntary Corrective Measure
VOC	volatile organic compound
WQS	water quality standards

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1.0 INTRODUCTION

Shaw Environmental & Infrastructure. Inc. (Shaw), a CB&I company, has prepared this Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for the Air Force Civil Engineer Center (formerly the Air Force Center for Engineering and the Environment) under Contract No. FA8903-09-D-8580, Task Order No. 0013, Modification 01. Results presented in this report are from the investigation and corrective measures of the abandoned septic tank located at Building 1201 (OT-C538) at Holloman Air Force Base (AFB), New Mexico, which was one of the fifteen Group 1 septic tank sites under the Midwestern Region Performance-Based Remediation Contract. This RFI Report has been prepared pursuant to the requirements of the Holloman AFB Hazardous Waste Facility RCRA Permit No. NM6572124422 (the Permit) (New Mexico Environment Department [NMED], 2004). The purpose of this RFI was to delineate potential contamination that may have been released to the environment from the Building 1201 septic tank system.

Holloman AFB is situated in south-central New Mexico in the northwest central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). The 15 Group 1 former septic tank sites are located throughout Holloman AFB (Figure 1-2). Each former septic tank is associated with a specific building and is named in reference to the building, along with a numerical identification. As such, the 15 Group 1 septic tank systems are the following: OT-C530 (Building 308), OT-C531 (Buildings 920, 921, and 922), OT-C532 (Building 924), OT-C533 (Building 1190), OT-C534 (Building 1194), OT-C535 (Building 1196), OT-C536 (Building 1199), OT-C537 (Building 1200), OT-C538 (Building 1201), OT-C539 (Building 1221), OT-C540 (Building 1251), OT-C541 (Building 1269), OT-C542 (Building 1166), OT-C543 (Building 1175), and OT-C544 (Building 1176). This report presents a summary of the RFI work conducted at inactive septic tank OT-C533 at Building 1201.

Building 1201, historically known as the Aerospace Medical Laboratory, was constructed in 1951 as one of several laboratories used for aeromedical research, and is associated with the Primate Research Facility. The *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) report in Appendix A indicates that the building contained an autopsy/mortuary room, photography room, and animal cages. During a site inspection conducted in 2007, it was discovered that the bathroom drain was separate from the work area drain and that all floor drains had been plugged. The septic tank (which the North Wind report termed an old treatment plant) was abandoned in place in January 2008 by opening the tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill (North Wind, Inc., 2008, also included in Appendix A).

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1.1 Purpose of the Investigation

Investigative activities were undertaken at Holloman AFB to determine the nature and extent of contamination, and propose recommendations for either closure or additional corrective action, if necessary, at 15 inactive, abandoned, or removed septic tank systems, following the general guidance for closing septic systems found in 20.7.3.307 New Mexico Administrative Code (NMAC) Standards – Abandoned Sewers and On-Site Liquid Waste Systems.

Project quality objectives for each septic tank site consisted of the following:

- Gather and review all site historical information
- Identify septic tank components and historical uses
- Remove septic tank contents and contaminated soil (where necessary), and abandon the tank (where necessary)
- Determine the nature and extent of residual constituents of concern at each site, including potential pathways to groundwater
- Evaluate the risk at each site
- Develop conclusions and recommendations for each site.

This RFI Report presents the data collected to meet these project quality objectives at the Building 1201 abandoned septic tank.

1.2 Scope of Activities

This RFI Report describes all activities associated with the septic tank investigation and remediation at Building 1201, including soil and groundwater sampling, sample analysis, as-built pipe mapping, and site boundary survey. All work was performed in accordance with the *Basewide Septic Tank Solid Waste Management Unit RFI Work Plan* (USACE, 2010) and the *Quality Program Plan* (Shaw, 2012a). The *Quality Program Plan* (Shaw, 2012a) contains the Site Safety and Health Plan; the Uniform Federal Policy–Sampling and Analysis Plan/Quality Assurance Project Plan; and the Construction Quality Plan, which defines the methodology and practices that were used to control construction work during the performance of the RFI.

1.3 Regulatory Setting

The Permit (NMED, 2004) established the general and specific standards and activities for managing hazardous waste pursuant to Subtitle C of RCRA, the New Mexico Hazardous

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Waste Act, and the New Mexico Hazardous Waste Management Regulations. The Permit also set forth requirements for investigation, notification, corrective action, and reporting for the storage, management, and releases of hazardous wastes.

The 15 septic systems were either abandoned, inactive, or previously removed. as indicated in *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) report (Appendix A), and were not listed in the Permit (NMED, 2004). The Holloman AFB *RFI Work Plan* (USACE, 2010) was approved by NMED in a letter dated January 13, 2010 (NMED, 2010). The NMED-approved *RFI Work Plan* (USACE, 2010) contained investigation activities only; therefore, Shaw submitted the Group 1 *Final Voluntary Corrective Measure Request – Septic Tanks Sites* (Shaw, 2012b) to include remediation and closure tasks that addressed septic system abandonment using 20.7.3.307 NMAC (Abandoned Sewers and On-Site Liquid Waste Systems). NMED has primary regulatory responsibility for the septic system sites; therefore corrective action must be performed under Title 20 NMAC.

The septic tank investigation was based on action/cleanup levels stipulated in Appendix 4-F of the Permit to be protective of human health and the environment. Permit Appendix 4-F specifies that soil contaminant concentrations be compared with the NMED residential soil screening levels (SSL), as presented in the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a), or the U.S. Environmental Protection Agency (EPA) residential Regional Screening Levels (RSLs) as presented in the *U.S. Environmental Protection Agency (EPA) Regions 3, 6, and 9 Regional Screening Levels for Chemical Contaminants at Superfund Sites* (EPA, 2012a), if no NMED SSL has been established. Holloman AFB also has NMED-approved background concentrations for metals in soil (NMED, 2012b).

Regarding groundwater, the Permit specifies that the more stringent of either the New Mexico Water Quality Control Commission (NMWQCC) water quality standards (WQS) (20.6.2 NMAC), or the EPA drinking water maximum contaminant levels, be used for comparison with measured sample concentrations (EPA, 2012b).

1.4 RFI Report Organization

This RFI Report is organized into the following sections:

- **Section 1.0, Introduction**: identifies the objectives and purpose of this report.
- **Section 2.0, Environmental Setting**: provides pertinent descriptions of history, location, physiography, topography, surface water, hydrology, regional geology, soil types, regional hydrogeology, climate, current and future land use, and current and future water use for Holloman AFB.

- **Section 3.0, Source Characterization**: describes the data collection techniques and locations, as well as analytical methods.

- **Section 4.0, Investigation Results and Evaluation**: presents the soil and groundwater analytical results, summarizes the geochemical evaluation, and provides the results of the human health risk and ecological evaluations.

- **Section 5.0, Data Quality Assurance and Data Quality Control Review**: summarizes the analytical data validation results.

- **Section 6.0, Conclusions and Recommendations**: presents the conclusions and recommendations of this RFI report.

- **Section 7.0, References**: lists the references cited in this report.

In addition to the figures and tables listed in the table of contents, the following appendices are included in this report:

- **Appendix A** – Historical Records
- **Appendix B** – Photographic Log
- **Appendix C** – Geophysical Report
- **Appendix D** – Sample Collection Logs
- **Appendix E** – Boring Logs
- **Appendix F** – Well Construction Diagrams
- **Appendix G** – Well Purge Records
- **Appendix H** – Site Survey Data
- **Appendix I** – Laboratory Analytical Data and Data Validation Checklists
- **Appendix J** – Waste Manifests
- **Appendix K** – Geochemical Evaluation
- **Appendix L** – Risk Evaluation Calculations
- **Appendix M** – Ecological Evaluation.

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2.0 ENVIRONMENTAL SETTING

This section provides background information for Holloman AFB including physical setting, history, topography, climate, soils, geology, hydrology, and land and water use.

2.1 Physical Setting

Holloman AFB is situated in south-central New Mexico, in the northwest-central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). Holloman AFB has a population of 6,000, and occupies 59,639 acres in the northeast quarter of Section 1, Township 17 South, Range 8 East. The White Sands Missile Range testing facilities occupy additional land extending northward from the base. Privately- and publicly-owned lands border the remainder of Holloman AFB. The major highway servicing Holloman AFB is Highway 70, which runs southwest from the town of Alamogordo New Mexico, and separates Holloman AFB from publicly owned lands to the south. Alamogordo, New Mexico, which has a population of 30,401 according to the 2010 U.S. Census, is located approximately 7 miles east of the base.

2.2 Holloman Air Force Base History

Holloman AFB was first established in 1942 as Alamogordo Army Air Field. From 1942 through 1945, Alamogordo Army Air Field served as the training grounds for over 20 different flight groups, flying primarily B-17s, B-24s, and B-29s. After World War II, most operations had ceased at the base. In 1947, Air Material Command announced the air field would be its primary site for the testing and development of unmanned aircraft, guided missiles, and other research programs. On January 13, 1948, the Alamogordo installation was renamed in honor of the late Colonel George V. Holloman, a pioneer in guided missile research. In 1968, the 49th Tactical Fighter Wing arrived at Holloman AFB, and has remained since. Today, Holloman AFB also serves as the training center for the German Air Force's Tactical Training Center.

2.3 Physiography and Topography

Holloman AFB is located within the Sacramento Mountains physiographic province on the western edge of the Sacramento Mountains. The base is approximately 59,600 acres in area, and is located at a mean elevation of 4,093 feet (ft) above mean sea level. The region is characterized by high tablelands with rolling summit plains; cuesta-formed mountains dipping eastward; and west-facing escarpments, with the wide bracketed basin forming the basin and range complex. Holloman AFB is located in the Tularosa Basin, which is part of the Central Closed Basins. The bordering mountains rise abruptly to altitudes of 7,000 to 12,000 ft above mean sea level. The San Andres Mountains bound the basin to the west

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(approximately 30 miles) with the Sacramento Mountains approximately 10 miles to the east (Figure 2-1). At its widest, the basin is approximately 60 miles east to west, and stretches approximately 150 miles north to south.

2.4 Climate

As a whole, New Mexico has a mild, arid to semiarid continental climate characterized by light precipitation totals, abundant sunshine, relatively low humidity, and relatively large annual and diurnal temperature ranges (Western Regional Climate Center, 2013). The climate of the Central Closed Basins varies with elevation. The base is located in the low areas and is characterized by warm temperatures and dry air. Daytime temperatures often exceed 100 degrees Fahrenheit in the summer months, and are in the middle 50s degrees Fahrenheit in the winter. A preponderance of clear skies and relatively low humidity permits rapid nighttime cooling resulting in average diurnal temperature ranges of 25 to 35 degrees Fahrenheit. Potential evapotranspiration, at 67 inches per year, significantly exceeds annual precipitation, usually less than 15 inches. Arid conditions resulting from very low rainfall amounts, coupled with the topographically induced wind patterns combining with the sparse vegetation, tend to cause localized “dust devils.” The annual rainfall for Alamogordo, New Mexico is 12 inches per year. Much of the precipitation falls during the midsummer monsoonal period (July and August) as brief, yet frequent, intense thunderstorms culminating in 30 to 40 percent of the total annual rainfall.

2.5 Regional Geology and Soils

2.5.1 Geology

The sedimentary rocks that make up the adjacent mountain ranges are between 250 and 500 million years old (New Mexico Bureau of Geology and Mineral Resources, 2012). During the period when the area was submerged beneath the shallow intracontinental sea, the layers of limestone, shale, gypsum, and sandstone were formed. In time, these layers were pushed upward through various tectonic forces forming a large bulge on the surface. Approximately 10 million years ago, the center began to subside resulting in a vertical drop of thousands of feet, leaving the edges still standing (the present-day Sacramento and San Andres mountain ranges). In the millions of years following, rainfall, snowmelt, and wind eroded the mountain sediments depositing them in the valley (i.e., Tularosa Basin). Water carrying eroded limestone, dolomite, gravel, and other materials continue to flow into the basin.

As the Tularosa Basin is a bolson, which is a basin with no surface drainage outlet, sediments carried by surface water into a closed basin are bolson deposits. The overlying alluvium generally consists of unconsolidated gravels, sands, and clays. Soils in the basin are derived from the adjacent ranges as erosional deposits of limestone, dolomite, and gypsum. A fining

sequence from the ranges towards the basin's center characterizes the area with the near-surface soils as alluvial, eolian, and lacustrine deposits. The alluvial fan deposits are laterally discontinuous units of interbedded sand, silt, and clay while the eolian deposits consist primarily of gypsum sands. The eolian and alluvial deposits are usually indistinguishable due to the reworking of the alluvial sediment by eolian processes. The playa, or lacustrine deposits, consist of clay containing gypsum and are contiguous with the alluvial fan and eolian deposits throughout the base. Stiff caliche layers, varying in thickness, have been identified at different areas of the base.

2.5.2 Soils

The U.S. Natural Resources Conservation Service (formerly the Soil Conservation Service) has identified two soil associations in the vicinity of Holloman AFB: (1) the Holloman-Gypsum Land-Yesum Complex, and (2) the Mead silty clay loam (Figure 2-2) (U.S. Department of Agriculture, 1981). The permeability of these horizons ranges from 4×10^{-4} to 1×10^{-3} centimeters per second.

The Holloman-Gypsum Land-Yesum Complex, 0 to 5 percent sloped soil, consists of larger areas of shallow and deep, well-drained soils and areas of exposed gypsum. The Holloman soil makes up approximately 35 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 13 inches of the substratum is pink, very fine sandy loam that is very high in gypsum. Below that, the substratum is white gypsum to a depth of more than 60 inches. This soil is calcareous and mildly alkaline to moderately alkaline. Permeability is moderate. Available water capacity is very low.

Gypsum Land makes up approximately 30 percent of the Holloman-Gypsum Land-Yesum Complex (0 to 5 percent slopes). Typically, less than 1 inch of very fine sandy loam overlies soft to hard, white gypsum. The deep Yesum consists of very fine sandy loam that makes up approximately 20 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 9 inches of the substratum is light brown, fine sandy loam that is very high in gypsum. Below that, the substratum is pink, very fine sandy loam to a depth of more than 60 inches. The soil is calcareous throughout, and is mildly alkaline. Permeability is moderate. Available water capacity is moderate. Many fine gypsum crystals are found throughout the profile.

The soil type found across the main drainage area for the installation is Mead silty clay loam, 0 to 1 percent slopes. This deep, poorly drained, nearly level soil is on outer fringes of alluvial fans. This soil formed in fine textured alluvium over lacustrine lake sediment. It is very high in salt content because of periodic flooding and poor drainage. Slopes are smooth and concave. Typically, the surface layer is reddish brown, silty clay loam, and clay loam

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approximately 5 inches thick. The substratum, to a depth of 48 inches, is light reddish brown clay that has a high content of salt. Below that, the substratum is lacustrine material of variable texture and color to a depth of more than 60 inches. Included within this soil are areas of Holloman soils and Gypsum Land along the margins of the unit of steep, short gully sides and knolls. These inclusions make up approximately 15 percent of the map unit for this soil type. Individual areas are generally smaller than 10 acres. This soil is moderately calcareous throughout and is moderately to strongly alkaline. It has a layer of salt that is more soluble than gypsum. Permeability is very low. Available water capacity is low (USACE, 2010).

2.6 Regional Hydrogeology

Groundwater occurs as an unconfined aquifer in the unconsolidated deposits of the central basin, with the primary source of recharge as rainfall percolation and minor amounts of stream runoff along the western edge of the Sacramento Mountains. Surface water/rainfall migrates downward into the alluvial sediments at the edge of the shallow aquifer near the ranges and flows through progressively finer-grained sediments towards the central basin. Because the Tularosa Basin is a closed system, water that enters the area leaves either through evaporation or percolation. This elevated amount of percolation results in a fairly high water table. Beneath Holloman AFB, groundwater ranges from 5 to 50 ft below ground surface (bgs). Flow for the base is generally towards the southwest with localized influences from the variations in the topography of the base (Figure 2-3). In the northern and western portions of the base, groundwater flows more to the west towards the Ritas Draw, Malone Draw, and Lost River drainages. Groundwater flow is affected by local topography in areas immediately adjacent to arroyos, where groundwater flows directly toward the drainages regardless of the regional flow pattern.

Groundwater in the Tularosa Basin is of potable quality at the recharge areas in close proximity to the Sacramento Mountains and becomes increasingly mineralized toward the central portion of the basin and discharge areas. The majority (over 70 percent) of the Environmental Restoration Program sites located across Holloman AFB have groundwater monitoring wells containing water with an average total dissolved solids (TDS) concentration greater than 10,000 milligrams per liter (mg/L). These TDS data support the hypothesis that TDS concentrations below 10,000 mg/L at Holloman AFB are caused by dilution of natural groundwater quality from leaking water lines and surface irrigation from the domestic water supply. TDS concentrations greater than 10,000 mg/L exceed the NMWQCC limit as potable water (20.6.2 NMAC), and thus, the groundwater beneath Holloman AFB has been designated as unfit for human consumption. Likewise, the EPA guidelines have identified the groundwater as a Class IIIB water source, characterized by TDS concentrations exceeding 10,000 mg/L, and is characterized by a low degree of

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interconnection with adjacent surface water or groundwater of a higher class. Groundwater does not discharge or connect to any adjacent aquifers, because the Tularosa Basin is a closed basin. Adjacent surface waters include Lost River and Lake Holloman, which also have high concentrations of TDS, and are not considered potential drinking water sources.

2.7 Surface Water and Hydrology

The Tularosa Basin contains all of the surface flow in its boundaries. The nearest inflow of surface waters to Holloman AFB comes from the Lost River, located in the north-central region of the base. The upper reaches of the Three Rivers and the Sacramento River are perennial in the basin. Holloman AFB is dissected by several southwest-trending arroyos that control the surface drainage. Hay Draw arroyo is located in the far north. Malone and Ritas Draws, which drain into the Lost River and Dillard Draw arroyos, are located along the eastern perimeter of the base. Approximately 10,000 years ago, indications that are a much wetter climate existed. The present-day Lake Otero encompassed a much larger area, possibly upwards of several hundred square miles. Its remains are the Alkali Flat and Lake Lucero. Lake Lucero is a temporary feature of merely a few inches in depth during the rainy season.

Ancient lakes and streams deposited water-bearing deposits over the older bedrock basement materials. Fractures, cracks, and fissures in the Permian and Pennsylvanian bedrock yield small quantities of relatively good-quality water in the deeper peripheral. Potable water is only found from wells near the edges of the basin, with more saline water towards the center. Two of the principal sources of potable water are: (1) a long narrow area on the upslope sides of Tularosa and Alamogordo, and (2) in the far southwestern part of the basin. A portion of the city of Alamogordo's water, as well as Holloman AFB's water, is supplied from Bonito Lake (which is in the Pecos River Basin).

2.8 Current and Future Land Use

The land surrounding Holloman AFB consists of residential areas to the east and northeast (city of Alamogordo), rangeland to the south, the White Sands National Monument to the west, and areas where military activities are conducted to the north. The desert terrain of the area immediately surrounding Holloman AFB has limited development, and there are no agricultural operations, residential communities, or large industrial operations located adjacent to the base. The Boles Well Field, a freshwater source for Holloman AFB, is located approximately 6 miles to the southeast of the base. Holloman AFB is an active military installation and is expected to remain active for the foreseeable future. No transfer of military property to the public is anticipated, and public access to the base is restricted. Future land use is not expected to differ significantly from current land use practices (Foster Wheeler Environmental Corporation, 2002).

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2.9 Current and Future Water Use

At present, Holloman AFB receives approximately 50 percent of its freshwater supply from the Boles Well Field. An additional freshwater resource for Holloman AFB, and for the city of Alamogordo, is Bonito Lake, located 60 miles northeast of the Tularosa Basin. Currently, there are no potable supplies of groundwater or surface water located on the base because of poor groundwater quality with TDS concentrations greater than 10,000 mg/L.

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3.0 SOURCE CHARACTERIZATION

This section presents the overall technical approach in general accordance with the *RFI Work Plan* (USACE, 2010) (except where otherwise noted) and details the investigative and remediation activities that were implemented at Building 1201.

The primary environmental media of concern at Building 1201 are soil and groundwater. The extent of contamination in soil was expected to be relatively local to the abandoned septic tank location. Therefore, the basic approach was to identify the former septic tank location and then work outward from the location in identifying contaminated soil. To evaluate the potential impacts to groundwater, a monitoring well was planned for installation in the leach field of each abandoned, inactive, or removed septic tank. The analytical programs for both soil and groundwater focused on the expected nature of contamination likely to be associated with septic tank discharges.

The RFI conducted at abandoned septic tank OT-C538 (Building 1201) was initiated as part of the Midwestern Region Performance-Based Remediation Contract. The *RFI Work Plan* (USACE, 2010) for this site includes the following field work activities: pre-mobilization, mobilization, and site setup activities (under which a geophysical investigation was performed); soil boring advancement; soil sample collection and analysis; monitoring well installation and development; groundwater sampling and analysis; investigation-derived waste (IDW) management; and land surveying. Appendix B provides a photographic log of Building 1201 investigation activities.

3.1 Pre-mobilization/Mobilization Activities

Several pre-investigation documents were filed and approvals obtained, as follows:

- Civil Engineer Work Request (Air Force Form 332) approval
- Base digging permits (Air Force Form 103, Base Civil Engineering Work Clearance Request) with utility clearances
- Site security clearances
- Facility manager notification of the intended operations.

Prior to the start of activities, a pre-investigation kick-off meeting and site walk-through were conducted with the Air Force Civil Engineer Center resident engineer, Holloman AFB personnel, and Shaw's Construction Manager, to plan for equipment access, equipment staging, decontamination area layout, potential site hazards, emergency evacuation routes, and project schedule.

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Prior to the submittal of the base digging permits, the drilling locations were delineated using marker flags, stakes, and paint. Utility clearance approvals were completed by the appropriate Holloman AFB utility office (i.e., telephone, sewer, water, natural gas, etc.), and by the New Mexico One Call utility clearance system. Upon receipt of the approved digging permit and utility clearances, Shaw's Construction Manager completed a site walk-through to confirm the utility and intrusive work locations. In addition, Shaw performed a site survey prior to the start of drilling activities to search for signs of other buried or overhead utilities.

3.2 Geophysical Investigation

A geophysical investigation was performed at Building 1201 in an attempt to define the limits of the abandoned septic system. Methods employed included: visual inspection, electromagnetic induction conductivity detection, ground-penetrating radar (GPR), and electromagnetic pipe and cable location.

Electromagnetic induction conductivity detection ground induction methods are employed to detect broad metal mass anomalies or conductive zones that may be indicative of potential septic tanks, and lateral changes in conductive zones of soil or backfill materials relative to native soil. GPR is used to detect abandoned septic tank excavation sidewalls and fill areas. An electromagnetic pipe and cable sSurvey was conducted to detect buried utility lines.

Electromagnetic and GPR surveys were conducted at Building 1201 in June 2012. The location of the abandoned septic tank and leach field were identified south of Building 1201 and the chain link fence surrounding the area. The locations of the individual leach field piping could not be directly detected by the geophysical survey due to the similarity of composition of the clay pipes and the surrounding soil. However, the leach field could be identified by the geophysical survey equipment due to the differences in mineralization and conductivity between the native soil and the soils that were physically affected by normal leach field operation. The presence of the leach field piping was assumed within the leach field as identified by the geophysical survey which allowed for representative soil and groundwater sample collection. A buried communication line was identified running parallel to the chain link fence. Geophysical findings are shown on Figure 3-1. The complete geophysical report is included in Appendix C.

3.3 Soil Investigation

The soil investigation of the abandoned septic tank at Building 1201 was conducted on June 29, 2012. The program consisted of sampling four borings advanced at the abandoned septic tank location, as shown on Figure 3-1. Soil boring OT-C538-Station 1 (sample numbers OTC538-IS-0001-062912, OTC538-IS-0002-062912 and OTC538-IS-0003-062912-FD) was placed north of the abandoned septic tank along the influent line, OT-C538-

Station 2 (sample numbers OTC538-IS-0004-062912, and OTC538-IS-0005-062912) was placed at the abandoned septic tank location, OT-C538-Station 3 (samples numbers OTC538-IS-0006-062912 and OTC538-IS-0007-062912) was placed south of the abandoned septic tank near the effluent line, and OT-C538-Station 4 (sample numbers OTC538-IS-0008-062912, OTC538-IS-0009-062912, OTC538-IS-0010-062912, and OTC538-IS-0011-062912) was placed in the leach field of the abandoned septic tank. All borings were advanced using direct push technology (DPT), with soil samples collected at depths of 3 to 5 ft and 10 to 12 ft at OT-C538-Station 1; and 7 to 9 ft and 14 to 16 ft at OT-C538-Station 2; 3 to 5 ft and 10 to 12 ft at OT-C538-Station 3; and 0 to 2 ft, 3 to 5 ft, 10 to 12 ft, and 25 to 27 ft at OT-C538-Station 4. A field duplicate was collected from the 10 to 12 ft depth at Station 1. A confirmation sample (OTC538-IS-0012-110612) was collected from 25 to 27 ft bgs at Station 4 on November 6, 2012 and analyzed for TAL metals based on results from samples collected in June. Appendix D contains copies of the sample collection logs.

Soil samples were logged in the field in accordance with the Unified Soil Classification System requirements, and sample depths were in general accordance with the *RFI Work Plan* (USACE, 2010). Soil samples were not screened with a photoionization detector since there was no visual evidence of contamination. Appendix E contains copies of the soil boring logs.

Soil samples for volatile organic compound (VOC) analysis were collected in accordance with EPA Method 5035, using a TerraCore® Sampler device (EPA, 1986), while non-VOC sample aliquots were placed in laboratory-provided containers. Samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), explosives, polychlorinated biphenyls (PCBs), target analyte list (TAL) metals, total petroleum hydrocarbons (TPH)-gasoline range organics (GRO), TPH-diesel range organics (DRO), TPH-oil range organics (ORO), cyanide, percent solids, and tritium by Accutest Laboratories, Inc., a National Environmental Laboratory Accreditation Program-accredited laboratory, using EPA analytical methods, as summarized on Table 3-1.

The excess sample core soil extracted using the DPT drilling method was placed in 55-gallon drums for later characterization and transport to a licensed disposal facility. The boreholes were abandoned upon completion by plugging from the bottom of the borehole to ground surface using bentonite pellets. Soil boring equipment was decontaminated between borings as detailed in Holloman AFB Standard Operating Procedure 2, “Sampling Equipment Decontamination” (located in Appendix B of the *RFI Work Plan* [USACE, 2010]) and Shaw’s Standard Operating Procedure No. EI-FS-014, “Decontamination of Contact Sampling Equipment.”

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3.4 Groundwater Investigation

One monitoring well was installed at the Building 1201 to determine any impacts to groundwater. Well OTC538-MW01 was installed in the leach field, within the soil boring designated as OT-C538-Station 4, approximately 40 ft southeast of the abandoned septic tank location, as shown on Figure 3-1.

The monitoring well was installed using hollow-stem auger drilling techniques in accordance with NMED Ground Water Quality Bureau *Monitoring Well Construction and Abandonment Guidelines* (NMED, 2011). The 10-inch borehole was advanced approximately 4 ft into the water table at approximately 27 ft bgs and completed such that the top of the well screen was set above the approximate level of the groundwater observed during drilling. The monitoring well was constructed of 2-inch-diameter Schedule-40 polyvinyl chloride riser with 2-inch diameter, Schedule-40 polyvinyl chloride screen fitted with prepacked, very fine stainless-steel meshing (Appendix F). The screened section of the well was 5 ft long (as opposed to the stipulated 10 ft in the *VCM Request* (Shaw, 2012b); the variance is based on observed lithology). A silica sand filter pack was placed around the screen to approximately 2 ft above the top of the screen, with a 2-ft thick bentonite seal placed above the filter pack. The remaining annular space was grouted with cement and bentonite.

The monitoring well was constructed as a "flush-mount" surface completion with a water-tight well vault, locking, expandable well plug, and finished to surrounding grade. Table 3-2 and Appendix F provide monitoring well construction details.

The newly installed monitoring well was developed to create an effective filter pack around the well screen, remove fine particles from the formation near the borehole, and assist in restoring the natural water quality of the aquifer in the vicinity of the well. Development occurred one day after installation to allow for grout curing. Surging and pumping were both employed to achieve the most effective well development.

Information recorded during well development included water-level measurements, depth-to-bottom measurements, water-quality parameters (pH, temperature, and specific conductance), discharge-water color, water volume, and time period. Well development was performed until the following criteria were met:

- Water removed from the well was visually clear, and the turbidity measures were less than or equal to 10 nephelometric turbidity units. In cases where the turbidity criterion was not met, other water quality parameters indicated sufficient well development.

- The pH, temperature, and specific conductance parameters were stabilized (less than 10 percent variation for three successive readings).

Groundwater sampling was conducted at OTC538-MW01 on July 12, 2012 using low-flow sampling techniques. Water quality indicator parameters were measured and recorded during purging of the monitoring wells (Appendix G) using a field-calibrated water quality meter. Table 3-3 contains final water quality readings from the sampling event. Once indicator parameters had stabilized, a groundwater sample was collected for TDS, VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, and tritium analyses by Accutest Laboratories, Inc.

Based on a request from the NMED to confirm that TDS values remained above 10,000 mg/L, Shaw personnel returned to Building 1201 on May 16, 2013 to collect another groundwater sample from OTC538-MW01. However, as shown on the monitoring well purge record in Appendix G, no sample was collected because the well was purged dry and did not recharge.

3.5 Investigation-Derived Waste

The nonhazardous IDW generated during the RFI at Building 1201 (OT-C538) was segregated into the following categories:

- Soil – drill cuttings soil
- Water – decontamination and monitoring well purge liquids.

Upon generation, investigation-derived waste was properly containerized and temporarily stored at the designated laydown yard, as specified by Holloman AFB. Wastes were contained in sealed, U.S. Department of Transportation–approved, steel 55-gallon drums (for soil cuttings and decontamination water), roll-off containers with liners and covers (for excavated waste soil), and a 1,400-gallon plastic tank (for waste water). The waste soil drums were emptied into 20-cubic yard roll-off containers, and the waste waters were pumped into a bulk plastic tank prior to characterization sampling and analysis for disposal. The drill cuttings from the Building 1201 site were placed into the 20-cubic-yard roll-off containers along with soils from other Holloman AFB investigation sites.

3.6 Site Surveying

Soil borings and other site features shown on Figure 3-1 were surveyed by Albuquerque Surveying Company, Inc. from Albuquerque, New Mexico, a state-licensed surveyor.

Horizontal coordinates are referenced to the North American Datum 1983 State Plane Coordinate System, New Mexico-Central, and surveyed to an accuracy of ±1.0 ft. Vertical

elevations are referenced to the North American Vertical Datum 1988 coordinate system to an accuracy of ±0.01 ft. A copy of the survey results is presented in Appendix H.

3.7 Decontamination Procedures

A decontamination pad was constructed at the designated laydown area for decontamination of all downhole drilling equipment. The drilling rig was decontaminated prior to entering the site. Drilling equipment that came into contact with the borehole was decontaminated by hot-water pressure washing. Disposable equipment used for soil sample collection did not require decontamination.

4.0 INVESTIGATION RESULTS AND EVALUATION

Soil analytical results presented in this section were used to delineate constituents of concern that may have been released to the environment, and confirm that no additional remedial measures are required.

4.1 Soil Analytical Results

DPT soil boring samples and one confirmation sample were collected during the Building 1201 RFI, at the locations shown on Figure 3-1. All soil samples were sent to Accutest Laboratories, Inc. for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium analyses. Analytical results for the soil samples are presented in Table 4-1. Laboratory analytical data packages, and the data validation checklists for the soil sample data, are provided in Appendix I.

The analytical results for metals in Table 4-1 show that Holloman AFB soil samples contain significant amounts of calcium, typically greater than 100,000 milligrams per kilogram (mg/kg) (10 percent), and can be as high as 250,000 mg/kg (25 percent). Calcium at these levels contributes spectral interferences during inductively-coupled plasma metals analysis, and can also clog the nebulizer that is used to introduce the sample. Sample dilution is the recommended method for solving both the spectral interference issue and the nebulizer clogging issue. However, sample dilution raises the analytical method detection limits (MDLs) for all associated metals, including thallium.

A typical method detection limit for thallium during inductively-coupled plasma analysis is 0.13 mg/kg. Diluting by a factor of 5 to 20 to eliminate calcium spectral interference and nebulizer clogging causes the thallium detection limit to be elevated by a factor of 5 to 20. This results in a MDL that is above the NMED residential SSL of 0.782 mg/kg thallium. Consequently, the required remedy to allow for proper equipment operation resulted in MDLs that were above the NMED residential SSL. However, thallium is not an element that is anticipated to be present at Building 1201 as a result of normal septic tank operation and maintenance.

The validated soil analytical results were compared with the NMED SSLs (NMED, 2012a), or the EPA RSLs (EPA, 2012a), if an NMED residential SSL was not established for a given analyte. In addition, a TPH screening level of 1,000 mg/kg was used to evaluate the laboratory analytical data. The 1,000 mg/kg action level for petroleum-contaminated soil is the Residential Direct Exposure Limit for unknown oil, listed in Table 6-2, TPH Screening Guidelines for Potable Groundwater, of the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a).

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The arsenic detection in OTC538-IS-0011-062912 (OT-C538-Station 4, 25 to 27 ft bgs) exceeded the NMED residential SSL. No other parameters had detections above the NMED residential SSL screening criteria in sample OTC538-IS-0011-062912, and all other samples met the NMED SSL criteria for all analytes. Likewise, all soil samples from all locations and depths had TPH-GRO, TPH-DRO, and TPH-ORO concentrations below the TPH screening level, and no tritium or cyanide was detected in any of the soil samples. A confirmation sample was collected on November 6, 2012 at OT-C538-Station 4, 25 to 27 ft bgs. The arsenic concentration in the confirmation sample, OTC538-IS-0012-110612, was reported at 8.1 mg/kg, which is above the NMED residential SSL (3.90 mg/kg).

Lead was detected in OTC538-IS-0004-062912 (OT-C538-Station 2, 7 to 9 ft bgs) at a concentration of 80.4 mg/kg which exceeds the Holloman AFB soil background value (10.9 mg/kg), but is below the NMED residential SSL screening criteria (400 mg/kg). Vanadium was detected in OTC538-IS-0011-062912 (OT-C538-Station 4, 25 to 27 ft bgs) at a concentration of 45.8 mg/kg which exceeds the Holloman AFB soil background value (42.6 mg/kg), but is below the NMED residential SSL screening criteria (391 mg/kg). No other soil detections exceeded the Holloman AFB soil background values.

4.2 Groundwater Analytical Results

One monitoring well (OTC538-MW01) was installed during the abandoned septic tank investigation, at the location shown on Figure 3-1. A groundwater sample from the well was collected for TDS, VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, and tritium analyses by Accutest Laboratories, Inc. Because the Building 1201 groundwater sample had a TDS value of 12,600 mg/L no other analyses were performed.

The analytical TDS result for the Building 1201 groundwater sample is shown in Table 4-2. The laboratory analytical data package and the data validation checklist for the groundwater sample are provided in Appendix I.

Based on a request from the NMED to confirm that TDS values remained above 10,000 mg/L and to analyze for additional parameters, Shaw personnel returned to Building 1201 on May 16, 2013 to collect another groundwater sample from OTC538-MW01. However, as shown on the monitoring well purge record in Appendix G, no sample was collected because the well was purged dry and did not recharge. The ephemeral nature of shallow groundwater at Building 1201 was observed at numerous other sites during the Holloman AFB RFIs, and lends uncertainty as to the reliability of the shallow groundwater (upper water table) as a water source. Furthermore, as stated in Section 3.2.4.2 of the *RFI Work Plan* (USACE, 2010), groundwater may not require testing if it is determined that limited impacts to the soil column have been realized from the septic tanks leach field. As

detailed in Section 4.1, only arsenic was detected in soil above the NMED residential SSL, from one location at a depth of 25 to 27 ft bgs. Shallower soil samples from the expected leach field depth (0 to 5 ft bgs) had arsenic concentrations below the NMED SSL, thus the arsenic detected deeper in the soil column is not likely to be due to the leach field operations.

4.3 Investigation-Derived Waste Analytical Results

A bulk waste characterization sample (LDY-IDW-01-090412) was collected from the bulk waste soil and analyzed for Toxicity Characteristic Leaching Procedure VOCs, SVOCs, and RCRA metals. The results are presented in Table 4-3. None of the waste soil analytical results were above the 40 Code of Federal Regulations Part 261.24 limits. The waste soil was managed as nonhazardous waste and was subsequently transported to Otero/Greentree Regional Landfill, Alamogordo, New Mexico for disposal (Waste Manifest in Appendix J).

The bulk wastewater was sampled and analyzed for VOCs, SVOCs, TAL metals, TPH-GRO, TPH-DRO, and TPH-ORO, with the analytical results presented in Table 4-4. The analytical results were reviewed by the Holloman AFB wastewater treatment plant personnel, and subsequently accepted for disposal.

4.4 Geochemical Evaluation of Arsenic in Soil

4.4.1 Introduction

This section summarizes the geochemical evaluation of arsenic concentrations in soil from the Building 1201 site at Holloman Air Force Base (Appendix K contains the detailed evaluation). The 11 soil samples considered in this evaluation were obtained in June, 2012 at several depth intervals ranging from 0 to 2 ft to 25 to 27 ft bgs. All of the samples were analyzed for the full suite of 23 TAL metals. A confirmatory sample (OTC538-IS-0012-110612, 25 to 27 ft bgs) collected adjacent to OT-C538-Station 4 on November 6, 2012, was analyzed for arsenic and iron only. Arsenic is evaluated here because the NMED residential SSL of 3.9 mg/kg for arsenic was exceeded in samples OTC538-IS-0011-062912, 25 to 27 ft bgs (19.2 mg/kg) and OTC538-IS-0012-110612, 25 to 27 ft bgs (8.1 mg/kg).

Analyses of 42 background subsurface samples were used for comparison in the evaluation. These background samples were obtained from depths of 7 to 30 ft bgs at intervals that were above the water table. Descriptions of the background samples can be found in the *Basewide Background Study Report for Holloman Air Force Base* (Nation View Bhate, 2009).

4.4.2 Geochemical Evaluation Results

Aluminum and iron are evaluated first to verify that the iron concentrations are natural and that they are, therefore, suitable for use as reference elements for the evaluation of arsenic.

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4.4.2.1 Aluminum and Iron

Aluminum has a mean concentration of 5,500 mg/kg in the 11 site samples. Aluminum is a primary component of common soil-forming minerals such as clays, feldspars, and micas. Aluminum is always trivalent (as Al^{3+}) and can substitute for ferric iron (Fe^{3+}) in iron oxide minerals. It can also adsorb on iron oxide surfaces (Cornell and Schwertmann, 2003).

Iron has a mean concentration of 6,000 mg/kg in the site samples, and is dominantly present as iron oxides. Iron oxides are common soil-forming minerals and occur as discrete mineral grains or as coatings on silicate minerals (Cornell and Schwertmann, 2003).

Clays and iron oxides tend to exist as very fine particles, so both aluminum (a proxy for clay content) and iron (a proxy for iron oxide content) are enriched in samples with finer grain sizes. The geochemical evaluation indicated that the background samples and most of the site samples have similar Fe/Al ratios. The one exception is OTC538-IS-0011-062912, which has an anomalously high Fe/Al ratio, possibly indicating that the iron was not naturally occurring in this sample. Note that the Fe/Al ratio in OTC538-IS-0012-110612 could not be evaluated since aluminum analysis was not performed.

4.4.2.2 Arsenic

Arsenic is known to associate with iron oxide minerals, as discussed in Appendix K. A soil sample that is naturally enriched in iron oxides is expected to be naturally enriched in arsenic. Plots of both arsenic versus iron concentrations and arsenic versus arsenic/iron ratio (provided in Appendix K) indicate that samples OTC538-IS-0011-062912 and OTC538-IS-0012-110612 have more arsenic than can be explained by iron content, possibly indicating that arsenic was not naturally occurring in these samples. Appendix K contains the detailed geochemical evaluation.

4.5 Risk-Based Evaluation

4.5.1 Soil

Twelve soil samples were collected at Building 1201, from depths of 0 to 27 ft bgs, during the abandoned septic tank investigation. Per NMED (2012a), the soil depths of interest for a risk evaluation are 0 to 10 ft bgs for construction workers and residential receptors, and 0 to 1 ft bgs for commercial/industrial workers. Therefore, results from the screening assessment (Table 4-1) that present data for 0 to 10 ft bgs were used for the risk evaluation. Based on the results of the initial screening evaluation, no constituents of potential concern (COPC) have a concentration greater than NMED residential SSLs or EPA residential RSLs (if NMED values have not been established).

Total cancer risk ratios and total hazard ratios (hazard index [HI]) to address potential additive toxicological effects were also assessed (per NMED 2012a, Section 5.0). This was

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conducted by using maximum detected concentrations of carcinogens and non-carcinogens, estimating risk and hazard ratios, and scaling a total cancer risk and total HI. The total cancer risk did not exceed 1.0×10^{-5} (total cancer risk: 5.4×10^{-6}), as shown in Appendix L. The total HI based on maximum detected concentrations was equal to 0.76 (Appendix L). As the target HI is 1.0, this is acceptable because the HI does not exceed 1.0.

Arsenic was detected in two samples (investigative soil sample OTC538-IS-0011-062912 and confirmatory soil sample OTC538-IS-0012-110612) at concentrations (19.2 mg/kg and 8.1 mg/kg, respectively). These results exceed the NMED soil screening value of 3.9 mg/kg for arsenic; however both samples were collected at a depth interval of 25 to 27 ft bgs. Two shallower, co-located samples collected at depths of 0 to 2 ft bgs and 3 to 5 ft bgs had arsenic concentrations below the screening value.

Therefore, there are no COPCs in soil and future residential, current and future commercial/industrial worker, and current and future construction worker exposure scenarios are not health risks.

4.5.2 Groundwater

One groundwater sample was collected from the Building 1201 monitoring well OTC538-MW01 on July 12, 2012. The TDS analytical result was 12,600 mg/L. Because TDS analytical results were greater than 10,000 mg/L, VOC, SVOC, explosive, PCB, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, and tritium analyses were not performed.

TDS concentrations greater than 10,000 mg/L exceed the NMWQCC limit as potable water and thus, the groundwater at Building 1201 (OT-C538) Holloman AFB is designated as unfit for human consumption. Likewise, the EPA guidelines have identified this groundwater as a Class IIIB water source, characterized by TDS concentrations exceeding 10,000 mg/L and also characterized by a low degree of interconnection with adjacent surface water or groundwater of a higher class. Groundwater does not discharge or connect to any adjacent aquifers because the Tularosa Basin is a closed basin. Adjacent surface waters include Lost River and Lake Holloman, which also have high concentrations of TDS, and are not considered potential drinking water sources.

Note that this sampling/analytical protocol was presented in the Septic Tank *VCM Request* (Shaw, 2012b) document, but was challenged by NMED during the commenting period. As a result, an attempt to resample the well was made on May 16, 2013 to verify the TDS concentration and to collect the full suite of analytical parameters specified for this program. However, the monitoring well was purged dry prior to sampling and did not recharge. The well went dry after approximately one gallon of water was removed, and the well did not recover after resting for one hour.

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4.5.3 Risk-Based Conclusions

4.5.3.1 Soil

No COPCs were selected for soil; therefore, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not health risks. Additionally, total cancer risks and non-cancer hazards in soil were acceptable.

4.5.3.2 Groundwater

The TDS concentration was greater than 10,000 mg/L in Building 1201 groundwater. An attempt to re-sample the monitoring well (so that the entire analytical suite could be performed) resulted in insufficient groundwater recharge for collection of a sample.

4.5.4 Ecological Evaluation

The former septic system at Building 1201 was located in a sandy to gravelly, flat-lying area outside the building's yard. This area is moderately vegetated, as shown in the photographic log in Appendix B. A screening-level ecological risk assessment (SLERA) Scoping Assessment Site Assessment Checklist was completed for the Building 1201 (OT-C538) septic tank system and is included in Appendix M. Results of the checklist Exclusion Criteria Decision Tree indicate that the site is a potential viable ecological habitat and a potential exposure pathway exists for soil; therefore, the SLERA was performed.

Soil data results from 0 to 10 ft bgs were included in the comparison and are provided on Table A in Appendix M. According to NMED (2012c), this is the potential depth of interest for wildlife, including burrowing animals. As shown on Table A (Appendix M), five soil samples were available within the 0 to 10 ft bgs zone. Detected constituents in soil included 16 metals and petroleum hydrocarbons (oil range organics). All other constituents analyzed for were not detected.

Metals concentrations were compared to Holloman soil background values (Table A, Appendix M). Detected concentrations of metals did not exceed Holloman soil background values in any soil samples evaluated, except for lead. Therefore, further evaluation was conducted for lead.

Lead was detected in four of five soil samples collected from around the former Building 1201 septic system, with concentrations ranging from 2.3 mg/kg to 80.4 mg/kg. Only the maximum concentration of lead (80.4 mg/kg) exceeds its Holloman AFB background value (10.9 mg/kg). The detected concentrations of lead in the soil collected at the site were compared to the lowest available ecological screening levels (ESLs) as presented in the Los Alamos National Laboratory (LANL) Eco Risk Database version 3.1 (LANL, 2012). The LANL database provides both No-Effect ESLs and Low-Effect ESLs for

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soil, and both values are provided in Table A of Appendix M. This concentration exceeds four of the No-Effect ESLs and three of the corresponding Low-Effect ESLs as shown in the chart below. ESLs that are exceeded include those for avian herbivores, insectivores, and omnivores, and mammalian insectivores.

The lead ESLs (from LANL, 2012) are as follows:

Receptor	No-Effect ESL	Low-Effect ESL	Units
American kestrel (Avian intermediate carnivore)	120	240	mg/kg
American kestrel (Avian top carnivore)	810	1600	mg/kg
American robin (Avian herbivore)	21	42	mg/kg
American robin (Avian insectivore)	14	28	mg/kg
American robin (Avian omnivore)	16	33	mg/kg
Deer mouse (Mammalian omnivore)	120	230	mg/kg
Desert cottontail (Mammalian herbivore)	370	700	mg/kg
Earthworm (Soil-dwelling invertebrate)	1700	8400	mg/kg
Generic plant (Terrestrial autotroph - producer)	120	570	mg/kg
Montane shrew (Mammalian insectivore)	72	130	mg/kg
Red fox (Mammalian top carnivore)	3700	7000	mg/kg

Since the lead MDC exceeds four No-Effect ESLs and its Holloman AFB background value, an EPC for lead was calculated to compare with the ESLs.

Detected concentrations of petroleum hydrocarbons in soil data collected at the site could not be compared to ecological screening levels since ecological screening levels have not been established for petroleum hydrocarbons (LANL, 2012).

Estimation of EPCs. Per the Work Plan (USACE, 2010), more representative site-specific EPCs should be compared with screening values. EPCs are based on 95 percent UCL of the mean, if possible, estimated using EPA's ProUCL statistical software, version 4.1.01 (EPA, 2010 and EPA, 2011). Using ProUCL, the 95 percent UCLs for lead exceeded the maximum value using the UCL recommended by the ProUCL program. Therefore, as an alternative to the UCL, the mean concentration was used as the EPC for lead. The mean EPC for lead as determined by the ProUCL software is 22 mg/kg. The Pro UCL output is provided in Appendix M.

The site mean concentration for lead (22 mg/kg) also exceeds three of the No-Effect ESL for avian receptors; however, no Low-Effect ESLs are exceeded. Since only the avian No-Effect ESLs are exceeded by the site mean concentration for lead and no Low-Effect ESLs are

exceeded, it is reasonable to conclude that potential ecological impacts to avian populations at the site are unlikely.

Since all detected site concentrations of metals, except for lead, are below their respective background screening values, it is concluded that risks to the ecological system at and surrounding the site are acceptable. Lead was further evaluated by comparison of site maximum and mean concentrations to ESLs available from LANL (2012). Impacts to populations of ecological receptors at the site from lead concentrations in soil are not likely to occur. Based on these findings, it is concluded that hazards to the ecological system at and surrounding the former Building 1201 septic system site are acceptable.

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5.0 DATA QUALITY ASSURANCE AND DATA QUALITY CONTROL REVIEW

All analytical data was reviewed in accordance with EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA, 2004a) and the EPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (EPA, 2004b). Data qualifiers were added to the database prior to project use. The data tables provided in Section 4.0 show the data qualifiers added during data validation. Detailed data validation checklists for each data deliverable are provided in Appendix I.

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6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary and Conclusions

6.1.1 Soil

Twelve soil samples were collected at various Holloman AFB Building 1201 locations during the abandoned septic tank investigation. The samples were analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium. Validated analytical results were compared with the NMED residential SSLs, the NMED Residential Direct Exposure Limit for soil contaminated with unknown petroleum oil, and the Holloman AFB soil background values. No samples from the 0 to 10 ft bgs zone had constituent concentrations that exceeded the New Mexico residential SSLs or the Holloman AFB soil background values. The only parameter that exceeded the New Mexico Residential Soil screening was arsenic in one sample, at a depth where human health exposure is not expected. No TPH was detected above 1,000 mg/kg in any of the soil samples from any depth or location.

No COPCs were selected for soil; therefore, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not health risks. Additionally, total cancer risks and non-cancer hazards in soil were acceptable.

The ecological evaluation determined that all site metals concentrations (with the exception of lead) were below Holloman AFB soil background values within the ecological receptor zone of interest (i.e., 0 to 10 ft bgs). Lead was further evaluated by comparing the site maximum and mean concentrations to LANL ESLs (LANL, 2012). Impacts to ecological receptor populations from soil lead are not likely to occur. Based on these findings, it is concluded that potential risk to the ecological system at from the former Building 1201 septic system site are acceptable.

6.1.2 Groundwater

One groundwater sample was collected in July 2012 from the Building 1201 monitoring well OTC538-MW01, and had a TDS concentration greater than 10,000 mg/L. A second groundwater sample event was attempted in May 2013 - to analyze for the entire analytical suite and confirm that TDS remained above 10,000 mg/L. However the well was purged dry prior to sampling and the well did not recover sufficiently to allow for sample collection. Risk-based health screening was not performed since there were no COPCs identified in groundwater.

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6.2 Recommendations

6.2.1 Soil

No COPCs were detected in soil above the NMED residential SSLs and no unacceptable ecological risk was identified for the site and its surroundings; therefore, no additional corrective action is recommended for soil at Building 1201.

6.2.2 Groundwater

The TDS concentration for the single groundwater sampling event on July 12, 2012 was greater than 10,000 mg/L, and is therefore designated as unfit for human consumption. In addition, the EPA guidelines have identified this groundwater as a Class IIIB water source. Furthermore, there was insufficient groundwater for sampling during the additional attempt to sample for further analyses in May 2013. Based on the ephemeral nature of shallow groundwater and the elevated groundwater TDS concentration, no corrective action is recommended for groundwater at Building 1201.

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Tables

Table 3-1
Sample Summary
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Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C538-Station1	681010.2876	1690052.9610	6/29/2012	Investigation Soil	3 - 5	OTC538-IS-0001-062912	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/29/2012	Investigation Soil	10 - 12	OTC538-IS-0002-062912	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/29/2012	Investigation Soil - Field Duplicate	10 - 12	OTC538-IS-0003-062912-FD	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C538-Station2	680973.3473	1690014.4262	6/29/2012	Investigation Soil	7 - 9	OTC538-IS-0004-062912	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/29/2012	Investigation Soil	14 - 16	OTC538-IS-0005-062912	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OT-C538-Station 3	680956.8871	1690016.9095	6/29/2012	Investigation Soil	3 - 5	OTC538-IS-0006-062912	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/29/2012	Investigation Soil	10 - 12	OTC538-IS-0007-062912	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OTC538-MW01 (OT-C538-Station 4)	680940.5579	1690045.5512	6/29/2012	Investigation Soil	3 - 5	OTC538-IS-0008-062912	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/29/2012	Investigation Soil	10 - 12	OTC538-IS-0009-062912	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/29/2012	Investigation Soil	0 - 2	OTC538-IS-0010-062912	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/29/2012	Investigation Soil	25 - 27	OTC538-IS-0011-062912	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OTC538-MW01 (OT-C538-Station 4)	680940.5579	1690045.5512	11/6/2012	Investigation Soil	25 - 27	OTC538-IS-0012-110612	Percent Solids	SM2540G
							TAL Metals	SW6010C
								SW6020A
			7/12/2012	Groundwater	NA	OTC538-GW-5381-071212	Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
							TDS	SM2540C

Table 3-1
Sample Summary
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

[a] Coordinates are referenced to the North American Datum, 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] EPA, 2007, Test Methods for Evaluating Soil Waste Physical/Chemical Methods, EPA Publication SW-846, Final Update IV. Available online at www.epa.gov/osw/hazard/testmethods/sw846.

Percent Solids and Total Dissolved Solids from *Standard Methods for the Examination of Water and Wastewater*, 19th edition, 1995.

bgs	Below ground surface.
DRO	Diesel range organics.
EPA	Environmental Protection Agency
FD	Field Duplicate.
ft	Feet/foot.
GRO	Gasoline range organics.
GW	Groundwater.
IS	Investigation Soil.
MW	Monitoring Well.
NA	Not Applicable.
ORO	Oil range organics.
PCB	Polychlorinated Biphenyl.
STA	Station.
SVOC	Semivolatile organic compound.
TAL	Target analyte list.
TDS	Total Dissolved Solids.
TPH	Total petroleum hydrocarbons.
VOC	Volatile organic compound.

Table 3-2
Monitoring Well Construction Details and Groundwater Elevation Data
Building 1201 (OT-C538)
Holloman Air Force Base, New Mexico

Well ID	Monitoring Well Construction Details						Groundwater Elevation Data: 7/3/2012		
	Location Coordinates		Installation Date	Well Diameter (in)	Well Depth at Construction (ft bgs)	Screened Interval (ft bgs)	Top of PVC Riser Pipe Elevation[b] (ft amsl)	Depth to Water (ft below top of PVC riser pipe)	Potentiometric Surface Elevation[b] (ft amsl)
	Grid Northing[a]	Grid Easting[a]							
OTC538-MW01	680940.5579	1690045.5512	7/2/2012	2	31.0	26.0-31.0	4109.43	29.72	4079.71

[a] *Location coordinates are referenced to the North American Datum 1983 State Plane Coordinate System, New Mexico - Central, feet.*

[b] *Elevations are referenced to the North American Vertical Datum of 1988 (NAVD 88).*

ft = feet.
ft amsl = feet above mean sea level.
ft bgs = feet below ground surface
ID = identification.
in = inches.

Table 3-3
Monitoring Well Purge Water Quality Parameters
Building 1201 (OT-C538)
Holloman Air Force Base, New Mexico

Well ID	Sample Date	Depth to Water (ft below top of PVC riser pipe)	Total Depth (ft below top of PVC riser pipe)	Purge Water Volume (gallons)	Temperature (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	TDS (g/L)
OTC538-MW01	7/12/2012	29.70	33.31	1.5	19.68	7.18	16.21	1.0	5.59	305.4	10.52

°C = degrees Celsius.
DO = dissolved oxygen.
ft = feet
g/L = grams per liter.
ID = identification.
mg/L = milligrams per liter.
mS/cm = millisiemens per centimeter.
mV = millivolts.
NTU = Nephelometric Turbidity Unit.
ORP = oxidation-reduction potential.
PVC = polyvinylchloride
TDS = total dissolved solid.

Table 4-1
Soil Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC538-IS-0001-062912		OTC538-IS-0002-062912		OTC538-IS-0003-062912-FD		OTC538-IS-0004-062912		OTC538-IS-0005-062912		OTC538-IS-0006-062912		OTC538-IS-0007-062912		OTC538-IS-0008-062912		OTC538-IS-0009-062912		OTC538-IS-0010-062912	
				Sample Date	6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location	STA 1		STA 1		STA 1		STA 2		STA 2		STA 3		STA 3		MW-01 (STA 4)		MW-01 (STA 4)		MW-01 (STA 4)	
				Depth (ft bgs)	3 - 5		10 - 12		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**82.2**		**88.1**		**88.3**		**90.4**		**89.1**		**87.7**		**89.5**		**87.1**		**88.4**		**88.6**	
VOLATILES (mg/kg)																								
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0011	U	0.0011	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00099	U	0.0011	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0012	U	0.0012	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0017	U	0.0017	U	0.0016	U	0.0018	U	0.0017	U	0.0018	U	0.0017	U	0.0018	U	0.0015	U	0.0016	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0011	U	0.0011	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00099	U	0.0011	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0011	U	0.0011	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00099	U	0.0011	U
1,1-DICHLOROETHENE	NE	240	449		0.0014	U	0.0014	U	0.0013	U	0.0015	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0013	U	0.0014	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0012	U	0.0012	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0023	U	0.0023	U	0.0022	U	0.0024	U	0.0023	U	0.0025	U	0.0023	U	0.0024	U	0.0021	U	0.0022	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.00099	U	0.001	U	0.00095	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.0009	U	0.00096	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0011	U	0.0011	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00099	U	0.0011	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.00099	U	0.001	U	0.00095	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.0009	U	0.00096	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0012	U	0.0012	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0012	U	0.0012	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0011	U	0.0011	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00099	U	0.0011	U
2-HEXANONE	NE	210	NE		0.0054	U	0.0055	U	0.0051	U	0.0057	U	0.0054	U	0.0058	U	0.0054	U	0.0056	U	0.0048	U	0.0052	U
ACETONE	NE	61000	66600		0.02	U	0.02	U	0.019	U	0.021	U	0.02	U	0.022	U	0.02	U	0.021	U	0.018	U	0.019	U
BENZENE	NE	1.1	15.4		0.0015	U	0.0015	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U	0.0014	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0011	U	0.0011	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00099	U	0.0011	U
BROMOFORM	NE	62	616		0.0015	U	0.0015	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U	0.0014	U
BROMOMETHANE	NE	7.3	16.5		0.002	U	0.002	U	0.0019	U	0.0021	U	0.002	U	0.0022	U	0.002	U	0.0021	U	0.0018	U	0.0019	U
CARBON DISULFIDE	NE	820	1530		0.002	U	0.002	U	0.0019	U	0.0021	U	0.002	U	0.0022	U	0.002	U	0.0021	U	0.0018	U	0.0019	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0018	U	0.0018	U	0.0017	U	0.0019	U	0.0018	U	0.0019	U	0.0018	U	0.0019	U	0.0016	U	0.0017	U
CHLOROBENZENE	NE	290	376		0.00099	U	0.001	U	0.00095	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.0009	U	0.00096	U
CHLOROETHANE	NE	15000	29800		0.002	U	0.002	U	0.0019	U	0.0021	U	0.002	U	0.0022	U	0.002	U	0.0021	U	0.0018	U	0.0019	U
CHLOROFORM	NE	0.29	5.86		0.0012	U	0.0012	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U
CHLOROMETHANE	NE	120	275		0.002	U	0.002	U	0.0019	U	0.0021	U	0.002	U	0.0022	U	0.002	U	0.0021	U	0.0018	U	0.0019	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0015	U	0.0015	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U	0.0014	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.00099	U	0.001	U	0.00095	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.0009	U	0.00096	U
CYCLOHEXANE	NE	7000	NE		0.0014	U	0.0014	U	0.0013	U	0.0015	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0013	U	0.0014	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.00099	U	0.001	U	0.00095	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.0009	U	0.00096	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0015	U	0.0015	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U	0.0014	U
ETHYLBENZENE	NE	5.4	68.4		0.00099	U	0.001	U	0.00095	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.0009	U	0.00096	U
ISOPROPYLBENZENE	NE	2100	2430		0.0011	U	0.0011	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00099	U	0.0011	U
METHYL ACETATE	NE	78000	78200		0.012	U	0.013	U	0.012	U	0.013	U	0.012	U	0.013	U	0.012	U	0.013	U	0.011	U	0.012	U
METHYL ETHYL KETONE	NE	28000	37100		0.0061	U	0.0062	U	0.0058	U	0.0065	U	0.0061	U	0.0066	U	0.0061	U	0.0063	U	0.0055	U	0.0059	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0055	U	0.0056	U	0.0052	U	0.0058	U	0.0055	U	0.0059	U	0.0055	U	0.0057	U	0.0049	U	0.0053	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0013	U	0.0013	U	0.0012	U	0.0014	U	0.0013	U	0.0014	U	0.0013	U	0.0013	U	0.0012	U	0.0013	U
METHYLENE CHLORIDE	NE	56	409		0.0046	U	0.0047	U	0.0044	U	0.0049	U	0.0046	U	0.005	U	0.0046	U	0.0047	U	0.0041	U	0.0044	U

Table 4-1
Soil Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC538-IS-0001-062912		OTC538-IS-0002-062912		OTC538-IS-0003-062912-FD		OTC538-IS-0004-062912		OTC538-IS-0005-062912		OTC538-IS-0006-062912		OTC538-IS-0007-062912		OTC538-IS-0008-062912		OTC538-IS-0009-062912		OTC538-IS-0010-062912	
				Sample Date	6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location	STA 1		STA 1		STA 1		STA 2		STA 2		STA 3		STA 3		MW-01 (STA 4)		MW-01 (STA 4)		MW-01 (STA 4)	
				Depth (ft bgs)	3 - 5		10 - 12		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																								
STYRENE	NE	6300	7280		0.0026	U	0.0026	U	0.0025	U	0.0028	U	0.0026	U	0.0028	U	0.0026	U	0.0027	U	0.0023	U	0.0025	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.002	U	0.002	U	0.0019	U	0.0021	U	0.002	U	0.0022	U	0.002	U	0.0021	U	0.0018	U	0.0019	U
TETRACHLOROETHYLENE	NE	22	7.02		0.00099	U	0.001	U	0.00095	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.0009	U	0.00096	U
TOLUENE	NE	5000	5270		0.0012	U	0.0012	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0015	U	0.0015	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U	0.0014	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0011	U	0.0011	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00099	U	0.0011	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0012	U	0.0012	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.002	U	0.002	U	0.0019	U	0.0021	U	0.002	U	0.0022	U	0.002	U	0.0021	U	0.0018	U	0.0019	U
VINYL CHLORIDE	NE	0.06	0.728		0.0015	U	0.0015	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U	0.0014	U
XYLENES, TOTAL	NE	630	814		0.0032	U	0.0032	U	0.003	U	0.0034	U	0.0032	U	0.0034	U	0.0032	U	0.0033	U	0.0029	U	0.0031	U
SEMIVOLATILES (mg/kg)																								
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
2,4-DICHLOROPHENOL	NE	180	183		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.025	U	0.024	U	0.024	U	0.023	U	0.023	U	0.024	U	0.023	U	0.024	U	0.023	U	0.024	U
2,4-DINITROPHENOL	NE	120	122		0.4	U	0.38	U	0.37	U	0.37	U	0.37	U	0.38	U	0.37	U	0.39	U	0.37	U	0.38	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
2,6-DINITROTOLUENE	NE	61	61.1		0.024	U	0.022	U	0.022	U	0.022	U	0.022	U	0.022	U	0.022	U	0.023	U	0.022	U	0.022	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
2-CHLOROPHENOL	NE	390	391		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
2-METHYLNAPHTHALENE	NE	230	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
2-METHYLPHENOL	NE	3100	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
2-NITROANILINE	NE	610	NE		0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
2-NITROPHENOL	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
3-NITROANILINE	NE	NE	NE		0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.08	U	0.075	U	0.075	U	0.074	U	0.074	U	0.076	U	0.074	U	0.077	U	0.074	U	0.076	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
4-CHLOROANILINE	NE	2.4	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
4-NITROANILINE	NE	24	NE		0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
4-NITROPHENOL	NE	NE	NE		0.16	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
ACENAPHTHENE	NE	3400	3440		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
ACENAPHTHYLENE	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
ACETOPHENONE	NE	7800	7820		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
ANTHRACENE	NE	17000	17200		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
ATRAZINE	NE	2.1	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U

Table 4-1
Soil Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC538-IS-0001-062912		OTC538-IS-0002-062912		OTC538-IS-0003-062912-FD		OTC538-IS-0004-062912		OTC538-IS-0005-062912		OTC538-IS-0006-062912		OTC538-IS-0007-062912		OTC538-IS-0008-062912		OTC538-IS-0009-062912		OTC538-IS-0010-062912	
				Sample Date	6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location	STA 1		STA 1		STA 1		STA 2		STA 2		STA 3		STA 3		MW-01 (STA 4)		MW-01 (STA 4)		MW-01 (STA 4)	
				Depth (ft bgs)	3 - 5		10 - 12		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																								
BENZALDEHYDE	NE	7800	NE	0.2	U	0.19	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZO(A)PYRENE	NE	0.015	0.148	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
BIPHENYL	NE	51	57.1	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.08	U	0.075	U	0.075	U	0.074	U	0.074	U	0.076	U	0.074	U	0.077	U	0.074	U	0.076	U
CAPROLACTAM	NE	31000	NE	0.064	U	0.06	U	0.06	U	0.059	U	0.059	U	0.061	U	0.059	U	0.062	U	0.06	U	0.061	U
CARBAZOLE	NE	NE	NE	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
CHRYSENE	NE	15	148	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
DIBENZOFURAN	NE	78	NE	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
DIETHYL PHTHALATE	NE	49000	48900	0.08	U	0.075	U	0.075	U	0.074	U	0.074	U	0.076	U	0.074	U	0.077	U	0.074	U	0.076	U
DIMETHYL PHTHALATE	NE	611000	611000	0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.08	U	0.075	U	0.075	U	0.074	U	0.074	U	0.076	U	0.074	U	0.077	U	0.074	U	0.076	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
FLUORANTHENE	NE	2300	2290	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
FLUORENE	NE	2300	2290	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.088	U	0.083	U	0.082	U	0.081	U	0.081	U	0.084	U	0.082	U	0.085	U	0.082	U	0.084	U
HEXACHLOROETHANE	NE	12	42.8	0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
ISOPHORONE	NE	510	5120	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
M,P-CRESOL	NE	NE	NE	0.029	U	0.027	U	0.027	U	0.027	U	0.027	U	0.027	U	0.027	U	0.028	U	0.027	U	0.027	U
NAPHTHALENE	NE	3.6	43.0	0.032	U	0.03	U	0.03	U	0.029	U	0.03	U	0.03	U	0.03	U	0.031	U	0.03	U	0.03	U
NITROBENZENE	NE	4.8	53.5	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.24	U	0.23	U	0.22	U	0.22	U	0.22	U	0.23	U	0.22	U	0.23	U	0.22	U	0.23	U
PHENANTHRENE	NE	1830	1830	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
PHENOL	NE	18000	18300	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
PYRENE	NE	1700	1720	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U

Table 4-1
Soil Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC538-IS-0001-062912		OTC538-IS-0002-062912		OTC538-IS-0003-062912-FD		OTC538-IS-0004-062912		OTC538-IS-0005-062912		OTC538-IS-0006-062912		OTC538-IS-0007-062912		OTC538-IS-0008-062912		OTC538-IS-0009-062912		OTC538-IS-0010-062912	
				Sample Date	6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location	STA 1		STA 1		STA 1		STA 2		STA 2		STA 3		STA 3		MW-01 (STA 4)		MW-01 (STA 4)		MW-01 (STA 4)	
				Depth (ft bgs)	3 - 5		10 - 12		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																								
1,3,5-TRINITROBENZENE	NE	2200.0	NE		0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U
1,3-DINITROBENZENE	NE	6.10	NE		0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1		0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U
2,4-DINITROTOLUENE	NE	1.60	15.7		0.089	U	0.09	U	0.091	U	0.085	U	0.082	U	0.078	U	0.088	U	0.096	U	0.085	U	0.079	U
2,6-DINITROTOLUENE	NE	61.0	61.1		0.08	U	0.081	U	0.082	U	0.076	U	0.073	U	0.07	U	0.079	U	0.086	U	0.077	U	0.071	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE		0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U
2-NITROTOLUENE	NE	2.90	29.1		0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U
3-NITROTOLUENE	NE	6.10	7.82		0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE		0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U
4-NITROTOLUENE	NE	30.0	244.4		0.093	U	0.094	U	0.095	U	0.089	U	0.085	U	0.081	U	0.092	U	0.1	U	0.089	U	0.082	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2		0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U
NITROBENZENE	NE	4.80	53.5		0.086	U	0.086	U	0.087	U	0.082	U	0.078	U	0.075	U	0.085	U	0.092	U	0.082	U	0.076	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7		0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U
TETRYL	NE	240.0	244.0		0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U
PCBS (mg/kg)																								
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93		0.0081	U	0.0074	U	0.0075	U	0.0073	UJ	0.0075	U	0.0076	U	0.0074	U	0.0077	U	0.0074	U	0.0075	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49		0.01	U	0.0093	U	0.0094	U	0.0091	U	0.0094	U	0.0094	U	0.0092	U	0.0096	U	0.0093	U	0.0094	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49		0.01	U	0.0093	U	0.0094	U	0.0091	U	0.0094	U	0.0094	U	0.0092	U	0.0096	U	0.0093	U	0.0094	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22		0.0081	U	0.0074	U	0.0075	U	0.0073	U	0.0075	U	0.0076	U	0.0074	U	0.0077	U	0.0074	U	0.0075	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22		0.0081	U	0.0074	U	0.0075	U	0.0073	U	0.0075	U	0.0076	U	0.0074	U	0.0077	U	0.0074	U	0.0075	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12		0.0081	U	0.0074	U	0.0075	U	0.0073	U	0.0075	U	0.0076	U	0.0074	U	0.0077	U	0.0074	U	0.0075	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22		0.0081	U	0.0074	U	0.0075	U	0.0073	UJ	0.0075	U	0.0076	U	0.0074	U	0.0077	U	0.0074	U	0.0075	U
METALS (mg/kg)																								
ALUMINUM	13722	77000	78000		1590		5810		5290		8990		8000		4140		4480		6200		5910		6110	
ANTIMONY	1.6	31	31.3		1.9	U	0.83	U	0.97	U	0.7	U	1.5	U	0.82	U	0.89	U	1.1	U	0.79	U	0.95	U
ARSENIC	3.7	0.39	3.90		0.97	U	1.1	J	0.97	U	2.2	J	1.9	J	1	J	0.89	U	1.1	J	1.1	J	1.8	J
BARIUM	169.3	15000	15600		21.2	J	44.7	J	41.2	J	71.9		87.1		33.4	J	36.4	J	54.5	J	47.6	J	108	
BERYLLIUM	1.6	160	156		0.48	U	0.42	U	0.48	U	0.41	J	0.5	J	0.41	U	0.44	U	0.55	U	0.39	U	0.47	U
CADMIUM	0.3	70	70.3		0.97	U	0.42	U	0.48	U	0.35	U	0.76	U	0.41	U	0.44	U	0.55	U	0.39	U	0.47	U
CALCIUM	317332	NE	NE		258000		206000		190000		169000		192000		171000		155000		234000		179000		181000	
CHROMIUM[d]	25	117000	117000		1.3	J	6.5		5.9		8.2		10.2		3.7	J	5		5.4	J	6.4		4.8	
COBALT	7.7	23	NE		1.1	J	2.2	J	1.9	J	3	J	3.1	J	1.4	J	1.6	J	1.9	J	1.9	J	1.8	J
COPPER	13	3100	3130		1.2	J	3.3	J	3.2	J	7.4	J	5.9	J	3	J	2.7	J	3.3	J	3.3	J	4.1	J
IRON	23049	55000	54800		1320		6050		5520		8010		9200		3590		4570		5250		5850		4850	
LEAD	10.9	400	400		0.97	U	3	J	2.6	J	80.4		5.3	J	2.3	J	4.5	J	2.3	J	2.9	J	2.9	J
MAGNESIUM	16991	NE	NE		2940		3150		2810		5820		4400		2790		2110	J	1950	J	2950		2500	
MANGANESE	393	1800	1860		29.1		79.6		73.3		187		208		84.9		76.2		108		94.2		76.3	
MERCURY	0.0108	10	15.6		0.0095	U	0.0087	U	0.009	U	0.0086	U	0.0086	U	0.0089	U	0.0087	U	0.0088	U	0.0091	U	0.009	U
NICKEL	17.4	1500	1560		1.8	J	4.9	J	4.3	J	6.6	J	8.5	J	3.3	J	3.9	J	4.4	J	4.8	J	4.2	J
POTASSIUM	5077	NE	NE		450	J	1390	J	1280	J	2290	J	1540	J	1040	J	983	J	1440	J	1300	J	1270	J

Table 4-1
Soil Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC538-IS-0001-062912		OTC538-IS-0002-062912		OTC538-IS-0003-062912-FD		OTC538-IS-0004-062912		OTC538-IS-0005-062912		OTC538-IS-0006-062912		OTC538-IS-0007-062912		OTC538-IS-0008-062912		OTC538-IS-0009-062912		OTC538-IS-0010-062912	
				Sample Date	6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location	STA 1		STA 1		STA 1		STA 2		STA 2		STA 3		STA 3		MW-01 (STA 4)		MW-01 (STA 4)		MW-01 (STA 4)	
				Depth (ft bgs)	3 - 5		10 - 12		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
METALS (mg/kg)																								
SELENIUM	1.4	390	391		3.9	U	1.7	U	1.9	U	1.4	U	3.1	U	1.6	U	1.8	U	2.2	U	1.6	U	1.9	U
SILVER	1.1	390	391		0.48	U	0.42	U	0.48	U	0.35	U	0.38	U	0.41	U	0.44	U	0.55	U	0.39	U	0.47	U
SODIUM	5196	NE	NE		1020	J	962	J	956	J	390	U	420	U	454	J	490	U	600	U	460	J	747	J
THALLIUM	1.3	0.78	0.782		2.5	U	1.1	U	1.3	U	0.92	U	2	U	1.1	U	1.2	U	1.4	U	1	U	1.2	U
VANADIUM	42.6	390	391		6.6	J	11.1	J	10.2	J	14.3	J	18.1	J	7.6	J	8.2	J	12.5	J	10.1	J	10.3	J
ZINC	54.6	23000	23500		4.8	U	17.2		14		42.7		22.9		11.8		12.7		16.8		15.4		14.2	
PETROLEUM HYDROCARBONS (mg/kg)																								
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000		3.1	U	3.1	U	3	U	2.9	U	2.6	U	2.9	U	2.6	U	3.2	U	2.9	U	2.7	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000		4.1	U	3.8	U	3.8	U	3.7	U	3.7	U	3.8	U	3.7	U	3.8	U	3.7	U	3.7	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000		4.1	U	3.8	U	3.8	U	8.39	J	3.7	U	3.8	U	3.7	U	3.8	U	3.7	U	3.7	U
CYANIDE (mg/kg)																								
CYANIDE	NE	22.0	46.9		0.073	U	0.068	U	0.067	U	0.066	U	0.065	U	0.067	U	0.064	U	0.068	U	0.064	U	0.064	U
TRITIUM (pCi/g)																								
TRITIUM	NE	NE	NE		4.88	U	4.77	U	4.78	U	4.79	U	4.94	U	4.86	U	4.88	U	4.81	U	4.68	U	4.84	U

Table 4-1
Soil Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC538-IS-0011-062912		OTC538-IS-0012-110612	
				Sample Date	6/29/2012		11/6/2012	
				Location	MW-01 (STA 4)		MW-01 (STA 4) Confirmation	
				Depth (ft bgs)	25 - 27		25 - 27	
				Result	VQ		Result	VQ
PERCENT SOLIDS	NE	NE	NE	**86.3**			**89.9**	
VOLATILES (mg/kg)								
1,1,1-TRICHLOROETHANE	NE	8700	15600	0.00095	U		NA	
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02	0.001	U		NA	
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100	0.0015	U		NA	
1,1,2-TRICHLOROETHANE	NE	1.1	2.81	0.00095	U		NA	
1,1-DICHLOROETHANE	NE	3.3	64.5	0.00095	U		NA	
1,1-DICHLOROETHENE	NE	240	449	0.0012	U		NA	
1,2,4-TRICHLOROBENZENE	NE	22	73.0	0.001	U		NA	
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86	0.002	U		NA	
1,2-DIBROMOETHANE	NE	0.034	0.588	0.00086	U		NA	
1,2-DICHLOROBENZENE	NE	1900	2310	0.00095	U		NA	
1,2-DICHLOROETHANE	NE	0.43	7.89	0.00086	U		NA	
1,2-DICHLOROPROPANE	NE	0.94	15.2	0.001	U		NA	
1,3-DICHLOROBENZENE	NE	NE	NE	0.001	U		NA	
1,4-DICHLOROBENZENE	NE	2.4	31.7	0.00095	U		NA	
2-HEXANONE	NE	210	NE	0.0046	U		NA	
ACETONE	NE	61000	66600	0.017	U		NA	
BENZENE	NE	1.1	15.4	0.0013	U		NA	
BROMODICHLOROMETHANE	NE	0.27	5.41	0.00095	U		NA	
BROMOFORM	NE	62	616	0.0013	U		NA	
BROMOMETHANE	NE	7.3	16.5	0.0017	U		NA	
CARBON DISULFIDE	NE	820	1530	0.0017	U		NA	
CARBON TETRACHLORIDE	NE	0.61	10.8	0.0015	U		NA	
CHLOROBENZENE	NE	290	376	0.00086	U		NA	
CHLOROETHANE	NE	15000	29800	0.0017	U		NA	
CHLOROFORM	NE	0.29	5.86	0.001	U		NA	
CHLOROMETHANE	NE	120	275	0.0017	U		NA	
CIS-1,2-DICHLOROETHYLENE	NE	160	156	0.0013	U		NA	
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	0.00086	U		NA	
CYCLOHEXANE	NE	7000	NE	0.0012	U		NA	
DIBROMOCHLOROMETHANE	NE	0.68	12.1	0.00086	U		NA	
DICHLORODIFLUOROMETHANE	NE	94	168	0.0013	U		NA	
ETHYLBENZENE	NE	5.4	68.4	0.00086	U		NA	
ISOPROPYLBENZENE	NE	2100	2430	0.00095	U		NA	
METHYL ACETATE	NE	78000	78200	0.011	U		NA	
METHYL ETHYL KETONE	NE	28000	37100	0.0052	U		NA	
METHYL ISOBUTYL KETONE	NE	5300	5820	0.0047	U		NA	
METHYLCYCLOHEXANE	NE	5630	5630	0.0011	U		NA	
METHYLENE CHLORIDE	NE	56	409	0.004	U		NA	

Table 4-1
Soil Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC538-IS-0011-062912		OTC538-IS-0012-110612	
				Sample Date	6/29/2012		11/6/2012	
				Location	MW-01 (STA 4)		MW-01 (STA 4) Confirmation	
				Depth (ft bgs)	25 - 27		25 - 27	
					Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)								
STYRENE	NE	6300	7280	0.0022	U	NA		
TERT-BUTYL METHYL ETHER	NE	43	901	0.0017	U	NA		
TETRACHLOROETHYLENE	NE	22	7.02	0.00086	U	NA		
TOLUENE	NE	5000	5270	0.001	U	NA		
TRANS-1,2-DICHLOROETHENE	NE	150	270	0.0013	U	NA		
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.00095	U	NA		
TRICHLOROETHYLENE	NE	0.91	8.77	0.001	U	NA		
TRICHLOROFLUOROMETHANE	NE	790	1410	0.0017	U	NA		
VINYL CHLORIDE	NE	0.06	0.728	0.0013	U	NA		
XYLENES, TOTAL	NE	630	814	0.0028	U	NA		
SEMIVOLATILES (mg/kg)								
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	0.019	U	NA		
2,4,5-TRICHLOROPHENOL	NE	6100	6110	0.019	U	NA		
2,4,6-TRICHLOROPHENOL	NE	44	61.1	0.019	U	NA		
2,4-DICHLOROPHENOL	NE	180	183	0.019	U	NA		
2,4-DIMETHYLPHENOL	NE	1200	1220	0.024	U	NA		
2,4-DINITROPHENOL	NE	120	122	0.39	U	NA		
2,4-DINITROTOLUENE	NE	1.6	15.7	0.019	U	NA		
2,6-DINITROTOLUENE	NE	61	61.1	0.023	U	NA		
2-CHLORONAPHTHALENE	NE	6300	6260	0.039	U	NA		
2-CHLOROPHENOL	NE	390	391	0.019	U	NA		
2-METHYLNAPHTHALENE	NE	230	NE	0.019	U	NA		
2-METHYLPHENOL	NE	3100	NE	0.019	U	NA		
2-NITROANILINE	NE	610	NE	0.039	U	NA		
2-NITROPHENOL	NE	NE	NE	0.019	U	NA		
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	0.039	U	NA		
3-NITROANILINE	NE	NE	NE	0.039	U	NA		
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	0.078	U	NA		
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.019	U	NA		
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	0.019	U	NA		
4-CHLOROANILINE	NE	2.4	NE	0.019	U	NA		
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.019	U	NA		
4-NITROANILINE	NE	24	NE	0.039	U	NA		
4-NITROPHENOL	NE	NE	NE	0.16	U	NA		
ACENAPHTHENE	NE	3400	3440	0.019	U	NA		
ACENAPHTHYLENE	NE	NE	NE	0.019	U	NA		
ACETOPHENONE	NE	7800	7820	0.019	U	NA		
ANTHRACENE	NE	17000	17200	0.019	U	NA		
ATRAZINE	NE	2.1	NE	0.019	U	NA		

Table 4-1
Soil Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC538-IS-0011-062912		OTC538-IS-0012-110612	
				Sample Date	6/29/2012		11/6/2012	
				Location	MW-01 (STA 4)		MW-01 (STA 4) Confirmation	
				Depth (ft bgs)	25 - 27		25 - 27	
					Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)								
BENZALDEHYDE	NE	7800	NE	0.19	U	NA		
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.019	U	NA		
BENZO(A)PYRENE	NE	0.015	0.148	0.019	U	NA		
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.019	U	NA		
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.019	U	NA		
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.019	U	NA		
BENZYL BUTYL PHTHALATE	NE	260	NE	0.039	U	NA		
BIPHENYL	NE	51	57.1	0.019	U	NA		
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.019	U	NA		
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.019	U	NA		
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.078	U	NA		
CAPROLACTAM	NE	31000	NE	0.062	U	NA		
CARBAZOLE	NE	NE	NE	0.019	U	NA		
CHRYSENE	NE	15	148	0.019	U	NA		
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.019	U	NA		
DIBENZOFURAN	NE	78	NE	0.019	U	NA		
DIETHYL PHTHALATE	NE	49000	48900	0.078	U	NA		
DIMETHYL PHTHALATE	NE	611000	611000	0.039	U	NA		
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.078	U	NA		
DI-N-OCTYLPHTHALATE	NE	730	NE	0.039	U	NA		
FLUORANTHENE	NE	2300	2290	0.019	U	NA		
FLUORENE	NE	2300	2290	0.019	U	NA		
HEXACHLOROBENZENE	NE	0.3	3.04	0.019	U	NA		
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.039	U	NA		
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.085	U	NA		
HEXACHLOROETHANE	NE	12	42.8	0.039	U	NA		
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.019	U	NA		
ISOPHORONE	NE	510	5120	0.019	U	NA		
M,P-CRESOL	NE	NE	NE	0.028	U	NA		
NAPHTHALENE	NE	3.6	43.0	0.031	U	NA		
NITROBENZENE	NE	4.8	53.5	0.019	U	NA		
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.019	U	NA		
N-NITROSODIPHENYLAMINE	NE	99	993	0.019	U	NA		
PENTACHLOROPHENOL	NE	0.89	8.94	0.23	U	NA		
PHENANTHRENE	NE	1830	1830	0.019	U	NA		
PHENOL	NE	18000	18300	0.019	U	NA		
PYRENE	NE	1700	1720	0.019	U	NA		

Table 4-1
Soil Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC538-IS-0011-062912		OTC538-IS-0012-110612	
				Sample Date	6/29/2012		11/6/2012	
				Location	MW-01 (STA 4)		MW-01 (STA 4) Confirmation	
				Depth (ft bgs)	25 - 27		25 - 27	
					Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)								
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.062	U	NA		
1,3-DINITROBENZENE	NE	6.10	NE	0.062	U	NA		
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.062	U	NA		
2,4-DINITROTOLUENE	NE	1.60	15.7	0.075	U	NA		
2,6-DINITROTOLUENE	NE	61.0	61.1	0.068	U	NA		
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.062	U	NA		
2-NITROTOLUENE	NE	2.90	29.1	0.062	U	NA		
3-NITROTOLUENE	NE	6.10	7.82	0.062	U	NA		
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.062	U	NA		
4-NITROTOLUENE	NE	30.0	244.4	0.079	U	NA		
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.062	U	NA		
NITROBENZENE	NE	4.80	53.5	0.072	U	NA		
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.062	U	NA		
TETRYL	NE	240.0	244.0	0.062	U	NA		
PCBS (mg/kg)								
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0078	U	NA		
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.0098	U	NA		
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.0098	U	NA		
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0078	U	NA		
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0078	U	NA		
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0078	U	NA		
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0078	U	NA		
METALS (mg/kg)								
ALUMINUM	13722	77000	78000	3840		NA		
ANTIMONY	1.6	31	31.3	0.98	U	NA		
ARSENIC	3.7	0.39	3.90	19.2		8.1		
BARIUM	169.3	15000	15600	32.4	J	NA		
BERYLLIUM	1.6	160	156	0.49	U	NA		
CADMIUM	0.3	70	70.3	0.49	U	NA		
CALCIUM	317332	NE	NE	117000		NA		
CHROMIUM[d]	25	117000	117000	6.6		NA		
COBALT	7.7	23	NE	2.9	J	NA		
COPPER	13	3100	3130	4.7	J	NA		
IRON	23049	55000	54800	11800		7020		
LEAD	10.9	400	400	3.2	J	NA		
MAGNESIUM	16991	NE	NE	2380	J	NA		
MANGANESE	393	1800	1860	162		NA		
MERCURY	0.0108	10	15.6	0.0093	U	NA		
NICKEL	17.4	1500	1560	5.7	J	NA		
POTASSIUM	5077	NE	NE	791	J	NA		

Table 4-1
Soil Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC538-IS-0011-062912		OTC538-IS-0012-110612	
			Sample Date	6/29/2012		11/6/2012	
			Location	MW-01 (STA 4)		MW-01 (STA 4) Confirmation	
			Depth (ft bgs)	25 - 27		25 - 27	
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Result	VQ	Result	VQ
METALS (mg/kg)							
SELENIUM	1.4	390	391	2	U	NA	
SILVER	1.1	390	391	0.49	U	NA	
SODIUM	5196	NE	NE	656	J	NA	
THALLIUM	1.3	0.78	0.782	1.3	U	NA	
VANADIUM	42.6	390	391	45.8		NA	
ZINC	54.6	23000	23500	15.3		NA	
PETROLEUM HYDROCARBONS (mg/kg)							
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	2.2	U	NA	
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	3.8	U	NA	
OIL RANGE ORGANICS C28-C40	NE	NE	1000	3.8	U	NA	
CYANIDE (mg/kg)							
CYANIDE	NE	22.0	46.9	0.14	U	NA	
TRITIUM (pCi/g)							
TRITIUM	NE	NE	NE	4.84	U	NA	

Table 4-1
Soil Analytical Data
Buidling 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil

Value exceeds EPA RSL - Residential Soil

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Table 4-2
Groundwater Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC538-GW-5381-071212	
			Sample date	7/12/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NM WQCC WQS (µg/L)[c]	Result	VQ
TOTAL DISSOLVED SOLIDS (mg/L)	NE	NE	10,000	12,600	
VOLATILES (µg/L)					
1,1,1-TRICHLOROETHANE	NE	200	60	NA	
1,1,2,2-TETRACHLOROETHANE	NE	NE	10	NA	
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	NE	NE	NA	
1,1,2-TRICHLOROETHANE	NE	5	10	NA	
1,1-DICHLOROETHANE	NE	NE	25	NA	
1,1-DICHLOROETHENE	NE	7	5	NA	
1,2,4-TRICHLOROBENZENE	NE	70	NE	NA	
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.20	NE	NA	
1,2-DIBROMOETHANE	NE	0.05	0.10	NA	
1,2-DICHLOROBENZENE	NE	600	NE	NA	
1,2-DICHLOROETHANE	NE	5	10	NA	
1,2-DICHLOROPROPANE	NE	5	NE	NA	
1,3-DICHLOROBENZENE	NE	NE	NE	NA	
1,4-DICHLOROBENZENE	NE	75	NE	NA	
2-HEXANONE	NE	NE	NE	NA	
ACETONE	NE	NE	NE	NA	
BENZENE	NE	5	10	NA	
BROMODICHLOROMETHANE	NE	80	NE	NA	
BROMOFORM	NE	80	NE	NA	
BROMOMETHANE	NE	NE	NE	NA	
CARBON DISULFIDE	NE	NE	NE	NA	
CARBON TETRACHLORIDE	NE	5	10	NA	
CHLOROBENZENE	NE	100	NE	NA	
CHLOROETHANE	NE	NE	NE	NA	
CHLOROFORM	NE	80	100	NA	
VOLATILES - continued (µg/L)					
CHLOROMETHANE	NE	NE	NE	NA	
CIS-1,2-DICHLOROETHYLENE	NE	70	NE	NA	
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	NA	
CYCLOHEXANE	NE	NE	NE	NA	
DIBROMOCHLOROMETHANE	NE	80	NE	NA	
DICHLORODIFLUOROMETHANE	NE	NE	NE	NA	

Table 4-2
Groundwater Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC538-GW-5381-071212	
			Sample date	7/12/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NM WQCC WQS (µg/L)[c]**	Result	VQ
ETHYLBENZENE	NE	700	750	NA	
ISOPROPYLBENZENE	NE	NE	NE	NA	
METHYL ACETATE	NE	NE	NE	NA	
METHYL ETHYL KETONE	NE	NE	NE	NA	
METHYL ISOBUTYL KETONE	NE	NE	NE	NA	
METHYLCYCLOHEXANE	NE	NE	NE	NA	
METHYLENE CHLORIDE	NE	5	100	NA	
STYRENE	NE	100	NE	NA	
TERT-BUTYL METHYL ETHER	NE	NE	NE	NA	
TETRACHLOROETHYLENE	NE	5	20	NA	
TOLUENE	NE	1000	750	NA	
TRANS-1,2-DICHLOROETHENE	NE	100	NE	NA	
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	NA	
TRICHLOROETHYLENE	NE	5	100	NA	
TRICHLOROFLUOROMETHANE	NE	NE	NE	NA	
VINYL CHLORIDE	NE	2	1	NA	
XYLENES, TOTAL	NE	10000	620	NA	
SEMIVOLATILES (µg/L)					
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	NA	
2,4,5-TRICHLOROPHENOL	NE	NE	NE	NA	
2,4,6-TRICHLOROPHENOL	NE	NE	NE	NA	
2,4-DICHLOROPHENOL	NE	NE	NE	NA	
2,4-DIMETHYLPHENOL	NE	NE	NE	NA	
2,4-DINITROPHENOL	NE	NE	NE	NA	
2,4-DINITROTOLUENE	NE	NE	NE	NA	
2,6-DINITROTOLUENE	NE	NE	NE	NA	
2-CHLORONAPHTHALENE	NE	NE	30	NA	
2-CHLOROPHENOL	NE	NE	NE	NA	
2-METHYLNAPHTHALENE	NE	NE	30	NA	
2-METHYLPHENOL	NE	NE	NE	NA	
2-NITROANILINE	NE	NE	NE	NA	
2-NITROPHENOL	NE	NE	NE	NA	
3,3'-DICHLOROBENZIDINE	NE	NE	NE	NA	
3-NITROANILINE	NE	NE	NE	NA	
4,6-DINITRO-2-METHYLPHENOL	NE	NE	NE	NA	
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	NA	

Table 4-2
Groundwater Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC538-GW-5381-071212	
			Sample date	7/12/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NM WQCC WQS (µg/L)[c]	Result	VQ
4-CHLORO-3-METHYLPHENOL	NE	NE	NE	NA	
4-CHLOROANILINE	NE	NE	NE	NA	
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	NA	
4-NITROANILINE	NE	NE	NE	NA	
4-NITROPHENOL	NE	NE	NE	NA	
ACENAPHTHENE	NE	NE	30	NA	
ACENAPHTHYLENE	NE	NE	30	NA	
ACETOPHENONE	NE	NE	NE	NA	
ANTHRACENE	NE	NE	30	NA	
SEMIVOLATILES - continued (µg/L)					
ATRAZINE	NE	3	NE	NA	
BENZALDEHYDE	NE	NE	NE	NA	
BENZO(A)ANTHRACENE	NE	NE	30	NA	
BENZO(A)PYRENE	NE	0.20	0.7	NA	
BENZO(B)FLUORANTHENE	NE	NE	30	NA	
BENZO(G,H,I)PERYLENE	NE	NE	30	NA	
BENZO(K)FLUORANTHENE	NE	NE	30	NA	
BENZYL BUTYL PHTHALATE	NE	NE	NE	NA	
BIPHENYL	NE	NE	NE	NA	
BIS(2-CHLOROETHOXY) METHANE	NE	NE	NE	NA	
BIS(2-CHLOROETHYL) ETHER	NE	NE	NE	NA	
BIS(2-ETHYLHEXYL) PHTHALATE	NE	6	NE	NA	
CAPROLACTAM	NE	NE	NE	NA	
CARBAZOLE	NE	NE	NE	NA	
CHRYSENE	NE	NE	30	NA	
DIBENZ(A,H)ANTHRACENE	NE	NE	30	NA	
DIBENZOFURAN	NE	NE	NE	NA	
DIETHYL PHTHALATE	NE	NE	NE	NA	
DIMETHYL PHTHALATE	NE	NE	NE	NA	
DI-N-BUTYL PHTHALATE	NE	NE	NE	NA	
DI-N-OCTYLPHTHALATE	NE	NE	NE	NA	
FLUORANTHENE	NE	NE	30	NA	
FLUORENE	NE	NE	30	NA	
HEXACHLOROBENZENE	NE	1	NE	NA	
HEXACHLOROBUTADIENE	NE	NE	NE	NA	
HEXACHLOROCYCLOPENTADIENE	NE	50	NE	NA	

Table 4-2
Groundwater Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC538-GW-5381-071212	
			Sample date	7/12/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NM WQCC WQS (µg/L)[c]	Result	VQ
HEXACHLOROETHANE	NE	NE	NE	NA	
SEMIVOLATILES - continued (µg/L)					
INDENO(1,2,3-C,D)PYRENE	NE	NE	30	NA	
ISOPHORONE	NE	NE	NE	NA	
M,P-CRESOL	NE	NE	NE	NA	
NAPHTHALENE	NE	NE	30	NA	
NITROBENZENE	NE	NE	NE	NA	
N-NITROSODI-N-PROPYLAMINE	NE	NE	NE	NA	
N-NITROSODIPHENYLAMINE	NE	NE	NE	NA	
PENTACHLOROPHENOL	NE	1	NE	NA	
PHENANTHRENE	NE	NE	30	NA	
PHENOL	NE	NE	NE	NA	
PYRENE	NE	NE	30	NA	
EXPLOSIVES (µg/L)					
1,3,5-TRINITROBENZENE	NE	NE	NE	NA	
1,3-DINITROBENZENE	NE	NE	NE	NA	
2,4,6-TRINITROTOLUENE	NE	NE	NE	NA	
2,4-DINITROTOLUENE	NE	NE	NE	NA	
2,6-DINITROTOLUENE	NE	NE	NE	NA	
2-AMINO-4,6-DINITROTOLUENE	NE	NE	NE	NA	
2-NITROTOLUENE	NE	NE	NE	NA	
3-NITROTOLUENE	NE	NE	NE	NA	
4-AMINO-2,6-DINITROTOLUENE	NE	NE	NE	NA	
4-NITROTOLUENE	NE	NE	NE	NA	
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	NE	NE	NA	
NITROBENZENE	NE	NE	NE	NA	
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	NE	NE	NA	
TETRYL	NE	NE	NE	NA	
METALS (µg/L)					
ALUMINUM	1043	NE	NE	NA	
ANTIMONY	6	6	NE	NA	
ARSENIC	10	10	100	NA	
BARIUM	38	2000	1000	NA	
BERYLLIUM	4	4	NE	NA	
CADMIUM	5	5	10	NA	
CALCIUM	1,136,664	NE	NE	NA	

Table 4-2
Groundwater Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC538-GW-5381-071212	
			Sample date	7/12/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NM WQCC WQS (µg/L)[c]**	Result	VQ
CHROMIUM, TOTAL	12	100	50	NA	
COBALT	36	NE	NE	NA	
COPPER	9.8	1300	1000	NA	
IRON	300	NE	1000	NA	
LEAD	9	15	50	NA	
MAGNESIUM	3,692,782	NE	NE	NA	
MANGANESE	50	NE	200	NA	
MERCURY	0.5	2	2	NA	
NICKEL	22	NE	NE	NA	
POTASSIUM	212,144	NE	NE	NA	
SELENIUM	50	50	50	NA	
SILVER	10	NE	50	NA	
SODIUM	20,989,580	NE	NE	NA	
THALLIUM	2	2	NE	NA	
VANADIUM	90	NE	NE	NA	
ZINC	17	NE	10000	NA	
PCBs (µg/L)					
PCB-1016 (AROCHLOR 1016)	NE	NE	1	NA	
PCB-1221 (AROCHLOR 1221)	NE	NE	1	NA	
PCB-1232 (AROCHLOR 1232)	NE	NE	1	NA	
PCB-1242 (AROCHLOR 1242)	NE	NE	1	NA	
PCB-1248 (AROCHLOR 1248)	NE	NE	1	NA	
PCB-1254 (AROCHLOR 1254)	NE	NE	1	NA	
PCB-1260 (AROCHLOR 1260)	NE	NE	1	NA	
PETROLEUM HYDROCARBONS (µg/L)					
GASOLINE RANGE ORGANICS C6-C10	NE	NE	See individual VOC & SVOC		
DIESEL RANGE ORGANICS C10-C28	NE	NE	400	NA	
OIL RANGE ORGANICS C28-C40	NE	NE	200	NA	
CYANIDE (µg/L)					
CYANIDE	NE	200	200	NA	
TRITIUM (pCi/L)					
TRITIUM	NE	NE	NE	NA	

Table 4-2
Groundwater Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NM WQCC Water Quality Standard

Value exceeds EPA Maximum Contaminant Level

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," letter to D. Scruggs, Chief, Environmental Restoration Program, Holloman Air Force Base from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, New Mexico Environment Department, March 1.*

[b] *U.S. Environmental Protection Agency (EPA), 2012, National Primary Drinking Water Regulations: List of Drinking Water Contaminants and Maximum Contaminant Levels.*

[c] *New Mexico Water Quality Control Commission, Water Quality Standards, 20.6.2 New Mexico Administrative Code.*

[d]New Mexico Environment Department (NMED), 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, New Mexico Environment Department, Santa Fe, New Mexico, February, Table 6-2. TPH Screening Guidelines for Potable Groundwater (GW-1), February 2012, Table A-1: NMED Soil Screening Levels, updated June 2012. "Unknown oil" criteria used for Oil Range Oraganics.

EPA = U.S. Environmental Protection Agency

GW = groundwater

J = estimated value

MCL = Maximum Contaminant Level

µg/L = micrograms per liter

mg/L = milligrams per liter

NA = not analyzed

NE = not established

NM WQCC= New Mexico Water Quality Control Commission

pCi/L = picocuries per liter

RFI = RCRA Facility Investigation

U = not detected at the detection limit shown

VQ = validation qualifier

WQS = Water Quality Standard

Table 4-3
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	LDY-IDW01-090412	
		Sample Date	9/4/2012	
		Sample Type	Waste	
		40 CFR 261 Waste Characteristic Criteria	Result	Lab Qual
General Chemistry				
Corrosivity as pH	pH Units	> 2 and < 12.5	**7.7**	
Cyanide Reactivity	mg/kg	< 250	1.5	U
Ignitability (Flashpoint)	°F	> 140 °F	>200	
Solids, Percent	%	-	**84.4**	
Sulfide Reactivity	mg/kg	< 500	59	U
TCLP Volatiles				
Benzene	mg/L	0.5	0.0020	U
Chlorobenzene	mg/L	100	0.0020	U
Chloroform	mg/L	6	0.0022	U
Carbon tetrachloride	mg/L	0.5	0.0025	U
1,1-Dichloroethylene	mg/L	0.7	0.0023	U
1,2-Dichloroethane	mg/L	0.5	0.0020	U
p-Dichlorobenzene	mg/L	7.5	0.0023	U
Methyl ethyl ketone	mg/L	200	0.0020	U
Tetrachloroethylene	mg/L	0.7	0.0025	U
Trichloroethylene	mg/L	0.5	0.0026	U
Vinyl chloride	mg/L	0.2	0.0022	U
TCLP Semivolatiles				
2-Methylphenol	mg/L	200	0.0054	U
3&4-Methylphenol	mg/L	200	0.011	U
Pentachlorophenol	mg/L	100	0.054	U
2,4,5-Trichlorophenol	mg/L	400	0.0050	U
2,4,6-Trichlorophenol	mg/L	2	0.0050	U
1,4-Dichlorobenzene	mg/L	7.5	0.010	U
2,4-Dinitrotoluene	mg/L	0.13	0.0050	U
Hexachlorobenzene	mg/L	0.13	0.0056	U
Hexachlorobutadiene	mg/L	0.5	0.010	U
Hexachloroethane	mg/L	3	0.010	U
Nitrobenzene	mg/L	2	0.0059	U
Pyridine	mg/L	100	0.016	U
TCLP Metals				
Arsenic	mg/L	5	0.020	U
Barium	mg/L	100	**0.12**	J
Cadmium	mg/L	1	0.010	U
Chromium	mg/L	5	0.010	U
Lead	mg/L	5	0.010	U
Mercury	mg/L	0.2	0.00050	U
Selenium	mg/L	1	0.020	U
Silver	mg/L	5	0.010	U

Table 4-3
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

°F = degrees Fahrenheit
> = greater than
< = less than
% = percent
CFR = Code of Federal Regulations
J = estimated value
Lab Qual = laboratory qualifier
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
TCLP = Toxicity Characteristic Leaching Procedure
U = not detected at the detection limit shown

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles				
Acetone	µg/L	NE	10	U
Benzene	µg/L	5	0.21	U
Bromodichloromethane	µg/L	80	0.20	U
Bromoform	µg/L	80	0.34	U
Chlorobenzene	µg/L	100	0.20	U
Chloroethane	µg/L	NE	0.50	U
Chloroform	µg/L	80	0.26	U
Carbon disulfide	µg/L	NE	0.49	U
Carbon tetrachloride	µg/L	5	0.31	U
Cyclohexane	µg/L	NE	0.48	U
1,1-Dichloroethane	µg/L	NE	0.21	U
1,1-Dichloroethylene	µg/L	7	0.20	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.71	U
1,2-Dibromoethane	µg/L	0.05	0.30	U
1,2-Dichloroethane	µg/L	5	0.22	U
1,2-Dichloropropane	µg/L	5	0.26	U
Dibromochloromethane	µg/L	80	0.20	U
Dichlorodifluoromethane	µg/L	NE	0.50	U
cis-1,2-Dichloroethylene	µg/L	70	**0.42**	J
cis-1,3-Dichloropropene	µg/L	NE	0.22	U
m-Dichlorobenzene	µg/L	NE	0.25	U
o-Dichlorobenzene	µg/L	600	0.22	U
p-Dichlorobenzene	µg/L	75	0.20	U
trans-1,2-Dichloroethylene	µg/L	100	0.23	U
trans-1,3-Dichloropropene	µg/L	NE	0.21	U
Ethylbenzene	µg/L	700	0.29	U
Freon 113	µg/L	NE	0.33	U
2-Hexanone	µg/L	NE	2.0	U
Isopropylbenzene	µg/L	NE	0.20	U
4-Methyl-2-pentanone	µg/L	NE	2.3	U
Methyl Acetate	µg/L	NE	5.0	U
Methyl bromide	µg/L	NE	0.79	U
Methyl chloride	µg/L	NE	0.50	U
Methylcyclohexane	µg/L	NE	0.20	U
Methylene chloride	µg/L	5	2.0	U
Methyl ethyl ketone	µg/L	NE	3.1	U
Methyl Tert Butyl Ether	µg/L	NE	0.21	U
Styrene	µg/L	100	0.20	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles (continued)				
1,1,1-Trichloroethane	µg/L	200	0.20	U
1,1,2,2-Tetrachloroethane	µg/L	NE	0.24	U
1,1,2-Trichloroethane	µg/L	5	0.20	U
1,2,4-Trichlorobenzene	µg/L	70	0.50	U
Tetrachloroethylene	µg/L	5	0.32	U
Toluene	µg/L	1000	0.20	U
Trichloroethylene	µg/L	5	0.31	U
Trichlorofluoromethane	µg/L	NE	0.50	U
Vinyl chloride	µg/L	2	0.44	U
Xylene (total)	µg/L	10000	0.50	U
Semivolatiles				
2-Chlorophenol	µg/L	NE	0.68	U
4-Chloro-3-methyl phenol	µg/L	NE	0.78	U
2,4-Dichlorophenol	µg/L	NE	0.67	U
2,4-Dimethylphenol	µg/L	NE	0.74	U
2,4-Dinitrophenol	µg/L	NE	5.0	U
4,6-Dinitro-o-cresol	µg/L	NE	1.4	U
2-Methylphenol	µg/L	NE	0.69	U
3&4-Methylphenol	µg/L	NE	1.3	U
2-Nitrophenol	µg/L	NE	0.65	U
4-Nitrophenol	µg/L	NE	4.8	U
Pentachlorophenol	µg/L	1	4.8	U
Phenol	µg/L	NE	0.53	U
2,4,5-Trichlorophenol	µg/L	NE	0.86	U
2,4,6-Trichlorophenol	µg/L	NE	0.75	U
Acenaphthene	µg/L	NE	0.67	U
Acenaphthylene	µg/L	NE	0.67	U
Acetophenone	µg/L	NE	0.72	U
Anthracene	µg/L	NE	0.72	U
Atrazine	µg/L	3	0.83	U
Benzaldehyde	µg/L	NE	4.8	U
Benzo(a)anthracene	µg/L	NE	0.52	U
Benzo(a)pyrene	µg/L	0.2	0.55	U
Benzo(b)fluoranthene	µg/L	NE	0.73	U
Benzo(g,h,i)perylene	µg/L	NE	0.64	U
Benzo(k)fluoranthene	µg/L	NE	0.64	U
4-Bromophenyl phenyl ether	µg/L	NE	0.76	U
Butyl benzyl phthalate	µg/L	NE	0.68	U
1,1'-Biphenyl	µg/L	NE	0.92	U
2-Chloronaphthalene	µg/L	NE	0.70	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Semivolatiles (continued)				
4-Chloroaniline	µg/L	NE	0.66	U
Caprolactam	µg/L	NE	2.4	U
Carbazole	µg/L	NE	0.50	U
Chrysene	µg/L	NE	0.56	U
bis(2-Chloroethoxy)methane	µg/L	NE	0.67	U
bis(2-Chloroethyl)ether	µg/L	NE	0.69	U
bis(2-Chloroisopropyl)ether	µg/L	NE	0.76	U
4-Chlorophenyl phenyl ether	µg/L	NE	0.84	U
2,4-Dinitrotoluene	µg/L	NE	0.66	U
2,6-Dinitrotoluene	µg/L	NE	0.77	U
3,3'-Dichlorobenzidine	µg/L	NE	0.71	U
Dibenzo(a,h)anthracene	µg/L	NE	0.56	U
Dibenzofuran	µg/L	NE	0.72	U
Di-n-butyl phthalate	µg/L	NE	0.96	U
Di-n-octyl phthalate	µg/L	NE	0.96	U
Diethyl phthalate	µg/L	NE	0.96	U
Dimethyl phthalate	µg/L	NE	0.77	U
bis(2-Ethylhexyl)phthalate	µg/L	6	1.1	U
Fluoranthene	µg/L	NE	0.56	U
Fluorene	µg/L	NE	0.73	U
Hexachlorobenzene	µg/L	1	0.66	U
Hexachlorobutadiene	µg/L	NE	0.92	U
Hexachlorocyclopentadiene	µg/L	50	0.76	U
Hexachloroethane	µg/L	NE	0.71	U
Indeno(1,2,3-cd)pyrene	µg/L	NE	0.55	U
Isophorone	µg/L	NE	0.61	U
2-Methylnaphthalene	µg/L	NE	0.66	U
2-Nitroaniline	µg/L	NE	0.72	U
3-Nitroaniline	µg/L	NE	0.62	U
4-Nitroaniline	µg/L	NE	0.93	U
Naphthalene	µg/L	NE	0.61	U
Nitrobenzene	µg/L	NE	0.69	U
N-Nitroso-di-n-propylamine	µg/L	NE	0.82	U
N-Nitrosodiphenylamine	µg/L	NE	0.96	U
Phenanthrene	µg/L	NE	0.68	U
Pyrene	µg/L	NE	0.65	U
Petroleum Hydrocarbons				
Gasoline Range Organics (C6-C10)	mg/L	NE	0.05	U
Diesel Range Organics (C10-C28)	mg/L	NE	**0.115**	J
Oil Range Organics (C28-C40)	mg/L	NE	0.10	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Metals				
Aluminum	µg/L	NE	**36.2**	J
Antimony	µg/L	6	**6.7**	J
Arsenic	µg/L	10	2.5	U
Barium	µg/L	2000	**29.1**	J
Beryllium	µg/L	4	0.50	U
Cadmium	µg/L	5	1.0	U
Calcium	µg/L	NE	**654,000**	
Chromium	µg/L	100	4	U
Cobalt	µg/L	NE	**6.2**	J
Copper	µg/L	1300	**2.9**	J
Iron	µg/L	NE	**97.5**	J
Lead	µg/L	15	2.2	U
Magnesium	µg/L	NE	**310,000**	
Manganese	µg/L	NE	**179**	
Mercury	µg/L	2	0.03	U
Nickel	µg/L	NE	**3.7**	J
Potassium	µg/L	NE	**16,500**	
Selenium	µg/L	50	4.0	U
Silver	µg/L	NE	0.50	U
Sodium	µg/L	NE	**762,000**	
Thallium	µg/L	2	0.078	U
Vanadium	µg/L	NE	**4.5**	J
Zinc	µg/L	NE	**12.8**	J

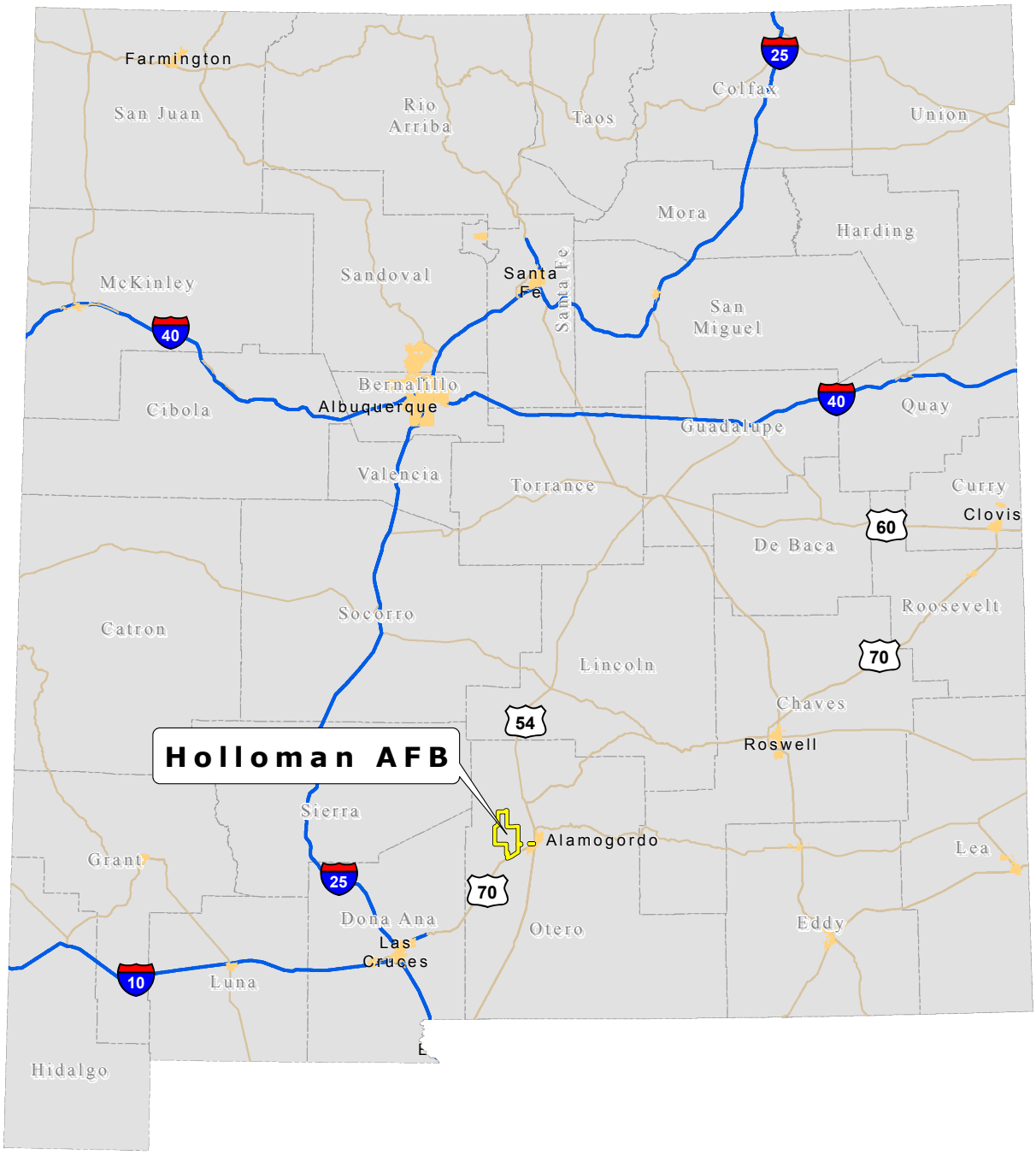
Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

[a] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

EPA = U.S. Environmental Protection Agency.
J = estimated value.
MCL = maximum contaminant level.
NE = not established
µg/L = micrograms per liter.
mg/L = milligrams per liter.
NE = not established
RSL = regional screening level.
U = not detected at the detection limit shown.
VQ = validation qualifier.

Figures



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Date: 8/28/2013

Approved By: BFoss

Checked By: CLong

Drawn By: BGrod

Office: Hou

Legend

Holloman AFB

N

WGS 84 UTM Zone 13N Meters

0 20 40 80
Kilometers

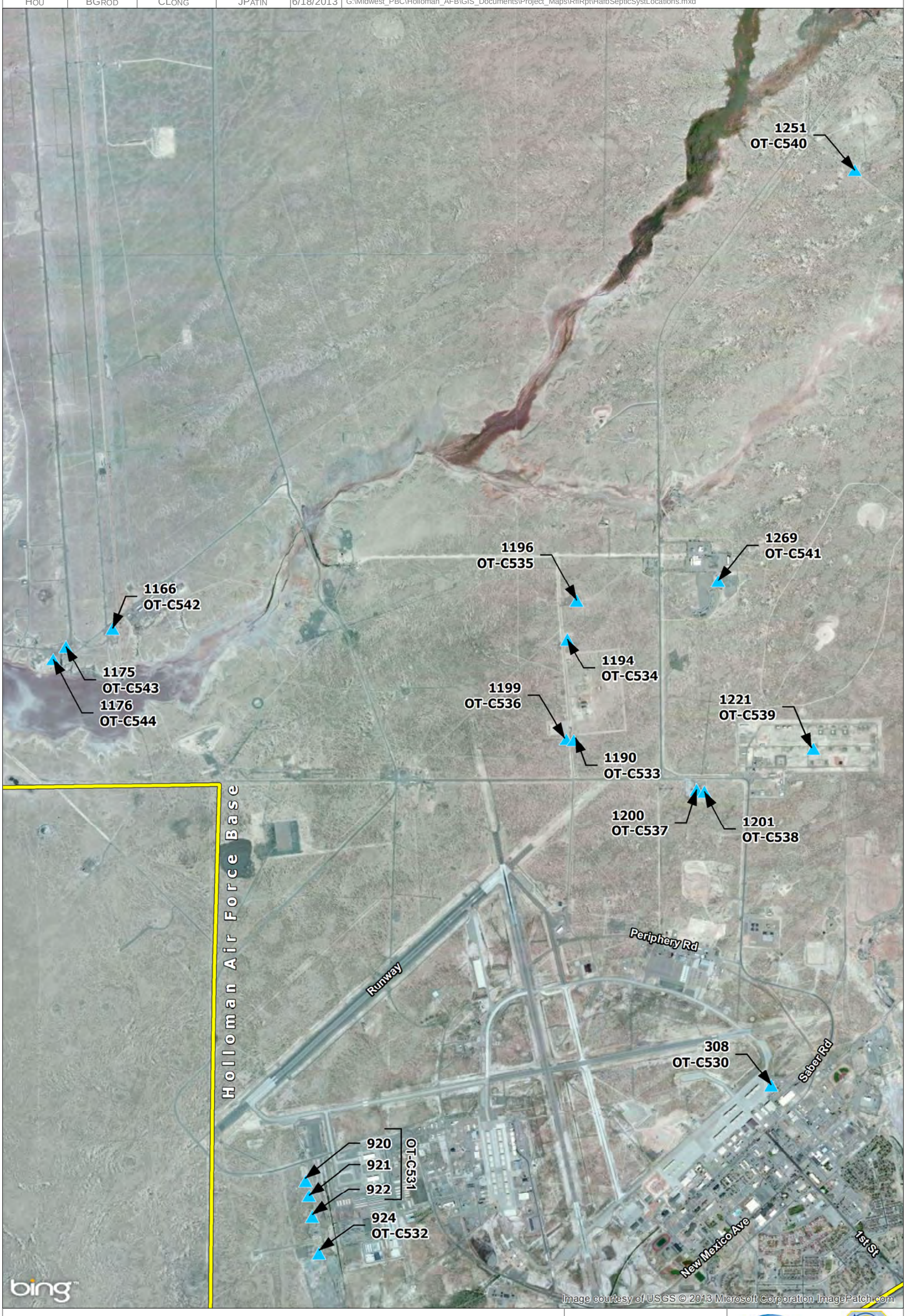
0 10 20 40
Miles

Figure 1-1

Holloman Air Force Base Location

Holloman AFB, New Mexico

Office	Drawn By	Checked By	Approved By	Date	File Path
Hou	BGrod	CLong	JPatin	6/18/2013	G:\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbSepticSystLocations.mxd



LEGEND

- Holloman AFB
- Septic Tank System

N

WGS 84 UTM Zone 13N
Meters

1 inch = 2,800 feet

0 700 1,400 2,800
Feet

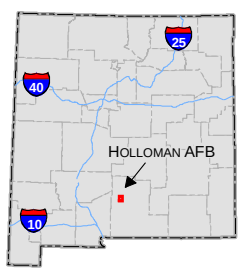
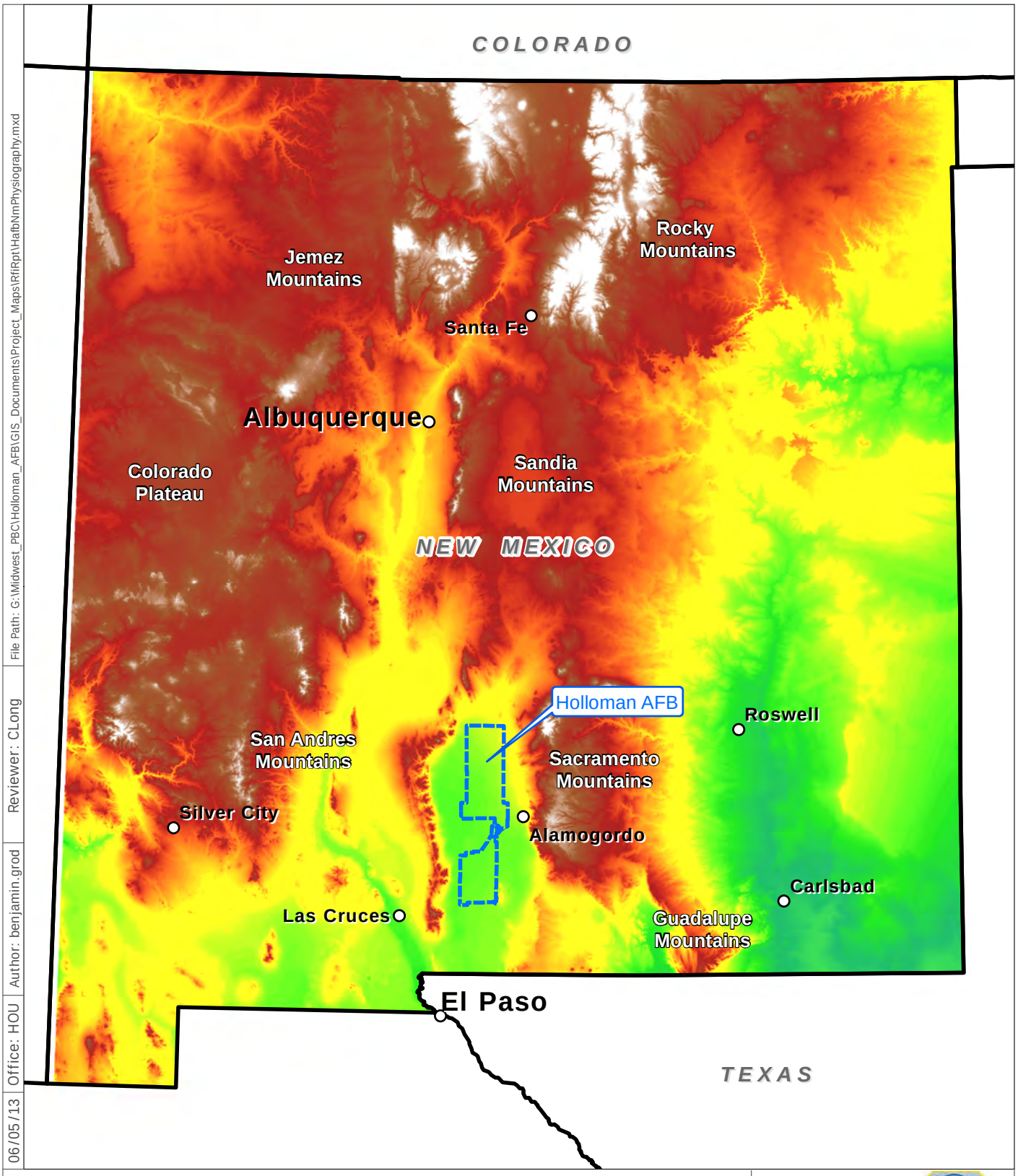


Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
Holloman AFB, NM



File Path: G:\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbNmPhysiography.mxd
Reviewer: CLong
Author: benjamin.grod
Office: HOU
06/05/13

Legend

Holloman Air Force Base (AFB) Installation Area

Elevation
- High : 3,936 meters
- Low : 0 meters

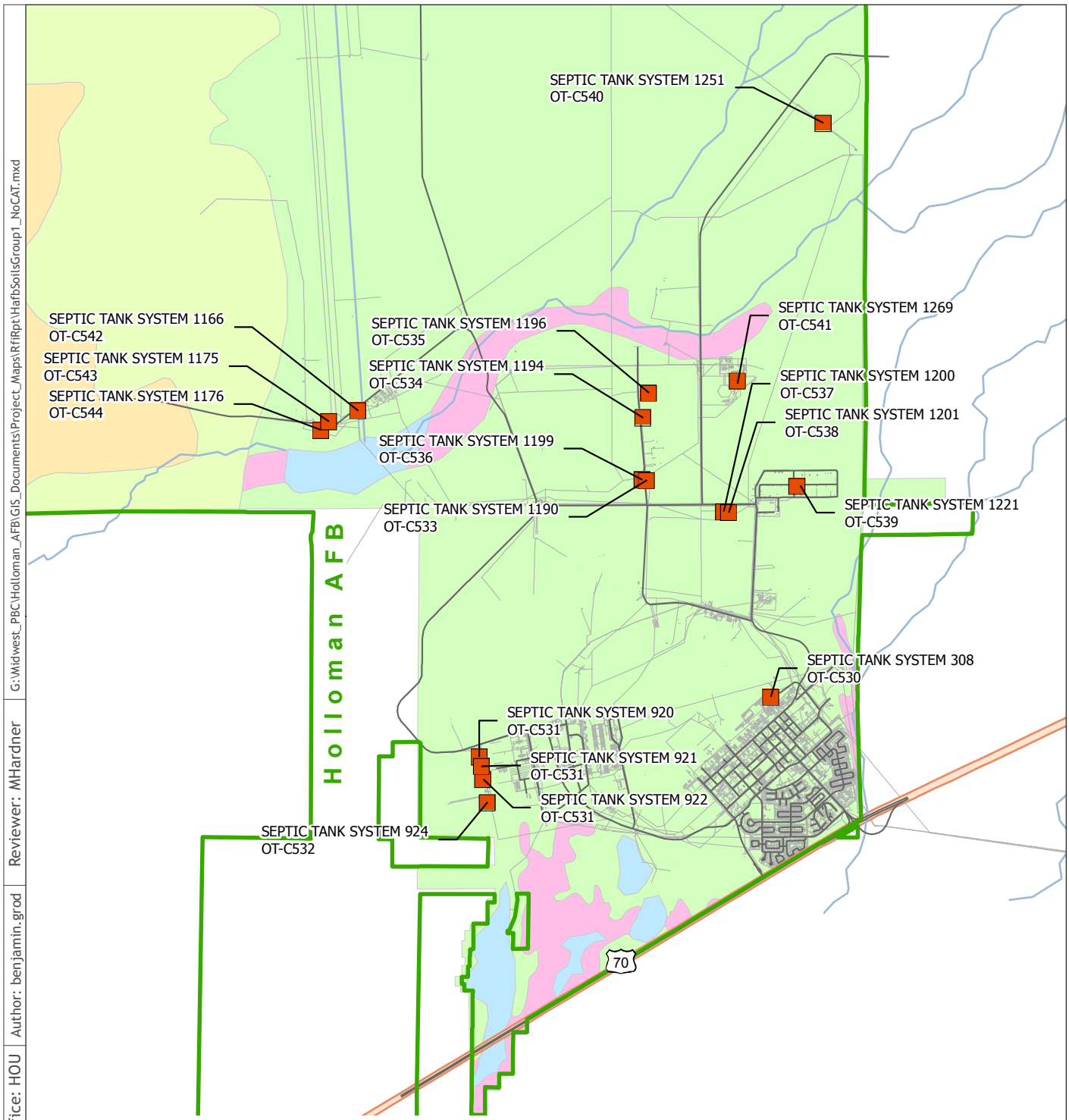
NAD 83 SPCS
New Mexico Central
Feet

0 50
Miles

Figure 2-1

Physiographic Map

Holloman AFB, New Mexico



Note:
1) Soils types at Holloman Air Force Base, New Mexico are based on United States Department of Agriculture (USDA) Soil Conservation Service Classifications. Source USDA, 1981

06/18/13 | Office: HOU | Author: benjamin.grod | Reviewer: MHardner | G:\Widwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbSoilsGroup1_NoCAT.mxd

Legend

- Installation Area
- Group 1 Septic Tank Sites
- Surface Water
- Active Dune Land Gypsum
- Duneland Yesum Association
- Holloman-Gypsum Land-Yesum complex
- Intermittent Water
- Mead Silty Clay Loam
- Rock Land Warm

NAD 83 SPCS
New Mexico Central
Feet

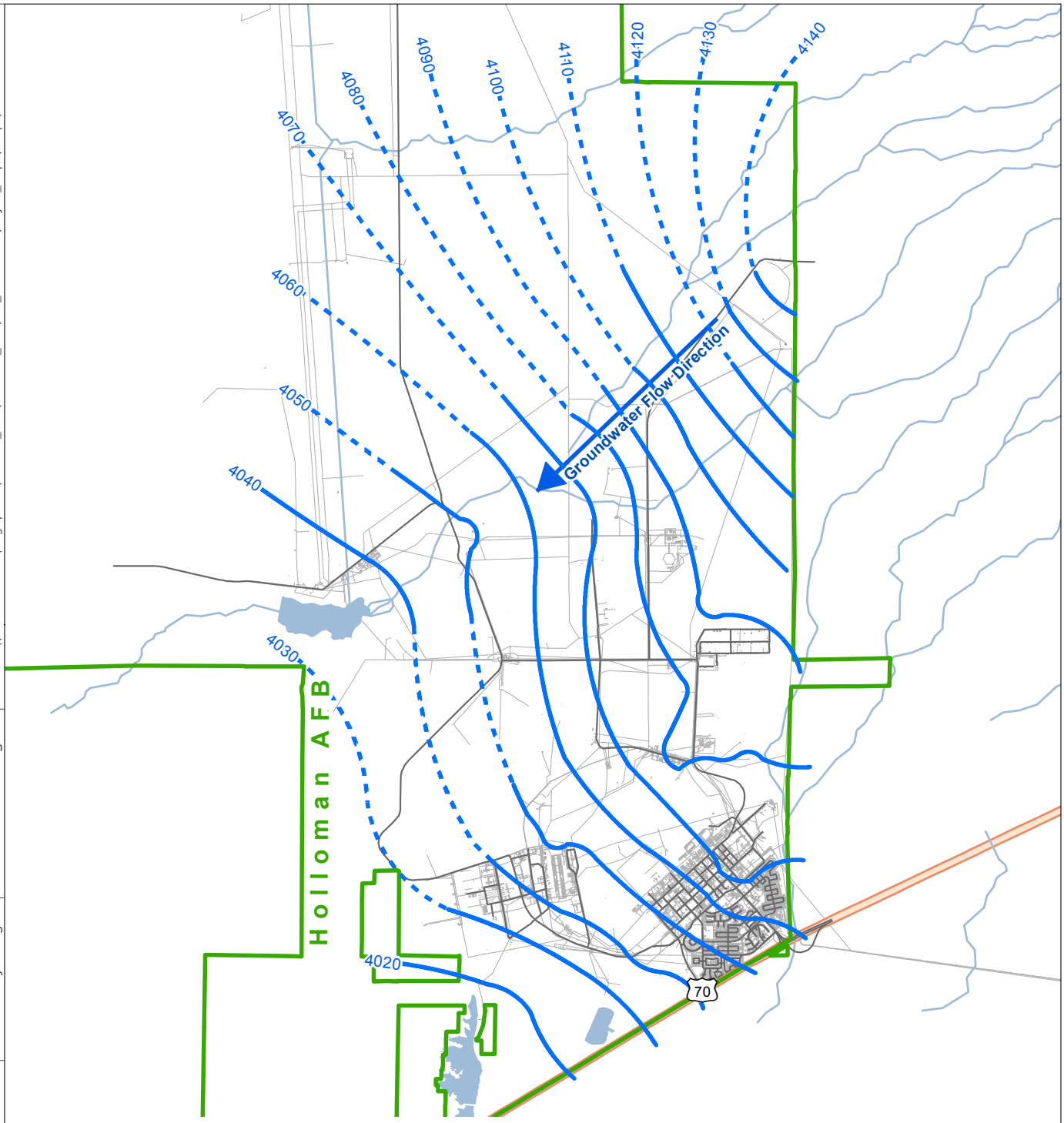
0 7,000
Feet

CBI

Figure 2-2

Septic Systems Soils Map

Holloman AFB, New Mexico



Note:
1) Groundwater contour map showing groundwater elevation contours across Holloman Air Force Base, New Mexico, are based on 2002 measurements taken from the shallow aquifer.
2) Source: Holloman AFB GIS, 2002 LTM.

08/28/13 | Office: HOU | Author: benjamin.grod | Reviewer: CLong | File Path: \\cfsfs01.cfs.com\arcgisprod2\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbGw2002.mxd

Legend

- Installation Area
- Groundwater Flow Direction
- Groundwater Elevation Contour (ft) (Dashed where inferred)
- Surface Water

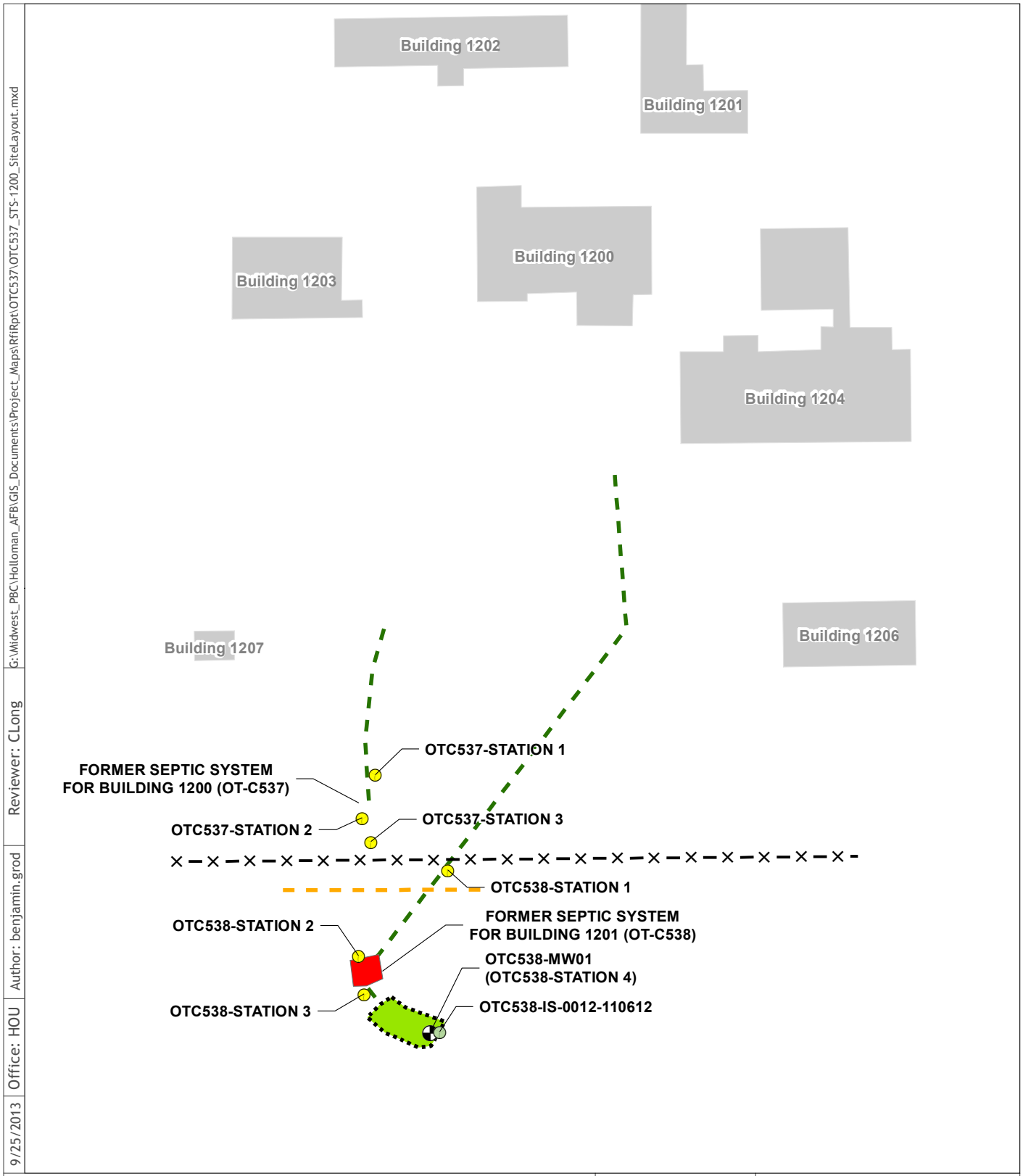
NAD 83 SPCS
New Mexico Central
Feet

0 8,000
Feet

Figure 2-3

Regional Groundwater Contour Map

Holloman AFB, New Mexico



G:\Widwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\OTC537\OTC537_STS-1200_SiteLayout.mxd | Reviewer: CLong | Author: benjamin.grod | Office: HOU | 9/25/2013

Legend

- Monitoring Well
- Soil Boring Station
- Confirmation Sample
- Communication Utility
- Influent Line
- Fence
- Septic Tank
- Leach Field
- Building

N

NAD 83 SPCS
New Mexico Central
Feet

0 30 60
Feet

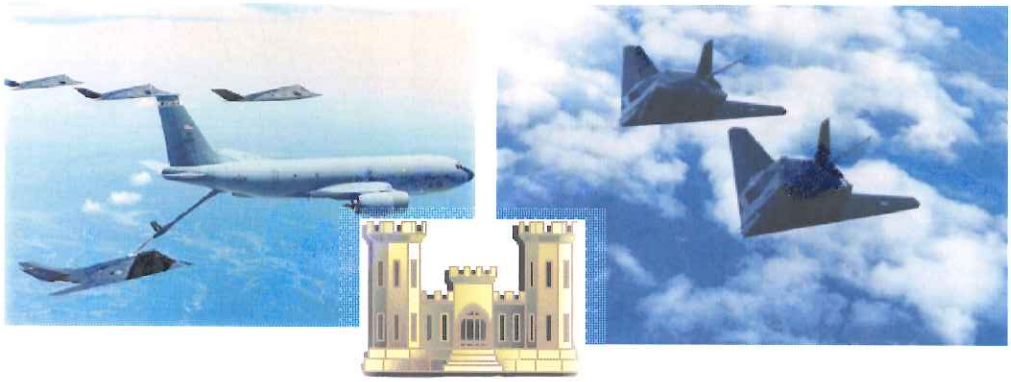
Figure 3-1

Site Layout and
Sampling Locations
Buildings 1200 & 1201
Septic Tank Systems
OT-C537 & OT-C538

Holloman AFB, New Mexico

Appendix A
Historical Records

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS



Holloman Air Force Base
New Mexico

APRIL 2007

Headquarters, Air Combat Command
Langley Air Force Base, Virginia

49 CES/CEV
Holloman Air Force Base, New Mexico

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH FIGHTER WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

APR 27 2007

MEMORANDUM FOR NEW MEXICO ENVIRONMENT DEPARTMENT
Attn: Mr. James P. Bearzi
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe NM 87505-6303

FROM: 49 CES/CEV
550 Tabosa Ave.
Holloman AFB NM 88330-8458

SUBJECT: Submittal of Information Required by NMED Letter of August 30, 2006
Septic Tanks and Associated Drain Fields, Holloman AFB
EPA ID# NM6572124422

1. Pursuant to Part 4, Condition IV.B.3 of Permit No. NM6572124422, Holloman AFB is submitting the final portion of the required information.

2. This final portion of the required information covers the history of the facilities served by each septic tank and, based on the historic activities that occurred in each facility, the possible wastes that were discharged into the septic systems.

3. If you have any questions or comments, please contact Mr. Dave Griffin or Mr. George Fish at (505) 572-3931.

DEBORAH J. HARTELL
Chief, Environmental Flight

cc: w/Attachments
Mr. Cornelius Amindyas
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

Mr. David Strasser
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS
HISTORY

Holloman's records show a list of fifty seven (57) septic tank systems broken into three categories- Active Septic Systems, Inactive Septic Systems, and Removed Septic Systems. The systems are identified by the Building number they are/were attached to. There are twenty five (25) Active Septic Systems which are listed in this report. There are twenty one (21) Inactive Septic Systems that are listed and the history of activities in the building associated with the system is identified to the extent of available knowledge. There are eleven (11) Removed Septic Systems listed with histories based on available record knowledge.

The Active systems are identified, but no histories of the buildings are provided as this will likely change over time particularly with change in mission (aircraft on base) or tie-in to the base waste water treatment system. A history will be added to this list if and when the septic system is no longer needed and moved to the Inactive or Removed list.

The Inactive systems are scheduled for proper closure per guidance given in the NMED Liquid Waste Regulation 20.7.3.307 NMAC. This regulation calls for capping of the line(s) from the building to the septic tank, pumping out the tanks contents, penetration of the bottom of the tank, along with collapse of the tank roof and filling of the tank with sand or soil.

The septic systems on the Removed list have had the actual septic tank excavated and removed.

A search of Real Property records and the Historic Properties Inventory yielded the information available on the buildings. There was not information available on every building, but if new information becomes available, it will be added to the list.

Attachment 54a-e shows the current plan of where the sewer system lies to show what buildings are currently connected to Holloman's Sewer System. Any building that does not have an active septic tank is either abandoned or connect to Holloman's Sewer System.

ACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	149	1998		1000
2	312	1994		1000
3	375	1968		500
4	882			
5	864 (863)	1994	5'x8'x6'4"	750
6	885	1970	7'10"x4'8"x6'10"	1000
7	886			
8	887	1991		1000
9	923	1959	4'2"x7"x7'9.5"	1600
10	1022	1992		1200
11	1066	1994		1000
12	1160	1957	5'x12'4"x7'6"	1500
13	1161	1957		750
14	1162	1957		350
15	1163	1957		350
16	1169	1962		1680
17	1195	1962		1260
18	1256	1970	12'8"x4'8"x5'	
19	1270			
20	1271			
21	1278	2004		1250
22	1284			
23	1625			
24	75600	1989		1200
25	La Luz Gate (1290)(**1292**)	2004		1250

INACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	308	1965		
2	920	1959	4'2"x7"x7'9.5"	1600
3	921	1959	4'2"x7"x7'9.5"	1600
4	922	1959	4'2"x7"x7'9.5"	1600
5	924	1959	4'2"x7"x7'9.5"	1600
6	1091	1969	6'8"x3'x8'5"	
7	1097	1987	5'10"x5'x7'8"	1672
8	1190	1952	9'x4'x8'10"	3000
9	1194	1987	4'x4'x8'10"	1350
10	1196	1993	4'6"x11'x6'	1300
11	1199	1957		500
12	1200	1954	4'x8'x4'	1000
13	1201	1951	2'6"x6'6"x5'5"	650
14	1219	1985	5'4"x10'6"x8'4"	
15	1221	1983	4'8"x9'4"x6'2"	1100
16	1226	1985	5'6'2"x6'	
17	1235	1986		1189
18	1239	1977	4'6"x8'6"x6'	750
19	1250	1957		350
20	1251			
21	1269	1966	4'6"x9'	500

INACTIVE SEPTIC SYSTEMS

BUILDING 308

This is a 3200 SF building originally constructed in 1965. The original operation in the building was calibration of guided weapons for aircraft. In the 1970s and early 1980s the building was used as a nosedock for F-4 - Test Aircraft Radar electronic work area. It has never had a floor drain.
This facility is currently being used to store air craft support equipment for Building 309. The shop has been used in the past for servicing, inspecting, and repairing AGE equipment, but due to the reduction in personnel, this work is currently only performed in Building 309. The need to expand the work area for AGE equipment maintenance into Building 308 in the near future is not anticipated. A current view of the building is shown below in Figure 1.

Figure 1: Picture of Bldg. 308

Facilities associated with the septic system consist of:

- Toilet
- Lavatory
- Janitorial Sink

The building is located at 340 Delaware Ave. The point of contact for this building is Ms. Vicky Cruz and Mr. Adam Ferrara, they can be reached at 575-~~475~~-5272. The hours

572

of operation for this building when it is in use is one 8.5 hr shift (0630-1500) and one 9 hr shift (1500-2400), five days per week.

Industrial Wastewater Drainage: There are no floor or trench drains in this facility. A janitor's sink is located in the restroom. The sanitary sewer pipe from the restroom connects with the pipe from the restrooms in Building in 309. The effluent pipe then proceeds south to Manhole 334E the layout of this facility can be seen below in **Figure 2**. At the time of the inspection surveyors were unable to open Manhole 334E. No cross-connections to the storm sewer were identified.

Industrial Wastewater Sources/Existing Pretreatment/ Existing Management Practices: There is only once source of industrial wastewater from this facility: floor washing

Floor Washing: The floor in this facility is washed every three months using a Tennant floor scrubber, 10 gallons of water and Simple Green. Average and maximum daily wastewater flows from this activity are estimated to be less than one gallon and ten gallons, respectively. The wastewater from this activity is discharged into the French drain at Building 309; therefore, the quantity of wastewater generated by this activity is included in the flow summary for Building 309.

Existing management practices consist of sweeping the floor prior to washing it.

Site Description: Aircraft Corrosion Control
Site Specific Contingency Action Plan: See Attachment 1
Secondary Containment Routes: None
Probable Spill Route: Leaks dissipate in local area on ground
Material Compatibility: No material incompatibilities

Connected to Sewer?

Stored Substances:

Chemical	Container Type
MEK	1 gallon can
Polyurethane Paint	1 gallon can
Naptha	1 gallon can
Toluene	1 gallon can
Epoxy Primer	1 gallon can
PD-680 Type II	55 gallon drum
Waste Paint/Thinners	55 gallon drum

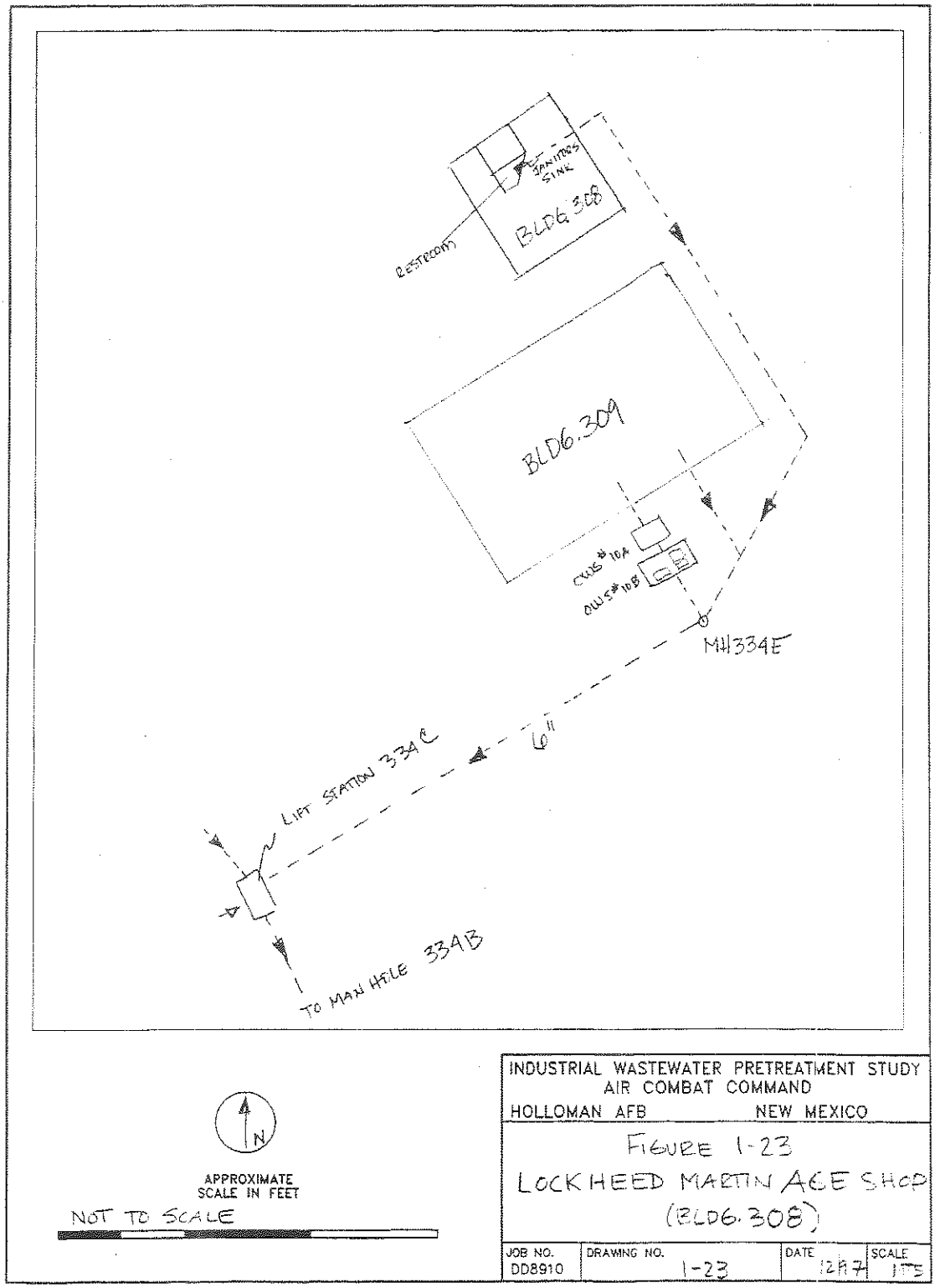


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Figure 2: Layout of Bldg. 308 and 309

INACTIVE SEPTIC SYSTEMS

BUILDINGS 920, 921, 922

These are three identical buildings constructed in 1959. Each building has 1900 SF. They were originally built for ammunition assembly which primarily consisted of bolting rocket components together prior to use. All three buildings are presently vacant and empty.
Each of the three buildings has a simple bathroom consisting of a:

- Toilet
- Lavatory

Multiple inspections were set up for this site, but no one showed up. Therefore, no follow-up information was found. Pictures of the current buildings are shown below in Figures 3-5.

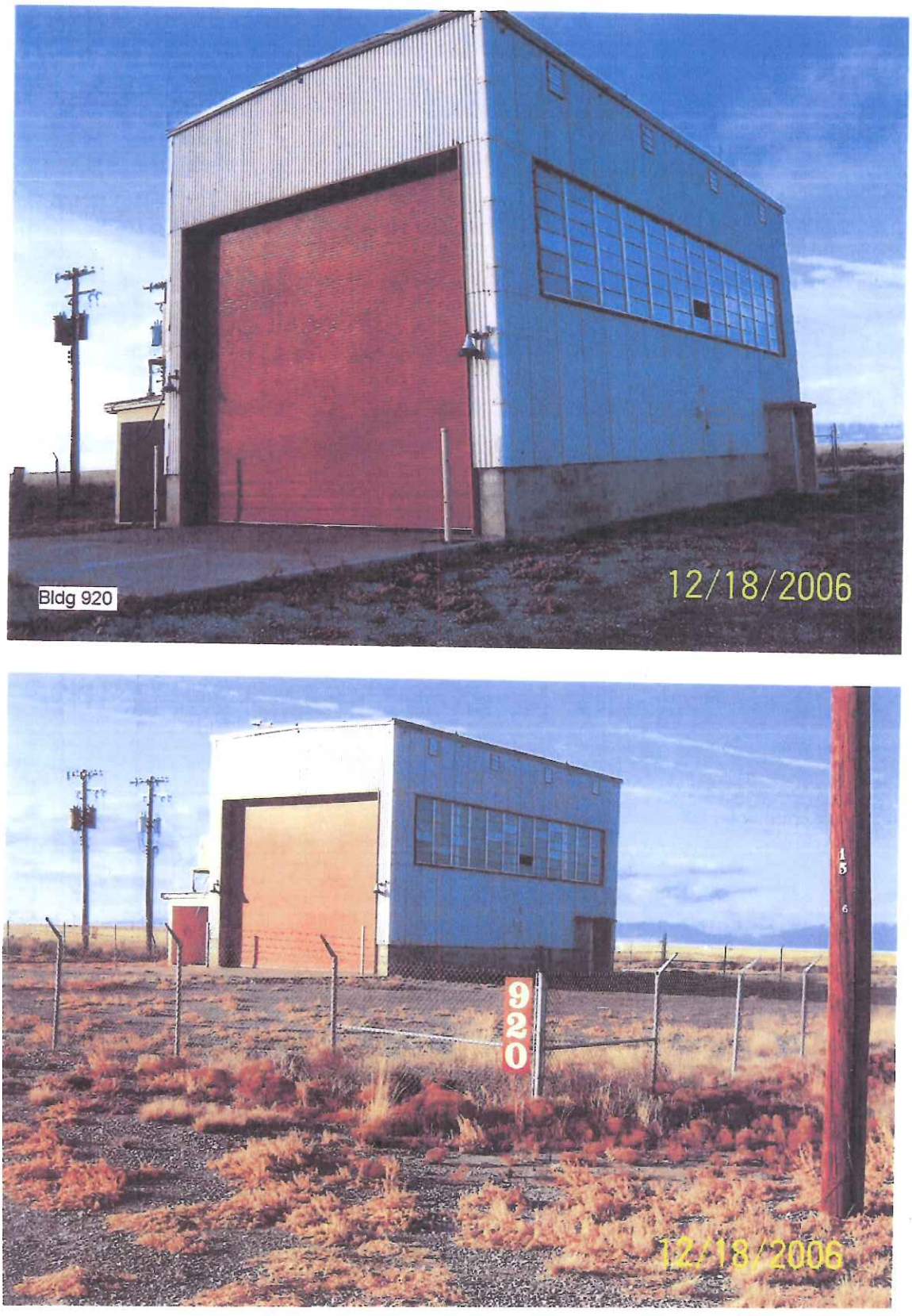


Figure 3: Pictures of Bldg. 920

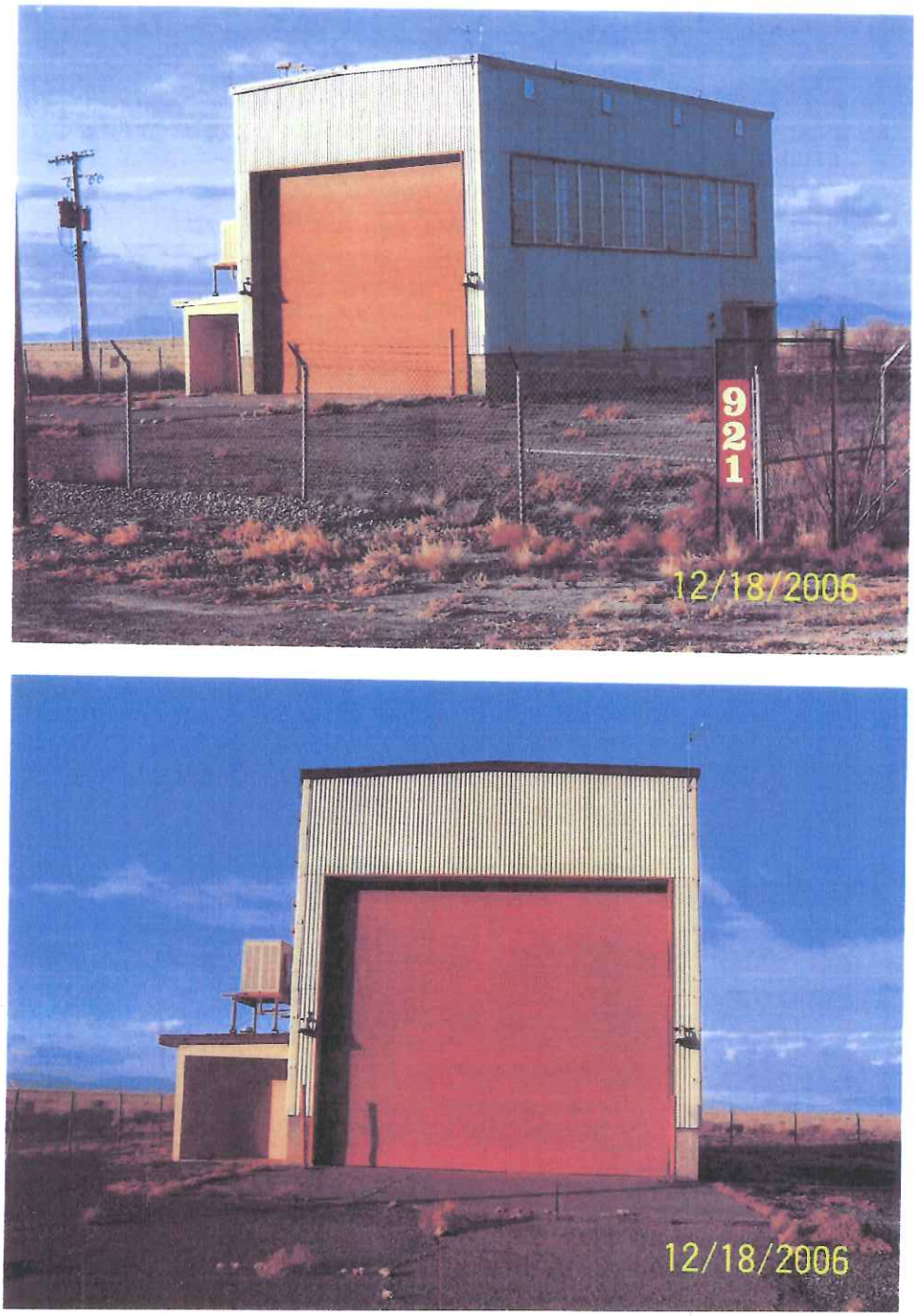


Figure 4: Pictures of Bldg. 921

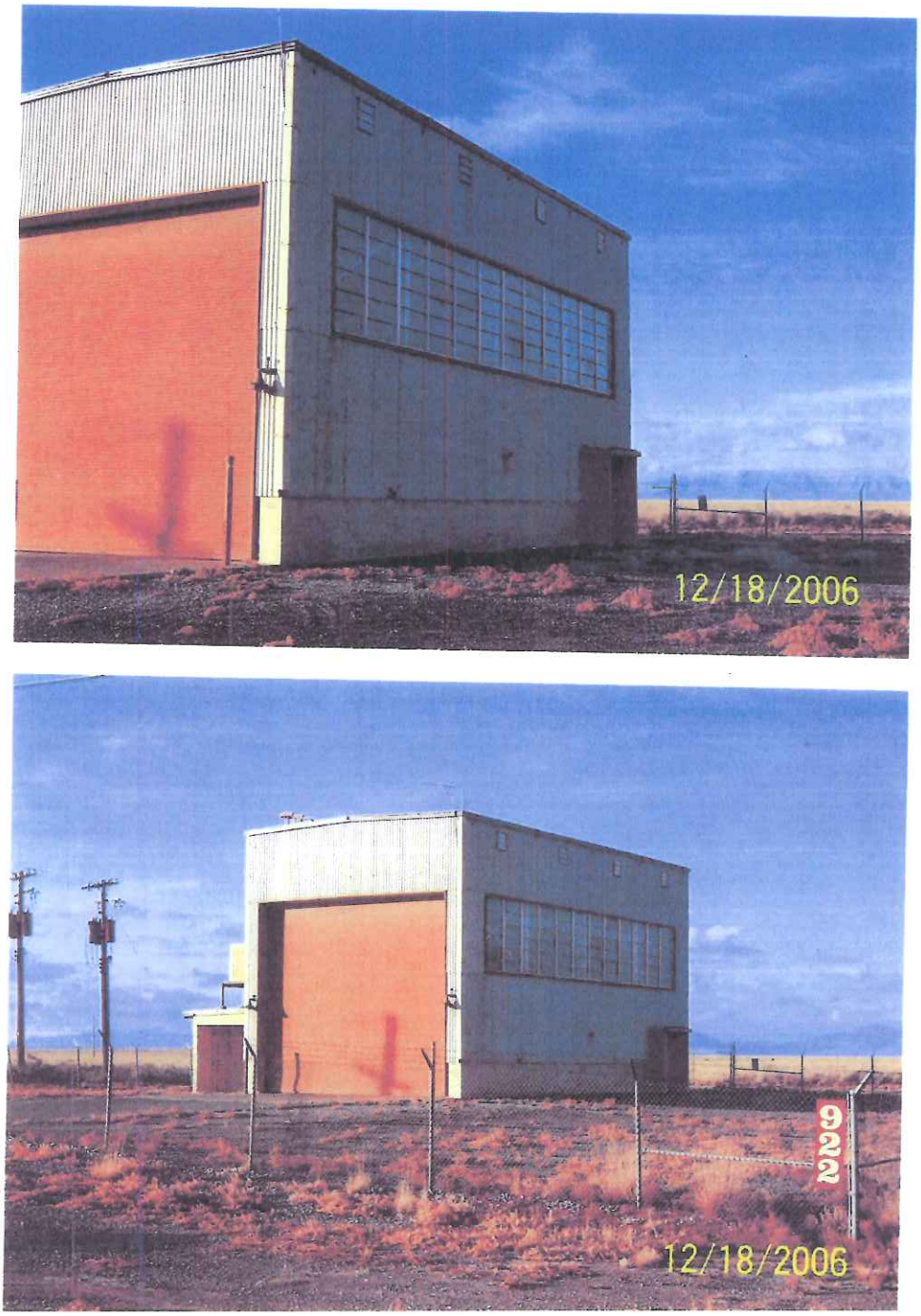


Figure 5: Pictures of Bldg. 922

INACTIVE SEPTIC SYSTEMS

BUILDING 924

This building was constructed in 1959 and has 4800 SF.
The building's original service was ammunition assembly similar to buildings 920-922.
It was later used for maintenance of radar tracking equipment.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

An on site inspection was done for this building on 20 Dec 2007 with the current facility manager, Mr. Michael Tackett. He did not have any information about the history of the septic tank system. Currently the building is being used for munitions storage. For the past two year it has stored rocket motors for the test track. From the on site inspection and drawings (Attachment 4-6) it can be seen that the bathroom drain is separate and there are no floor drains.

There are no pictures on file of this building.

INACTIVE SEPTIC SYSTEMS

BUILDING 1091

Site Description: There are no current files on this building because the building has been demolished. The building served as the Airfield Control Tower until replaced by the present Control Tower
On Attachment 55b a drawing of where the leach field was located in 1984 can be seen.
Grid Coordinates: J.9, 10.2
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: No secondary containment associated with underground storage tank
Probable Spill Route: Leakage from underground tank will contaminate water table in local vicinity

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 / UST

There were also three drawings that were discovered during the research stage of the project. The drawing (Attachment 7) shows the Septic Tank Details, Septic Tank Drain Field and the Drain Field Details.

INACTIVE SEPTIC SYSTEMS

BUILDING 1097

Specifications and history of this building are given in the following "Cold War Survey: Holloman Air Force Base". Along with this survey an on site inspection was done on 28 November 2007 with the current facility managers, A1C Clinton Bennett and TSgt Robert Edyburn. During the on site inspection it was discovered that the bathroom is separated from work area drains. In the past the building was used as a communications work center (office space) until 2005. There are no floor drains in the work area. It is currently being used as a houses base for a radio system network. There were also three drawings (Attachment 8-10) that were discovered in the investigation phase of the project. The drawings show the Materials Septic System, the Septic Tank Placement and Piping, the Latrine Plan, and the Mechanical Plumbing Plan.

Facilities in this building consist of:

- Toilet
- Urinal
- Lavatory

Description: Communications facility
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: None
Probable Spill Route: Leaks dissipate in local area on ground

Tank Location: South of facility
Fuel Flow – South/West

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 /AST
	500 gal each/ 1 /UST (Abandoned)

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Communications, Receiver.
Historic: Transmitter/Receiver.
Street Address: 1432 Sabre Road, HAFB, 88330-7842.

Building Number: 1097

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [ ] Minor [ ] Moderate [x] Major

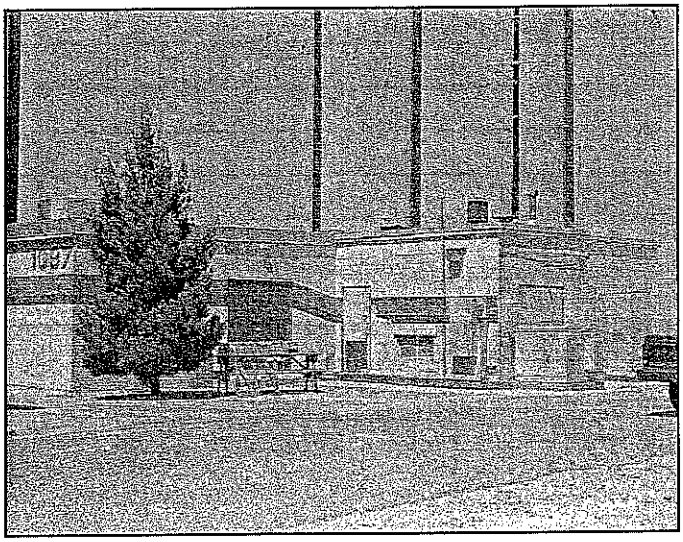
Comments:

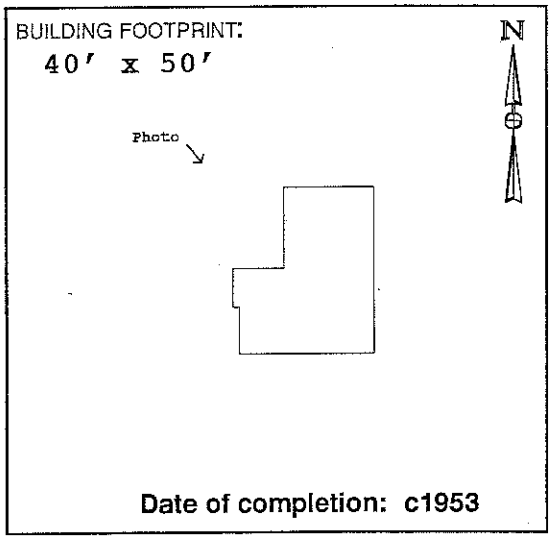
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1097 has not retained historic integrity.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1953

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1097 is a small transmitter building designed with few embellishments for utilitarian use only. Building 1097 originally had a rectangular footprint identical to Building 1098 and Building 1095. The original floor plan was sectioned into 4 rooms. An addition was constructed at the west elevation in 1986 using compatible structural and architectural components (CE File #1097-1). Both the builder and the architect are unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1097.

Current Function: Receiver/Air Traffic Control/Radio Control.

Original Function: Transmitter/Receiving/Communications.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1098-1 (c1952).

Foundation: Concrete wall footing. Concrete slab on granular fill.

Exterior walls: Painted concrete masonary units (CMU).

Roof: BUR on 2" rigid insul.; 2" poured gypsum on gyp board sup. by steel joists.

Notable interior features, including machinery:
Construction drawings document *"UHF Radio Air/Ground Facilities AN/GRC-27"*.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:
Continues to function as a communications facility/receiver site.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1097 has served as a Base communications facility since its completion c1953. Several renovations have resulted in a loss of historic integrity for this building. Building 1097 is no longer eligible for the National Register of Historic Places.

VII. ASSOCIATED BUILDINGS:

Location plan CE File #1098-2 identifies at least three north area transmitter sites. Building 1097 was associated with transmitter Building 1098. This facility is also associated with the flightline, and with communications Building 221.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building #1097 retains its original function as a radio receiver facility, however it has been modified to accommodate electrical, mechanical, and equipment additions and change-outs. Original equipment has been replaced.

Office space was added to the south elevation (1986: CE File #1097-1). All six windows at the north, east and west elevations have been blocked in. Original doors have been replaced. Vinyl floor tile covers original tile throughout. Dropped ceilings have been added.

This building, although retaining historic significance as a receiving site, has lost integrity of design, materials, workmanship, and association with its period of significance. Note: A Sgt. Boots (extension 3132) was identified by Building 1097 personnel as being a possible source for oral history research concerning specific activities associated with this facility.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Office space added to the west elevation (c1986: CE File #1097-1).

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Construction of adjacent buildings has altered viewshed.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Windows have been blocked in.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: An addition obscures the original west elevation. The original window treatments removed. Dropped ceilings added. Original asphalt floor tile covered.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: The presence of interior communications equipment and exterior poles contribute to the integrity of feeling as a radio site.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

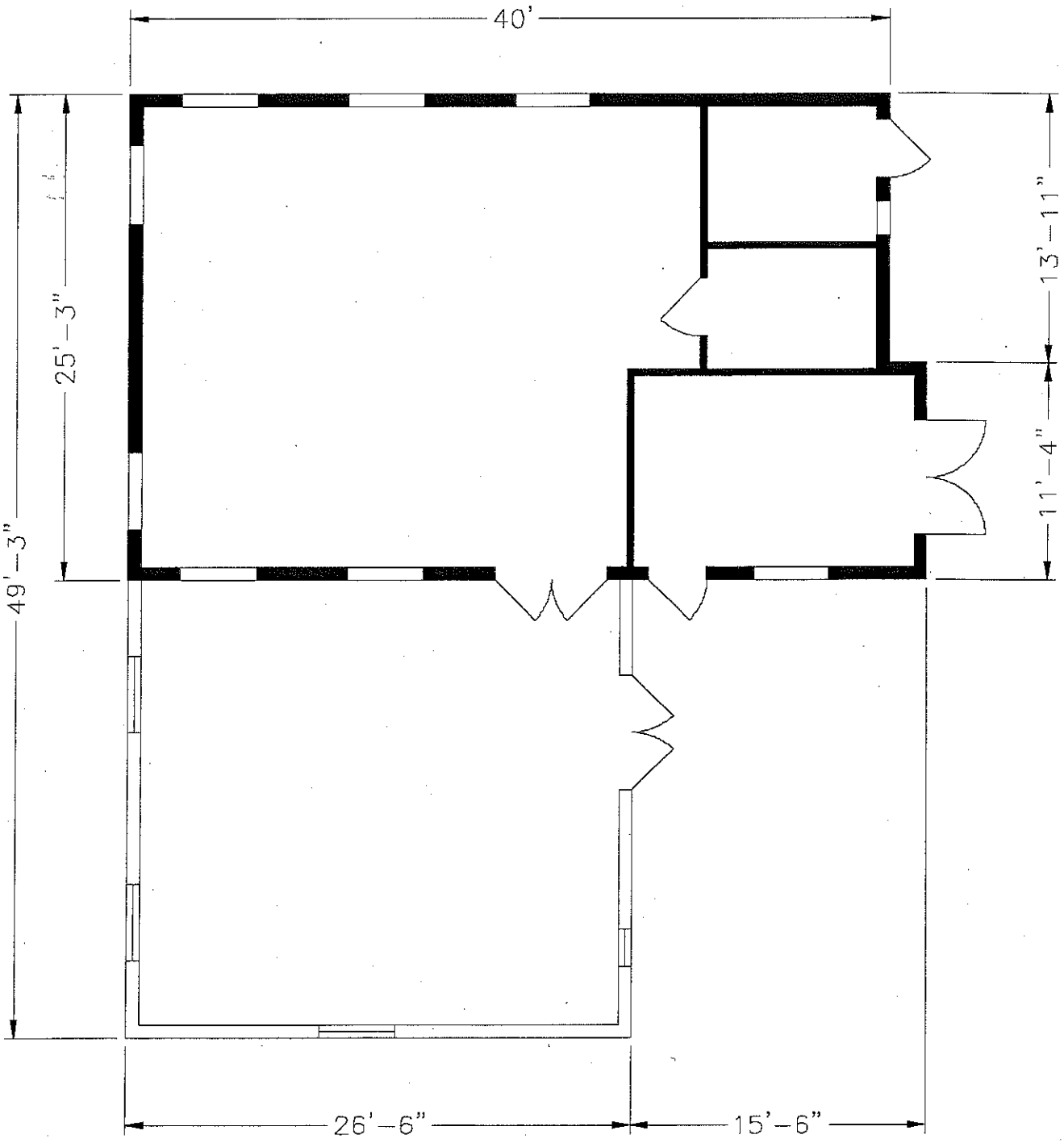
Comments: Original equipment has all been replaced.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #81**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



140

Source: CE File #1098-2 (c1971)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1097** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1190

This building was constructed in 1952 and demolished in 2002. Specifications and history are provided in the "Cold War Survey".

The only drawing discovered was the plumbing floor plan and it can be seen in Attachment 11. Attachment 55d shows the current location of the leach field in 1984.

2002 Demolished Due To Unrelated Condition

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Security Police Building.
Historic: Change House/Unconventional Fuel Storage.
Street Address: 1514 Lethal Road, HAFB, 88330-7840.

Building Number: 1190

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1190 is in need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

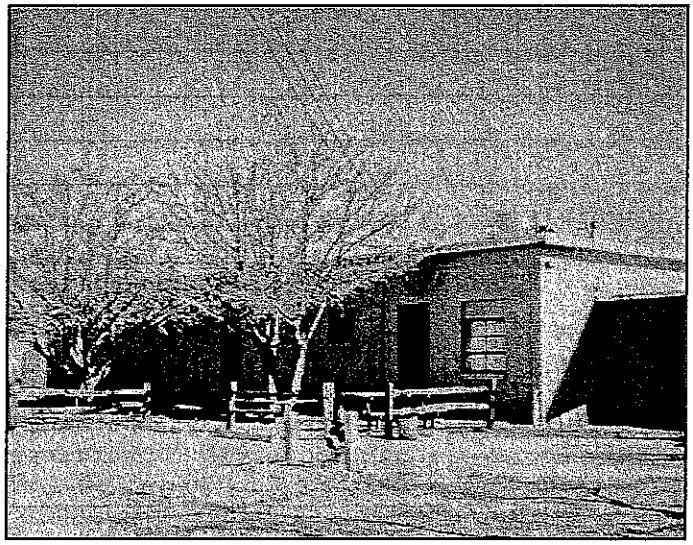
Comments: Interior partitions have been removed (date unknown).

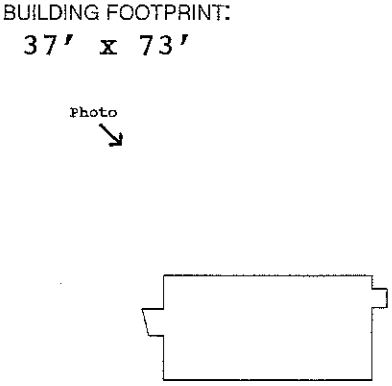
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1190 is a single-story, flat-roofed, concrete masonry unit (CMU) building exhibiting large roll-up equipment doors, numerous personnel access doors, and asymmetrical window fenestration. Construction drawings prepared in 1951 were stamped "As-built" but were not stamped in the revision block. Real Property Accountable Record/1190 indicates that Building 1190 was completed c1952 as a Change House for unconventional fuels personnel. W. C. Kruger Company (Santa Fe, NM) provided the construction drawings stored in CE File #1190. The builder is not known. A comparison of the current building and original blueprints reveals that no structural modifications to the building have occurred.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1190; CE File 1195-1 (c1951).

Current Function: Security Police operations.

Original Function: Change House, Unconventional Fuels.

Interim Functions: "RC Con House" (n.d.); "Prpln R-L Fuel/Lub" (n.d.); Prop Res Lab Rocket" (n.d.); "Prpln R-L Rkt" (n.d.); Sp Operations (n.d.).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1190-1 (c1951).

Foundation: Poured concrete footings and grade beams; concrete slab.

Exterior walls: Concrete masonry units (CMU).

Roof: (Built-up) gravel on rigid insul.; 2" slab sup. by metal lath and steel joists.

Notable interior features, including machinery: Shower stalls, locker room, dressing room, and laboratories.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

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VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Recommend reassessment of Building 1190 once the fifty-year construction date is met in the year 2002. This building retains historic integrity.

VII. ASSOCIATED BUILDINGS:

According to CE File #1190-1 *Title Sheet*, Unconventional Fuels Storage Building 1190 was associated with Building 1194 (Booster Inspection), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

This building retains all aspects of historic integrity. Although not meeting the "exceptional importance" standard imposed on buildings constructed within the last fifty years, Building 1190 remains potentially eligible as an individual property once the fifty-year date of construction is met in the year 2002. Recommend inclusion in a Multiple Property nomination along with the other unconventional fuels storage buildings. Building 1190 is currently being used as a storage and administrative facility by the 49th Squadron Security Police personnel. The original shower stalls, dressing room, locker room, shop, tools and supply rooms are all used for storage. Free-standing shelves have been installed to accommodate storage. As a result, some original doors and windows are blocked from view. Minor alterations have occurred at the interior. Two partitions have been removed. Glazed tile walls appear to have been added to at least one office. Vinyl tile has been installed over one section of the concrete slab in what once served as a machine shop. Some of the window panes have been painted. Because this facility remains potentially eligible, recommend that the original design features be considered in future modifications, and that photographs document any changes to the essential features. Suggested routine maintenance: Prune trees away from principal facade. Noticeable water damage warrants inspection of the roof. Replace broken window panes. Repair hole at exterior south elevation wall.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: Interior room layout as a Change House remains a key design element. This layout includes large open interior spaces, smaller labs/offices, and showers, dressing, and locker rooms used by unconventional fuels personnel.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Although no longer used as such, Building 1190 continues to be situated in the vicinity of other buildings historically associated with unconventional fuels testing and storage. This building appears to been recently landscaped.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two interior partitions removed. Glazed tile walls in office rather than CMU shown on original drawings.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Nearly all original workmanship remains visible, particularly at exterior.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Aside from the change in operations occurring here, Building 1190 remains essentially as it was originally constructed.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

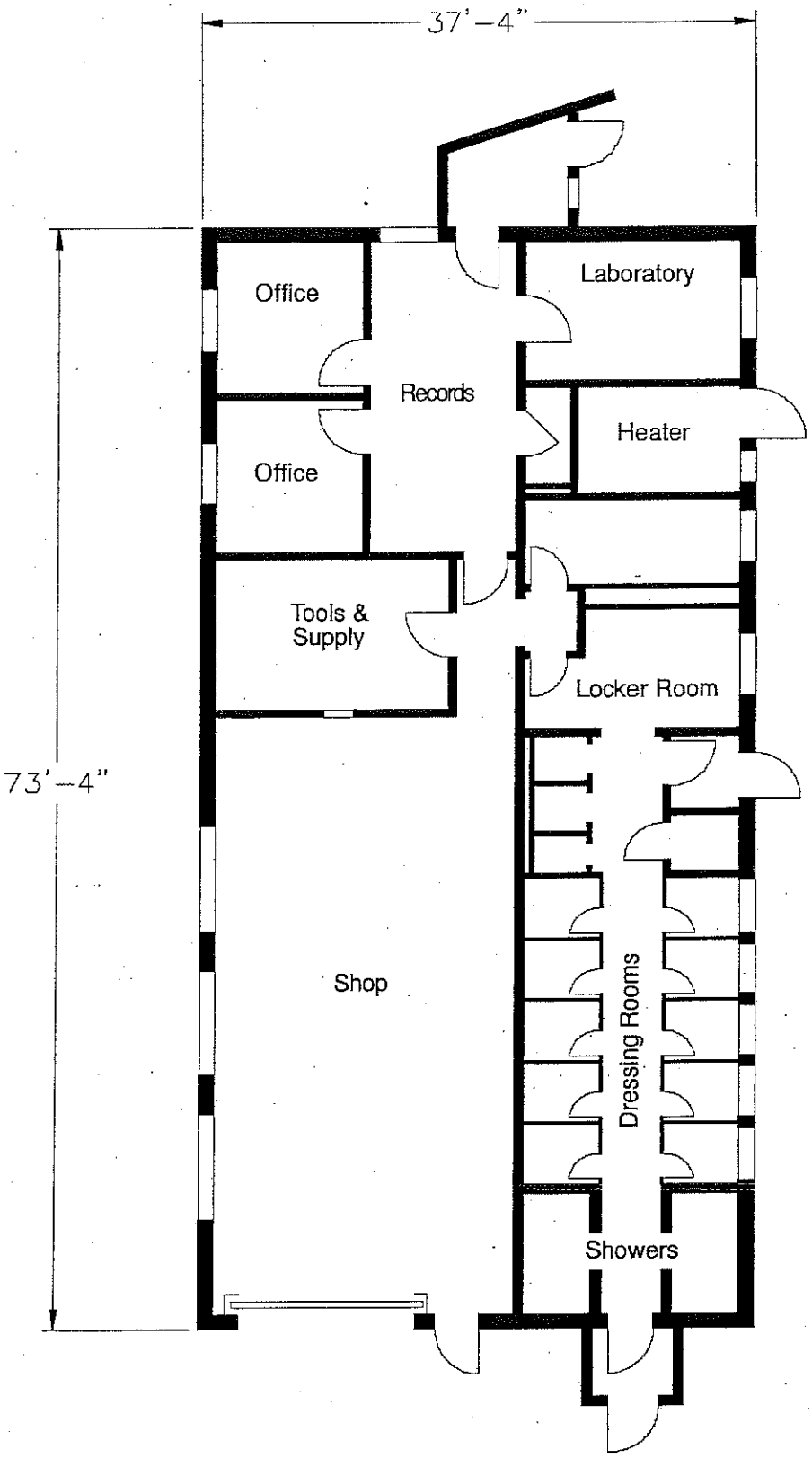
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #-Photo #**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1190-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1190** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Mike Gardner* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1194

Specifications and history are given in the "Cold War Survey".
Facilities in this building consist of:

- Toilet
- Lavatory

An on site inspection was done on 7 Jan 08 with the current facility manager, SSgt Joshua Roberts. In the inspection it was noted that the bathroom is separated from the work area drain. There was no history known. The building is currently being used for storage and it has been used for storage and has been used for storage for the past ten years.
Attachment 55d shows where the leach field for Bldg.1194 was located in 1984.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME: **Building Number:**

Current: Research Equipment Storage.

Historic: Booster Inspection/Unconventional Fuel.

Street Address: 1584 Lethal Rd., HAFB, 88330-7840. **1194**

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1194 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

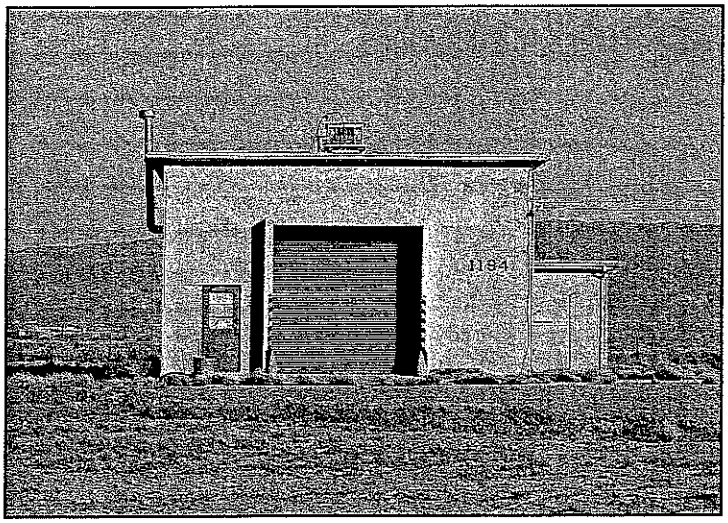
Comments: Interior partitioning is reversible.

Preliminary Determination of National or State Register Eligibility:

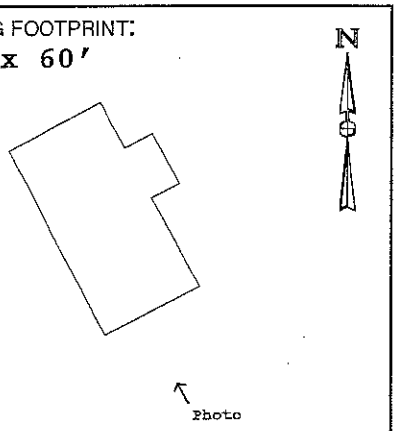
[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.



BUILDING FOOTPRINT:
30' x 60'



Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1194 is a rectangular, single-story, high bay structure made of concrete masonry units (CMU) and exhibiting a flat roof. The principal elevation faces west, showing one large roll-up door, and one personnel door. One row of windows is located below the eave line at the north and south elevations. The ceiling at the interior is exposed. "As-built" construction drawings show that Building 1194 was completed in 1952. W. C. Kruger Co. (Santa Fe, NM) provided the architectural work (1952: CE File 1194). The builder is unknown. No structural modifications to the original structure were noted.

III. HISTORIC AND CURRENT USE:

Current Function: Research equipment storage.

Original Function: Missile Assembly Test Building/Booster Inspection.

Interim Functions: "Mls/Space Rsch Tst" (n.d.); "M/Assembly Test Bldg" (n.d.); "Shp Wpn and Rlse Sys" (c1976); "BE Stor Cv Fclty" (n.d.); "Rsch Equip Stor" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1195-1 (c1952).

Foundation: Poured concrete footings and stem wall. Slab on compacted fill.

Exterior walls: CMU between concrete columns and bond beams.

Roof: BUR gravel. Rigid insulation. 2" concrete deck supported by steel joists.

Notable interior features, including machinery:

4-ton Wright Company chain-operated crane and hoist system, hoist no. 5197, serial no. 4925. The hoist is attached to a runway "I"-beam (crane) supported by steel support beams. Large metal roll-up doors at east and west elevations.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

210

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1194, although not meeting the "exceptional importance" standard, may be eligible for the National Register for its role in early Cold War materiel development once the fifty-year construction date is met in 2002.

VII. ASSOCIATED BUILDINGS:

According to CE File #1195-1 (c1951) *Title Sheet*, Building 1194 was associated with Building 1190 (Change House), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1194 remains essentially as it was constructed c1952. The original floor plan layout included one main room and an equipment room. A small area in the northwest corner of the main room has been partitioned. No documentation was found pertaining to this modification. This minor partitioning of the main room is reversible. This building is no longer associated with either missile assembly and test activities or unconventional fuels storage, and currently serves as an equipment storage room for the 6585th Test Group. Construction drawings (1956: CE File # 1194-1) show that an addition to this building was planned. There is no indication that this addition was ever built. Because this building retains historic integrity, and may be eligible for the National Register under Criteria A and/or C once the 50-year construction date is reached in the year 2002, recommend that future modifications take essential design features into account. Note: One isolated occurrence of prehistoric artifacts was noted on the grounds north of the building, including one white chert core, and one secondary chert flake.

Suggested routine maintenance: Scrape, prime, and paint the exterior. Replace downspouts. Prune landscape plantings away from foundation.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Construction drawings show plans for an addition to the north elevation (1956: CE File #1194-1). There is no evidence that this addition was ever built.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The high open-bay floor plan allowing the crane and hoist system, and the large metal equipment roll-up doors remain as key design elements.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Buildings 1193 and 1194 remain in an unmodified and isolated setting.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Nearly all of the historic materials used to construct this building remain visible.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two doors have been replaced. All windows appear to be original. Interior partitions at the northwest corner divide the original floor plan.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Although retaining its original open floor plan, this building is currently used for storage of modern equipment.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

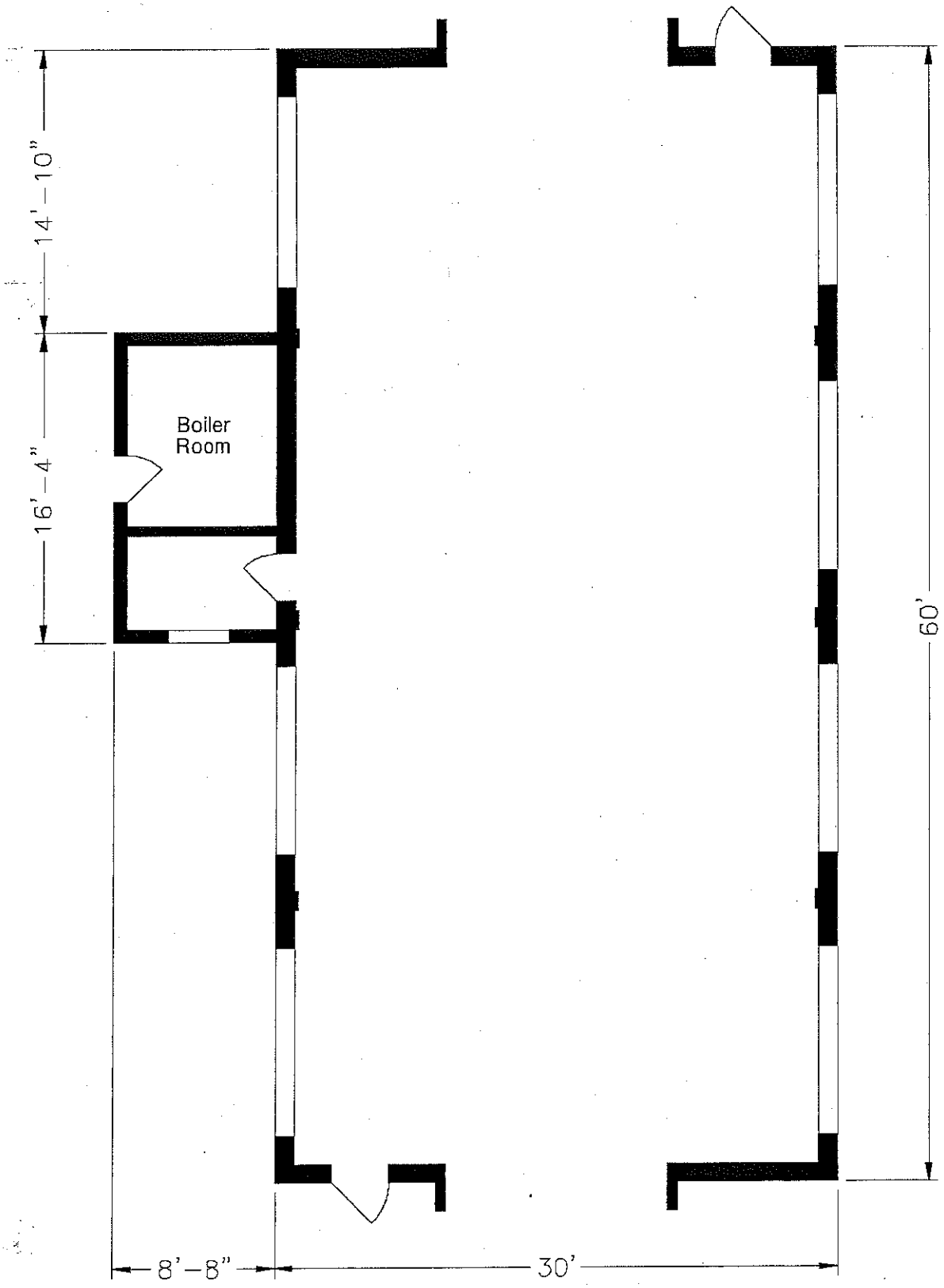
Comments: The open floor plan, isolated setting, hoist system, and nearby continuity check stand (Building 1193) contribute to this building's integrity of association.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #3-Photo #31**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1195-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1194** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1196

This building was constructed in 1956. It originally built for missile assembly, but is now in communications equipment storage.
The original facilities consisted of:

- Toilet
- Lavatory

These facilities were replaced in 1975 with:

- Toilet
- Urinal
- Lavatory

An on site inspection for this building was done on 4 Dec 07 with the current facility manager Sgt Lander. The information gathered from this inspection was that there were not any floor drains located within the building. In the past it was used for TAC can and for the past ten years it has been used for storage.
Attachment 55d shows where the leach field for Bldg. 1196 was located in 1984.

Figure 6: Picture of Bldg. 1196

INACTIVE SEPTIC SYSTEMS

BUILDING 1199

This building was constructed in 1957. It was originally built as a rocket fuel laboratory. In 1987 it was converted to the Security Forces Kennel.
As the fuels laboratory, it contained:

- Toilet
- Urinal
- Lavatory
- Shower

After conversion to the kennel, the facilities were changed to:

- Toilet
- Urinal
- Stainless Steel Sink

During the investigation stage of the project there were drawings found for building 1199. Attachment 12 and 13 are of the Site Plan, the Sewer Isometric, the Plumbing Plan and the Floor Plan.

Along with the drawings that were found an on site inspection was completed on 29 Nov 07 with the current facility manager, SSgt Gilmore. A new Security Forces Kennel area has been built and now the building is currently being used to house animals until they can be transferred to Alamogordo Animal Control.

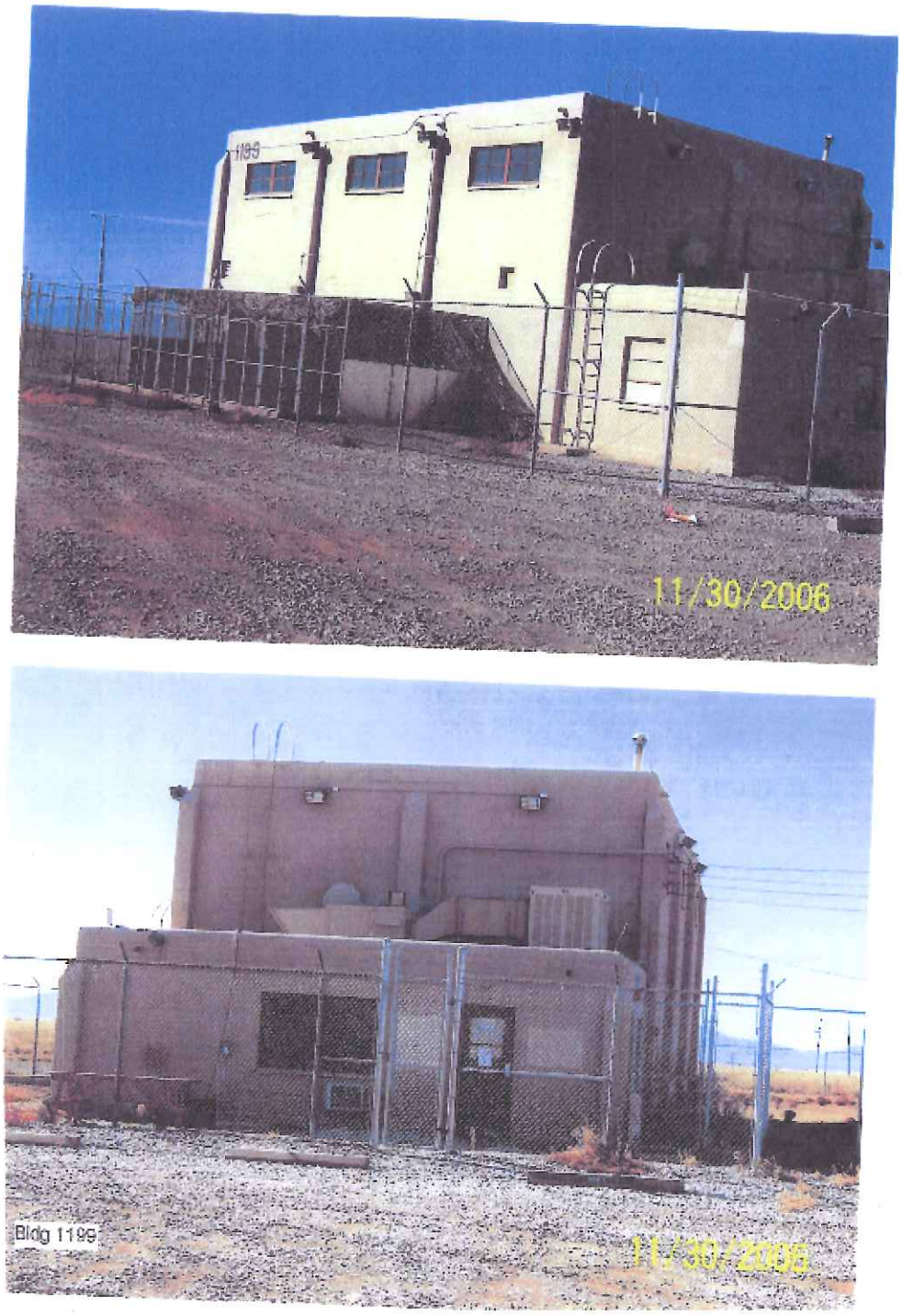


Figure 7: Pictures of Bldg 1199

INACTIVE SEPTIC SYSTEMS

BUILDING 1200

Specifications and History: See "Cold War Survey".

Three drawings were found for this building. These drawings show the Plumbing Floor Plan (Attachment 14), a Floor Plan (Attachment 15) and the Septic Tank and Drain Field (Attachment 16).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab, Medical (VACANT).
Historic: Space Biology Laboratory.
Street Address: 841 Douglas Road, HAFB, 88330-7823.

Building Number: 1200

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [ ] Needs maintenance [x] Deteriorated [ ] Archaeological

Comments: Building 1200 is abandoned, and showing signs of deterioration.

Degree of Alteration: [ ] None [ ] Minor [x] Moderate [ ] Major

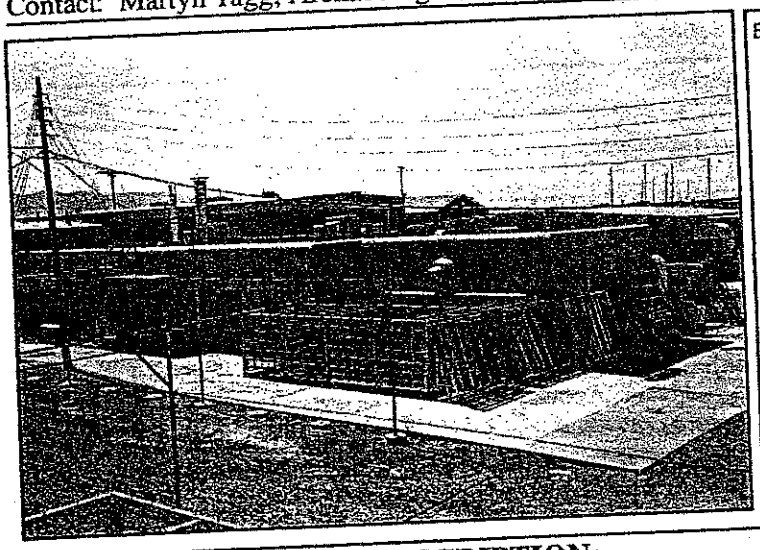
Comments: Alterations are architectural rather than structural.

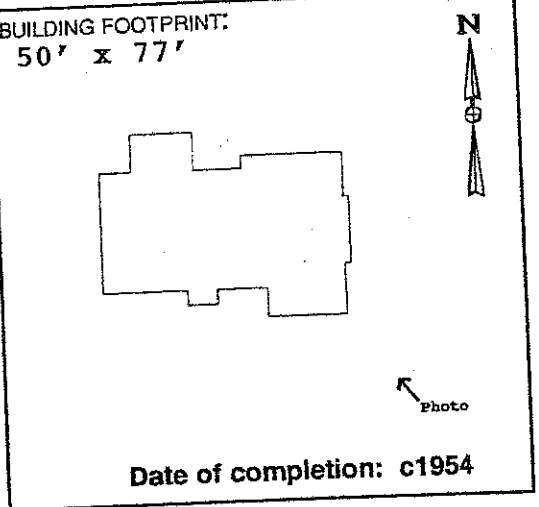
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1200 no longer retains historic integrity. See Section VI.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1954

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II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1200 is a rectangular, single-story, flat-roofed concrete masonry unit (CMU) building constructed as one of several laboratories dedicated to important aeromedical research using both animals and humans. None of the construction drawings were correctly stamped "As-built." According to Real Property Accountable Record/1200, the estimated date of construction is 1954. Subsequent improvements documented in CE File drawer #1200 include an addition to the medical lab (c1958), a covered passageway added to the boiler room (c1957), and a frame wall addition to the surgery room (c1957). Neither the builder nor the architect is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1200; Field visit Summer 1995.

Current Function: Vacant.

Original Function: Space Biology laboratory/Animal experimentation.

Interim Functions: Animal experimentation/Storage.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1200-1 (c1953).

Foundation: Concrete wall footings. Concrete slab on fill.

Exterior walls: Painted concrete masonry units (CMU).

Roof: BUR on concrete deck, supported by metal lathe and steel bar joists.

Notable interior features, including machinery:

Originally used as a medical laboratory, with work tables, work benches, built-in lockers, cabinets, operating tables, x-ray tables, etc.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:

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One room is currently being used for storage. All medical and laboratory equipment has been removed.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Due to extensive alterations to the exterior, Building 1200 no longer retains historic integrity. Recommend, however, that this building be considered as a contributing feature in a basewide early Cold War National Register of Historic Places Multiple Property nomination.

VII. ASSOCIATED BUILDINGS:

Building 1200 was an integral part of Holloman's aeromedical facilities, including Buildings 1201, 1202, 1203, 1204, 1205, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Since its original construction c1954, Building 1200 has been used as a laboratory and medical facility for a wide variety of research animals, including trout, black bear, dogs, mice, and chimpanzees. Although currently abandoned, this building featured a lead-lined x-ray room, an autopsy room, an observation room, a surgery room, a dark room, and animal pens (c1954: CE File #1200-1). Built-in steel lockers, metal cages, x-ray tables, work benches, food bins, operating tables, scrub sinks, surgical lamps, sterilizers, etc. have been removed. Two exterior doors have been blocked in, and thirteen exterior windows have been blocked in. One exterior door and one exterior window have been added. Interior walls have been added, removed, or relocated. A storage room has been added to the south elevation. Animal cages remain at the west elevation. The presence of dead rodents, foul odors, torn pipe and duct insulation (possible containing asbestos) and peeling paint (possible lead-based) represent hazards to health and safety. Because of the unique and important nature of the research conducted here, recommend that this building be nominated as a contributing feature as part of an HAFB early Cold War National Register Multiple Property nomination.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?
[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.
Comments: The building has been located at its present location since c1954.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?
[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact
Comments: Most of the original doors and windows have been removed. All of the equipment has been removed. Most of the original finishes have been obscured.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting
To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting
Comments: Continues to be situated in an isolated setting with the other Aeromedical facilities.

Materials: To what extent have the original materials used to construct this structure been retained?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Elevations have changed due to modified openings, an addition, and a covered passageway. Interior wainscot and cornice removed, wall tile added.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Exterior walls and cages remain intact. Some architectural features remain. Most of the original interior workmanship has been lost.

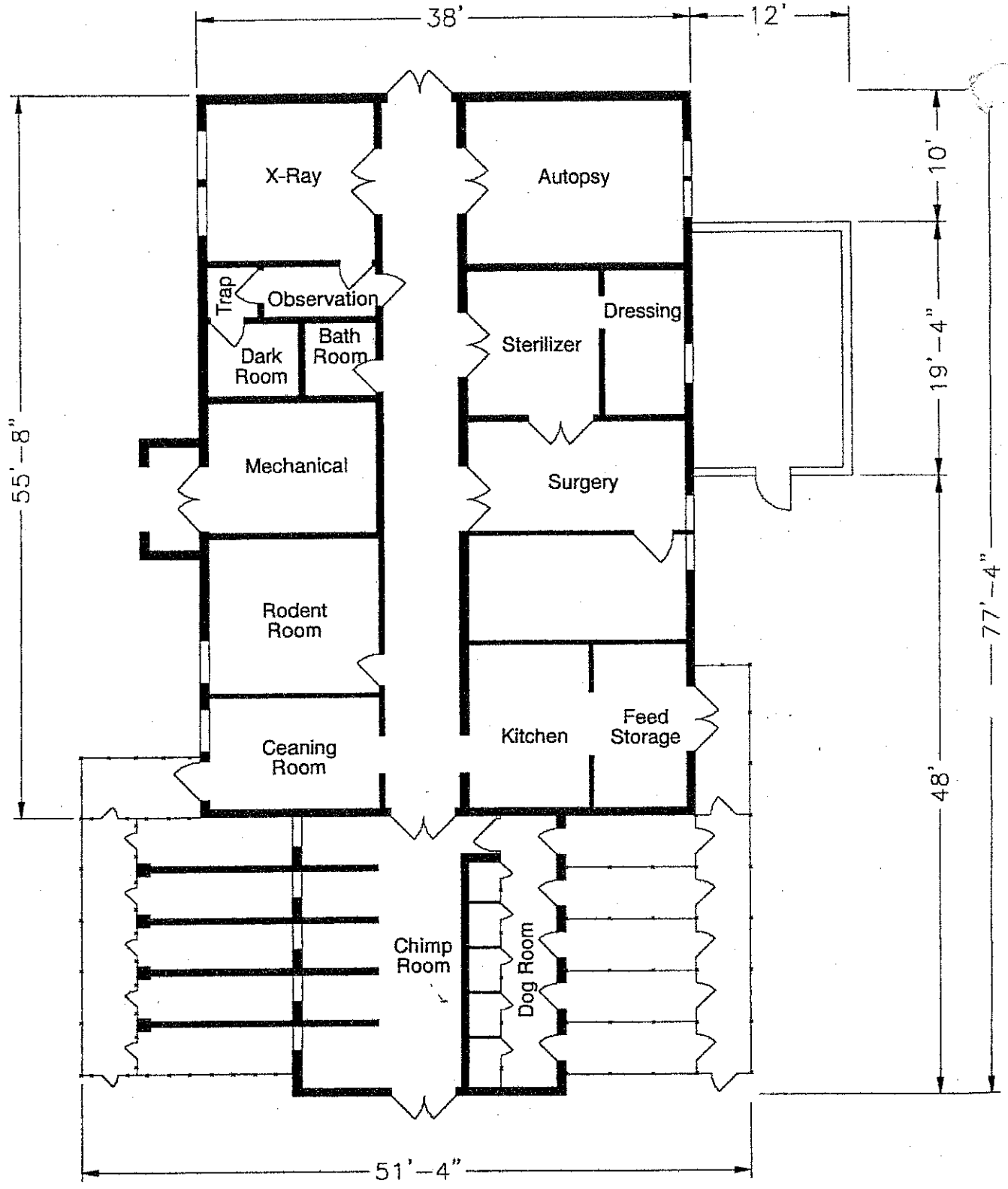
Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?
[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity
Comments: Building 1200 continues to be situated within the compound set aside for animal research. Chimpanzee research continues today in nearby buildings.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?
[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity
Comments: Although all of the equipment has been removed, this building still demonstrates a link with its past by virtue of its setting, the odors, and the animal cages.

X. FURTHER INFORMATION:

Surveyed By:
Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #94**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1200-1 (c1954)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1200** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

BUILDING 1201

Specifications and History: See "Cold War Survey"

Seven drawings were found for this building. These drawings show the Septic Tank and Absorbent Area Layout, Isometric Sewer Layout, Septic Tank Plan and Septic Tank Elevation (Attachment 17), Floor Plan (Attachment 18), Layout Plan (Attachment 19) and Systematic-Waste System (Attachment 20).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab Medical.
Historic: Aero. Medical Field Lab.
Street Address: 821 Douglas Road, HAFB, 88330-7823.

Building Number: 1201

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Structurally intact. In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

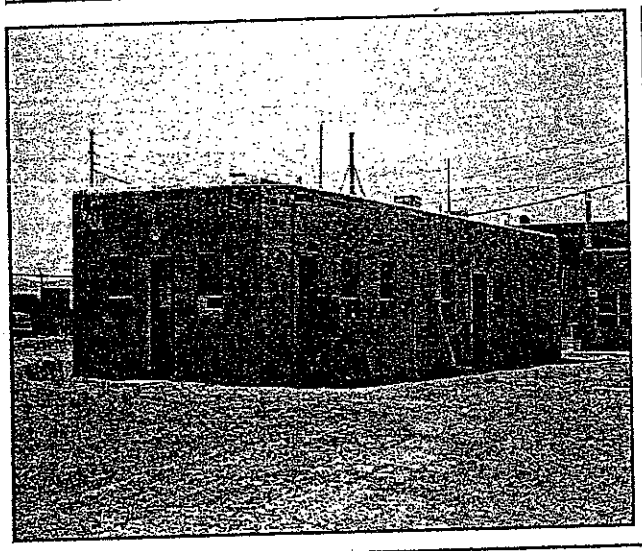
Comments: Mortuary/autopsy room added as subsequent improvement c1958.

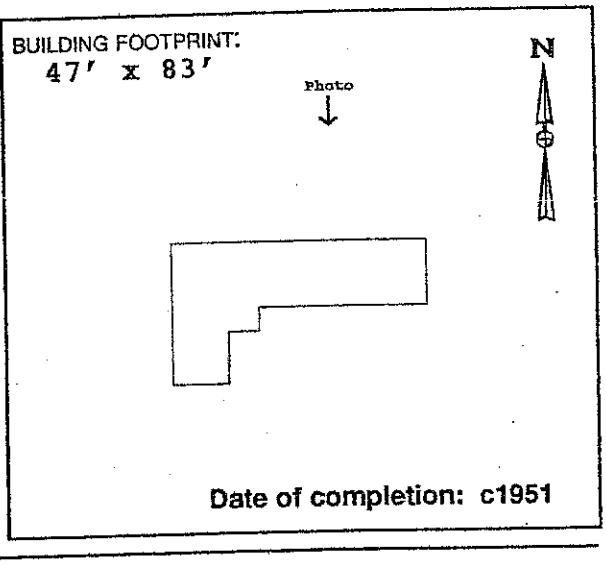
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible under Criteria A and/or C at a national level.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1951

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1201 is an "L-shaped", single-story, flat-roofed, building constructed primarily using painted 8" structural clay tile and exhibiting asymmetrical door and window placement. Animal cages occupy the west elevation. Real Property Accountable Record/1201 indicates that this science laboratory was constructed c1951. The construction drawings consulted were stamped "As-Built," although no date was given. Both the architect and builder are unknown.

At least two structural modifications may be viewed as subsequent improvements to the original building, including the addition of a Mortuary/ Autopsy Room (c1958: CE File #1201-4), and the addition of a rooftop observation deck (c1952: CE File #1201-5).

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1201.

Current Function: Carpentry shop; Employee break room; Office space.

Original Function: Aerospace Medical Lab; Animal experimentation.

Interim Functions: "SC Lab Human Eng" (n.d.); "SC Lab Med (c1968).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1201-1 (c1951).

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted structural clay tile.

Roof: Built-up roof w/ gravel on sheeting, supported by 2x12 wood joists.

Notable interior features, including machinery:

Fixed chain link cages, lab tables, equipment tables, work tables, wood storage bins, sterilizer, incubator.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL: (Based on field visit Summer 1995

[c1958 SUBSEQUENT IMPROVEMENT--MORTUARY/AUTOPSY]:

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted cement masonry unit (CMU).

Roof: 5-Ply built up roof on concrete slab. Steel joists.

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Notable interior features, including machinery:

Washer and dryer, kitchenette, tool room, table saw, furniture, lockers.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1201 is eligible to the National Register under Criteria A and/or C at a national level of significance for its vital role in early aeromedical research in support of the early Cold War space exploration mission.

VII. ASSOCIATED BUILDINGS:

Building 1201 was associated with the other Aeromedical facilities, including Buildings 1200, 1202, 1203, 1204, 1205, 1206, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1201 retains historic integrity as far as the structure itself goes. Very little physical evidence remains of this structure's original use as an animal laboratory. The cages have been removed. Two interior walls with doors have been added. One interior wall has been removed. Service sinks, work tables, wooden bins, an incubator, and other lab support items shown on c1951 construction drawings have been removed. An area of the original roof approx. 10' x 13' was reinforced with three inches of concrete for observation deck c1952 (CE File #1201-5). A mortuary/autopsy room was added c1958. These additions may be viewed as early improvements, and do not diminish Building 1201's historic integrity. Drawings itemize a "2-body" mortuary room, an autopsy table, a band saw, cabinets, a sterilizer, a photography area, and other laboratory equipment. This equipment has been removed. This room currently serves as a lounge area for employees. Due to the important research conducted here in support of this nation's space program, further research is warranted. Recommend that Building 1201 be included in a Cold War-era Multiple Property nomination. Suggested routine maintenance: This building is showing the signs of long-term neglect. Fill the stress cracks at the exterior corners. Scrape and paint exterior walls. Replace window glass and door hardware as needed.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Continues to be situated in an isolated compound.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Original structure essentially intact. Interior lab equipment and cages removed.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Enclosed by chain link fence topped with barbed wire, along with other research facilities. Chimpanzee research continues in nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Clay tile walls still intact. Some glass block windows remain. Some glass block windows blocked in when addition constructed. Floor tiles removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Roof, walls, and exterior openings remain essentially the same. The east elevation changed due to an early addition. Interior partitions, openings, and finishes have changed.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Historic photographs show that the natural, historic, and aesthetic character of Building 1201 has been retained.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

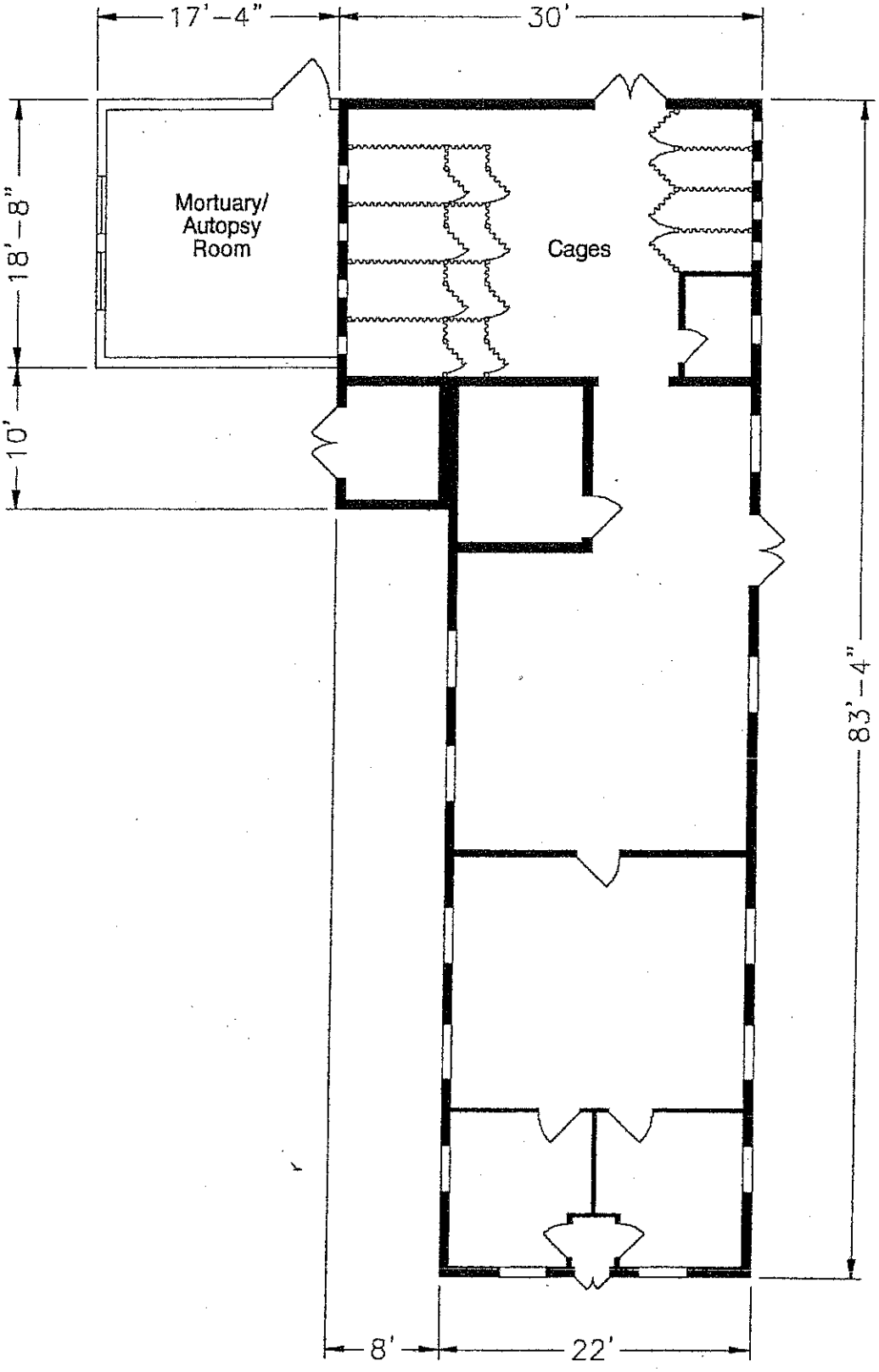
Comments: Building 1201 retains a visible link with its period of significance.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #91**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1995**



280

Source: CE File #1201-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1201** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

Buildings 1219, 1221, 1235 and 1239
An on site inspection was completed on 20 Dec 07 with the current facilities manager, TSgt Pote, he has been the facilities manager for the past nine years. During the inspection it was discovered that there are sink holes on all leach fields in the compound. All buildings in this compound have separate drains for the bathrooms. All buildings are also currently connect to the base sewer system.
Attachment 55d shows the leach field location for Buildings 1219, 1221, 1235 and 1239.

BUILDING 1219

This building is the Administrative Offices for the Munitions Maintenance Squadron. It was constructed in 1985 and covers 4476 SF.
There are Men's and Women's Bathrooms that discharged into two (2) septic tanks prior to the installation of a sewer main that discharges to the Base Waste Water Treatment Plant.

INACTIVE SEPTIC SYSTEMS

Building 1221

This building is in the Ammo Depot and was originally constructed for ammunition storage. It was later switched to store inert munitions.
The building was constructed in 1983 and covers 2857 SF.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan (Attachment 21), Floor Plan (Attachment 22), Partial Plan (Attachment 23), Septic Tank Details and Sewage Disposal System (Attachment 24) and a Profile of Sewer Line Septic Tank and Disposal Field (Attachment 25).

INACTIVE SEPTIC SYSTEMS

BUILDING 1226

This is a munitions maintenance shop building constructed in 1985. It has 2945 SF of floor space.
Facilities installed include:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Utilities Plan (Attachment 26), Plumbing Demolition Plan (Attachment 27), Plumbing and HVAC Plan (Attachment 28) and Waster/Water Piping Detail (Attachment 29).

In Figure 8 on the following page it can clearly be seen where the leach field is in relation to where building 1226. This is the leach field for building 1219, 1221, 1235 and 1239 as well. In Attachment 46 (a map showing many of the building on Holloman AFB) it can be seen where building 1226 is in relation to these building.

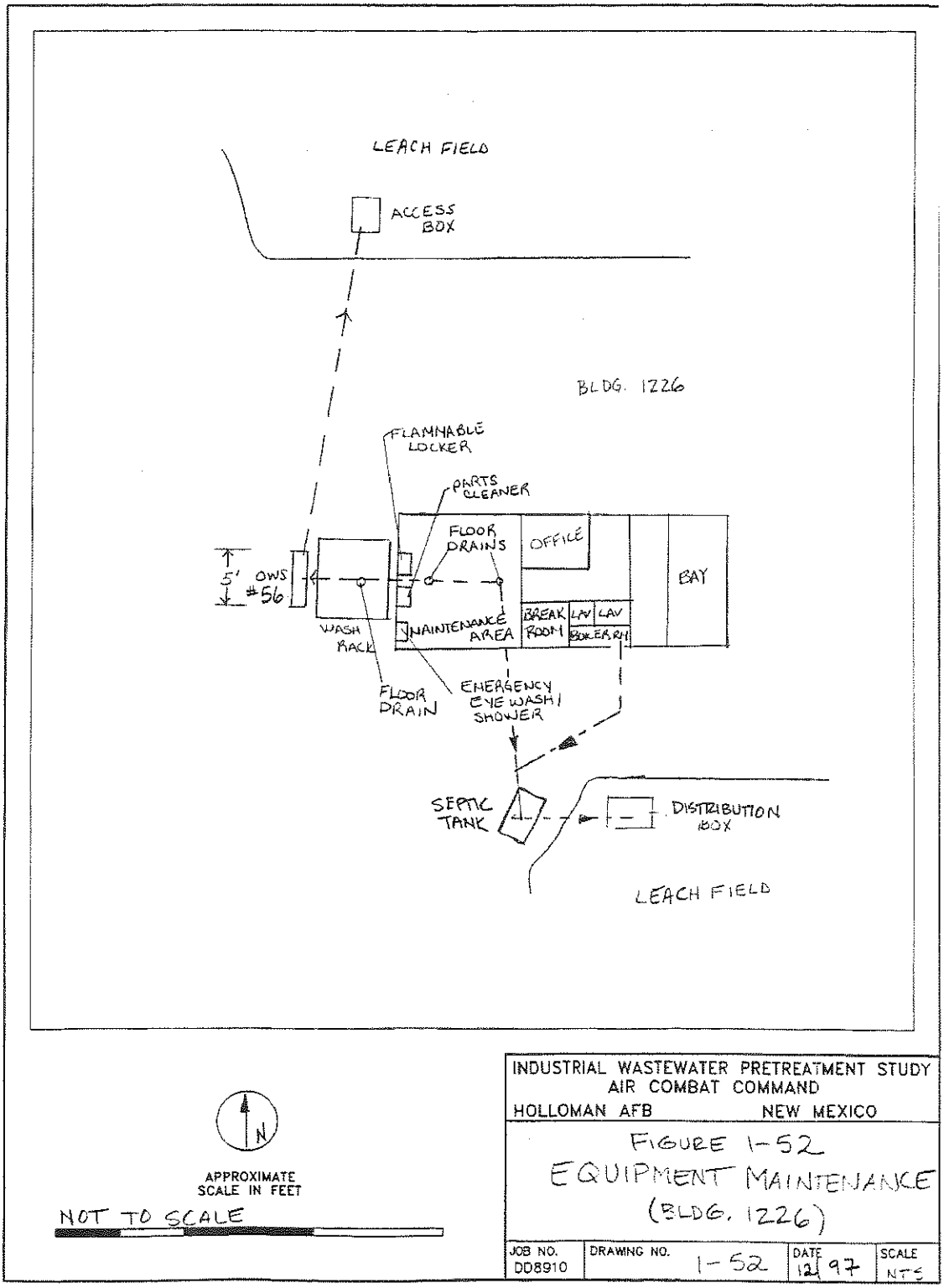


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Figure 8: Drawing of Leach field

INACTIVE SEPTIC SYSTEMS

BUILDING 1235

This building was constructed in 1964 and contains 3000 SF of floor space.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, a drawing for this building was also located. This drawing (Attachment 30) shows the Site Plan, Septic Tank Details and Sewer Clean Out.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST

INACTIVE SEPTIC SYSTEMS

BUILDING 1239

This is another building in the Ammo Depot. It was constructed in 1971 and contains 1920 SF.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Urinal
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan, Septic Tank Details, Utility Plan (Attachment 31), Floor Plan (Attachment 32), Grading Plan (Attachment 33) and Lavatory Detail (Attachment 34).

INACTIVE SEPTIC SYSTEMS

BUILDING 1250

This building was constructed in 1957 and contains 2890 SF.
It was originally a water pumping station. In 1985 it was changed into a storage facility. As part of the change in service the bathroom facilities were removed. Currently it has a large infestation of vectors and it is unsafe to go inside. The POC for this building is Mr. Chuck Price.
The original facilities consisted of:

- Toilet
- Lavatory
- Floor drains for the water pumps

INACTIVE SEPTIC SYSTEMS

BUILDING 1251

This building was constructed in 1965 and contains 1300 SF.
In the records it is listed as a Research and Testing Shop. It currently has a large infestation of vectors, therefore it is not safe to go inside. The building has been vacant since the mid 90's. The point of contact for this building is Mrs. Eisele.
It contains the following facilities:

- Toilet
- Lavatory

INACTIVE SEPTIC SYSTEMS

BUILDING 1269

This building was constructed in 1966 and contains 3262 SF.
The original service was a Medical Science Laboratory. It has been relegated to a storage facility.
The facilities consisted of:

- Toilet
- Lavatory
- Kitchen Sink with Garbage Disposal

Site Specific Contingency Plan: See Attachment 1

Max. Spill Quantity (gal): 55

Chemical	Container Type
Benzene	NA
Acetonitrile	

REMOVED SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	1102	1952	6'x4'x8'10"	2500
2	1103	1948	7'x9'x3'2"	1412
3	1108	1958	6'x9'6"x6'3"	750
4	1119			
5	1150	1953	4'x9'x6'3"	2500
6	1154			
7	1166	1960		450
8	1175	1949	5'1"x10'4"x6'10"	2970
9	1176	1959		640
10	1265	1992		1200
11	1173			

REMOVED SEPTIC SYSTEMS

BUILDING 1102

Specifications and History: See "Cold War Survey." More information can be seen in the drawings. The drawings that have been found for this building are as follows the Grading Plan (Attachment 35), Septic Tank Details and Boring Log Results (Attachment 36), Leaching Well and Cover Details and Sewer Clean Out (Attachment 37).

Attachment 55c shows where the leach field was located for this building in 1984.

This building has the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Missile Radar Station.
Historic: Radar Triangulation: King I.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1102

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

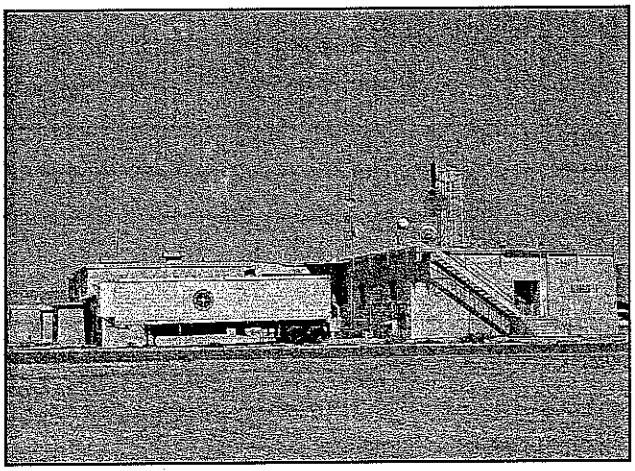
Comments: Essential structural and architectural features remain intact.

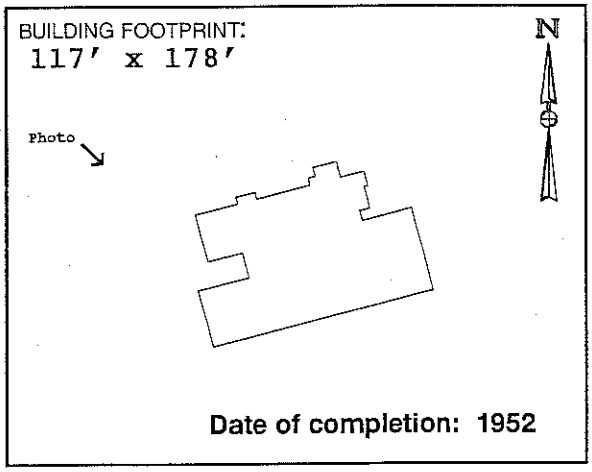
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Recommend listing as part of a Cold War Multiple Property.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1102 is a one-story concrete masonry unit, multi-shaped building with a central corridor running east-west the entire length and single rooms flanking both sides of the corridor. Original footprint shows primarily rectangular shape with a central projecting core. This core is a large open room with an upper balcony around its perimeter. Construction of the original building was completed in 1952, according to "As-built" drawings in CE File #1102-1. Surveillance display room added in 1969 (CE File #1102-1). It is unclear when north elevation additions constructed, although information in Real Property Accountable Record/1102 date the additions as being post-1970. The architect for this project was W. C. Kruger (Santa Fe, NM). The builder is unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1102.

Current Function: Telemetry and Optics. Altitude measurements.

Original Function: Missile Instrumentation Station; Mission Control.

Interim Functions: Missile Radar Station.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1102-1 (c1952).

Foundation: Concrete footing and foundation wall. Column spread footing.

Exterior walls: Concrete masonry units (CMU).

Roof: Bituminous concrete over built-up roof, ltweight concrete, supported by one-way concrete slab using concrete beams and steel beams encased in concrete.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

380

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Eligible under Criteria A and/or C at a national level of significance for important role in early Cold War-era missile and High Speed Test Track mission control and tracking. Further research recommended.

VII. ASSOCIATED BUILDINGS:

Building 1102 supported all missions at White Sands Missile Range and at Holloman Air Force Base until Building 300 and possibly 1527 at White Sands were constructed.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1102 continues to operate as a mission control building, with mostly optics and telemetry functions. The Flight and Instrument Control Room, and the Surveillance Radar rooms are vacant. Originally, missiles were fired using an analog boards (mechanical) system. When operations changed to a digital system in c1978, support moved from the central instrument control room to the north addition off of this room. Nearly all of the original interior finishes remain unchanged.

Suggested routine maintenance: Scrape, prime, and paint all block and concrete surfaces. Remove vegetation and rusted pipes by gas meter. Fill depressions at foundation, and regrade using gravel to promote positive drainage. Fill holes at concrete stoops. Replace wood bumper at dock using similar-sized lumber. Secure panel covers on abandoned electrical panels. Enclose live connections in junction boxes. Scrape, prime, and paint metal stairs. Reattach stair nose treads. Remove miscellaneous debris from building perimeter.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Still situated at the northeast corner of the intersection of Tula Peak Road, and Douglas Road.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The original floor plan remains intact.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Continues to be situated at the intersection of two roads in an isolated setting with few nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Most all original materials have been retained at both the exterior and the interior.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: All original exterior and interior room finishes remain visible. At the south elevation, one window is blocked, one window has been replaced with a door, and the door at the loading dock has been replaced. Most of the north elevation is obscured by the addition of an operations room.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1102 continues to support limited mission control operations.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

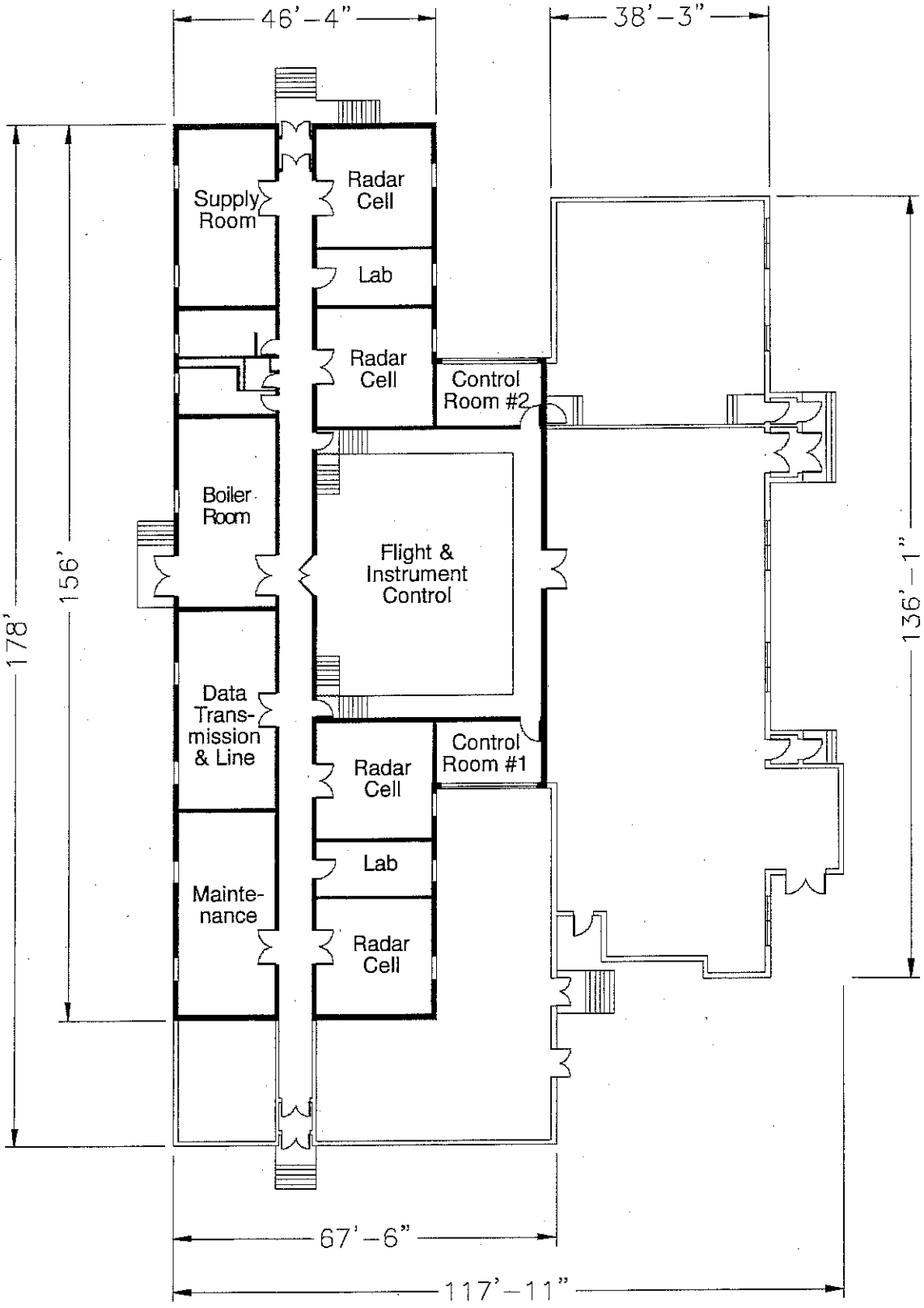
Comments: Building 1102 retains an evident link with its aesthetic and functional historic character.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #49**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1102-1 (c1952)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1102** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-6401* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1103

Specifications and History: See "Cold War Survey" the Layout Plan (Attachment 38) has also been provided.

Attachment 55c shows where the leach field was located for this building in 1984.

Facilities: This building contains the following facilities.

- Tiolets-2
- Urinals-2
- Lavatories-3
- Service Sinks-3

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Timing.
Historic: Telemetering Building.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1103

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance only.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

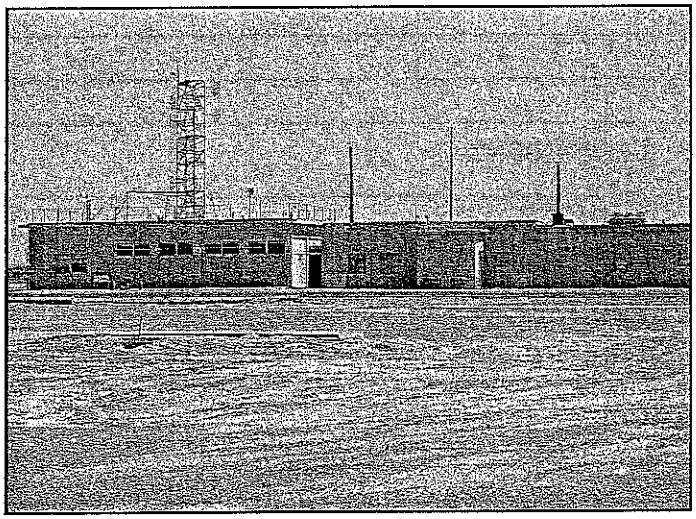
Comments: Few alterations since early improvements.

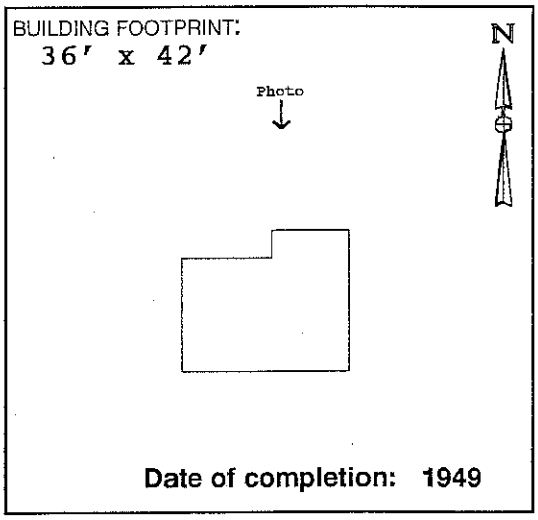
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Research recommended to determine historic use. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1103 is a one-story rectangular building with concrete masonry unit walls, and a flat roof. The original building was completed in 1949, according to "As-built" drawings located in CE File #1103-1. This original construction is centrally located, flanked to the east and west by subsequent additions. Real Property Accountable Record/1103 documents the addition of 2,930 square feet to the original building with the notation "Subsequent Improvements thru May 57." One or both additions to the original building may therefore be considered to be subsequent improvements, rather than additions that compromise historic integrity. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE: (Personal communication with Building 1103 personnel)

Current Function: (East end) Leased by WSMR to transmit mission timings.

Current Function: (West end) Unknown.

Original Function: Telemetering station for data collection of Range missions.

Interim Functions: Real Property Accountable Record/1103: "Communications CTR" (c1962); "Telecom Cen" (c1971); "Comm Fclty" (c1980); "Elec Rsch Rdr" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1103-2 (1967); CE File #1103-1 (1949).

Foundation: Concrete wall footing.

Exterior walls: Painted concrete masonry units (CMU).

Roof: Built-up roof on wood sheathing and 2 x 8 wood joists.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Although perhaps not meeting the "exceptional importance" stipulation imposed on buildings constructed within the last fifty years, Building 1103 may be eligbile for the National Register under Criterion A at a regional or national level in the year 1999. If further research determines that Building 1103 is not eligible as an individual property, consideration should be given to its eligibility as a contributing feature in a Cold War Multiple Property submission for its support of early Cold War-era test launches.

VII. ASSOCIATED BUILDINGS:

Building 1103 was associated during its historic period of significance with Building 1102, mobile data collection vans, and Building 300 at White Sands Missile Range.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1103 appears very different today from depictions on "As-built" drawings dated 1949. It is unclear whether additions to the east and west ends of the original building represent early improvements to the original building, or whether these additions represent later construction that has compromised the historic integrity of the original building. Information obtained from Real Property Record/1103 and field visits seems to indicate that the additions represent early improvements to the original building. If so, Building 1103 retains historic integrity. Further research is needed to verify the construction sequence, and to verify what early Cold War-era research activities were supported by Building 1103. Currently, Building 1103 is leased by the White Sands Missile Range. Aside from minor partitioning at the telemetering room, the original floor plan of the original building shows no alterations. Wood posts (6 x 6) that appear on original drawings to support the roof girders have been removed.

Suggested routine maintenance: Repair, or replace in kind, the exterior wood architectural features, including the soffit, fascia, wood doors, and louvers. Patch spalling concrete at foundation. Remove vegetation at roof.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Original telemetering room is now used as spare equipment storage.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Earlier location plans indicate three utility buildings situated in a row next to Building 1103 to the east. These buildings have been removed. Continues to be set in a somewhat isolated setting, in the vicinity of King-I.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Unable to access some rooms. Those rooms that were accessed, however, appear to have most of the original materials intact. A brick chimney and a metal stack have been removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original windows at north elevation have been covered up at the interior. The telemetering room has been partitioned (reversible).

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity

Comments: Building 1103 personnel are actively engaged in serving as a timing link for White Sands Missile Range tests.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

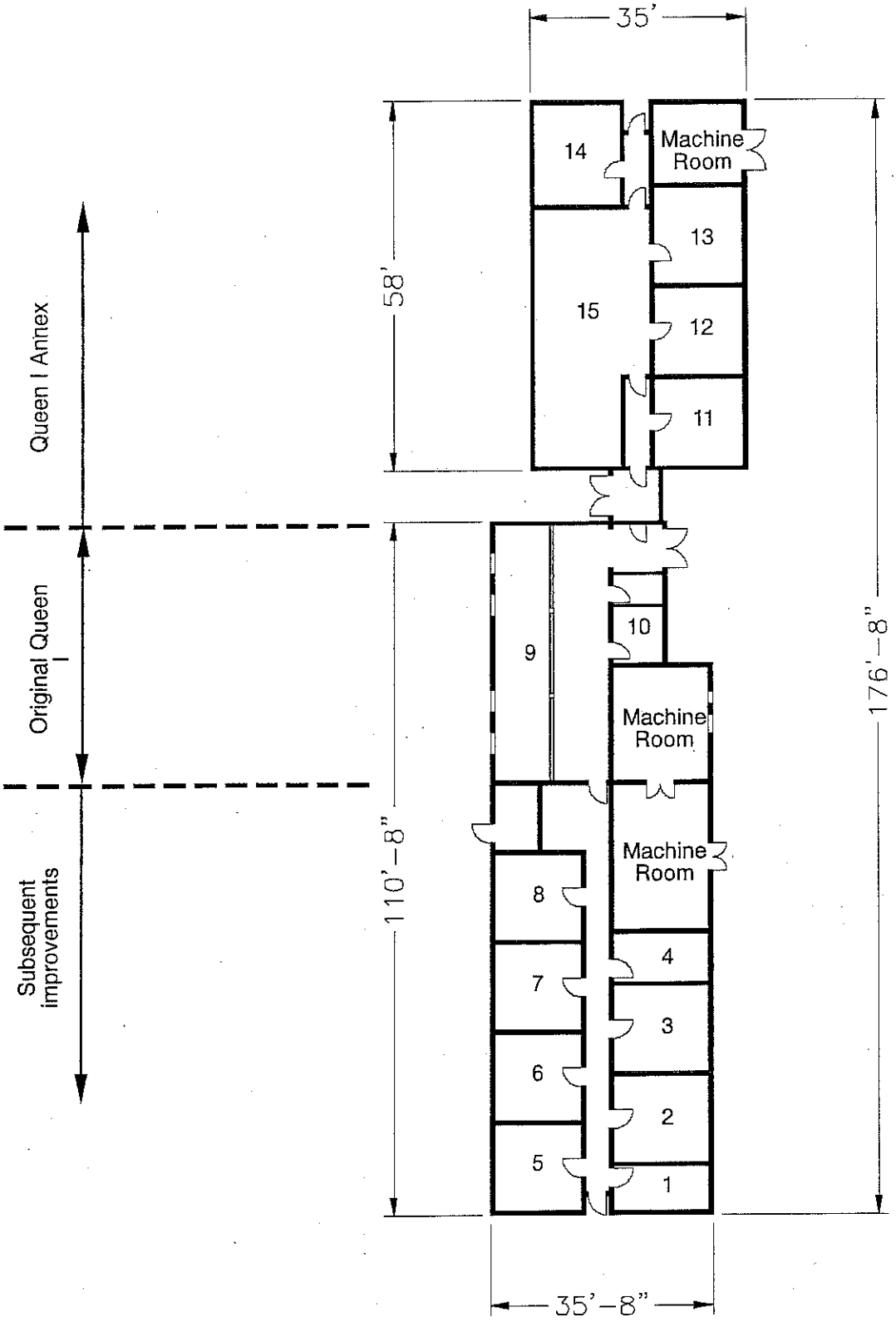
Comments: Building 1103 continues to provide support to the White Sands Missile Range.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #47**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: Dynalectron *Facilities Handbook*, c1964.

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1103** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1108

This building was constructed in 1958 and contains 2626 SF of floor space.
The building was originally built to serve as the telephone exchange. In 1980 it was retitled as a communications facility.
The building contains the following facilities:

- Toilet
- Lavatory
- Janitorial Sink

The drawings provided (Attachment 39-40) show a Utility Plot Plan, Septic Tank Details, Sewer Clean Out, Toilet Room Details and Plan Details.

Attachment 55e shows where the leach field was located for this building in 1984.

Site Specific Contingency Plan: See Attachment 1 and 2

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate into local area on ground

Tank location: North of facility

Fuel Flow - North

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST
MOGAS	250 gal each/ 2 /AST

REMOVED SEPTIC SYSTEMS

BUILDING 1119

This is an Army owned building that contains 2224 SF of floor space. Use and maintenance of the building was transferred to the Air Force in 2005. Prior to the Air Force taking possession the Army had delegated the building to the GSA for use as a vehicle maintenance shop. Once the Air Force took over, the building changed service to an electrical shop and storage facility.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
Diesel	250 gal ea/ 3 /AST
MOGAS	250 gal ea/ 2 /AST
Diesel	750 gal ea/ 3 /AST

Figure 9: Picture of Bldg 1119

REMOVED SEPTIC SYSTEMS

BUILDING 1150

This is also an Army owned building and therefore details are lacking from Holloman's records. The building has 2844 SF.
The original service is unknown, but since the Air Force started using the building it has been used as storage space.
It contains the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 9: Drawing of Bldg 1150

REMOVED SEPTIC SYSTEMS

BUILDING 1154

This is an Army owned building and there is no information in Holloman's files pertaining to this building.

Attachment 55c shows where the leach field was located for this building in 1984.

REMOVED SEPTIC SYSTEMS

BUILDING 1166

This building was constructed in 1960 and contains 4955 SF. The structure is a Test Track Shop/Storage Building known as the "Break Setter Building".
The facilities include:

- Toilets-2
- Urinal
- Lavatory
- Shower

Attachment 41 is a drawing showing the sewer layout and the septic tank details.

Attachment 55c shows where the leach field was located for this building in 1984.

Site Specific Contingency Action: See Attachment 3

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate in local area on ground; if full tank or drum spilled' the substance may reach open ditch.

Material Compatibility: No material incompatibilities

Chemical	Container Type
Oil/Water Separator Waste	500 gal/ 1 / UST

Figure 10: Picture of Bldg. 1166

REMOVED SEPTIC SYSTEMS

BUILDING 1175

Specifications and History: See "Cold War Survey"
Facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

In Attachments 42-44 a trench pit, the toilet room details, the trench junction to UPS, the sanitary sewer manhole and water and sewer piping can be found for Bldg 1175.

Attachment 55c shows where the leach field was located for this building in 1984.

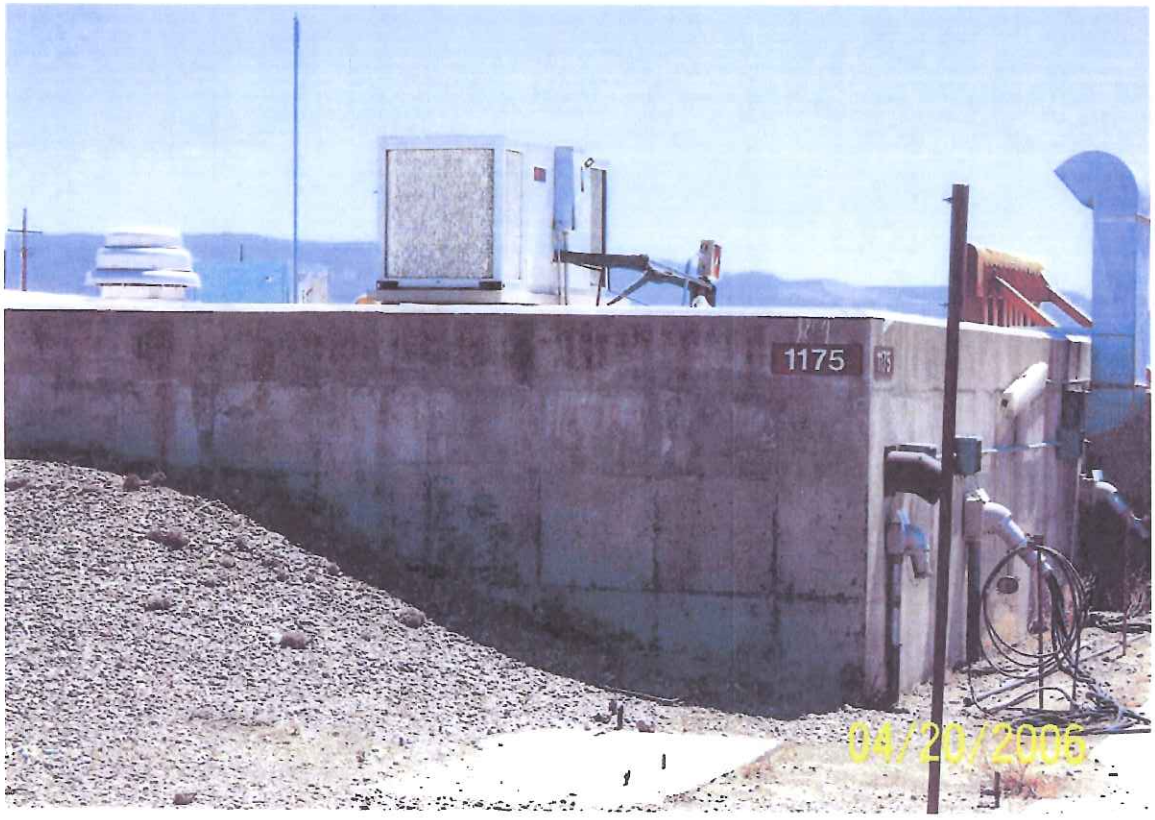


Figure 11: Picture of Bldg 1175

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Blockhouse--"Alpha".
Historic: Blockhouse--"Alpha".
Street Address: 1656 Test Track Rd., HAFB, 88330-7848.

Building Number: 1175

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1175 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

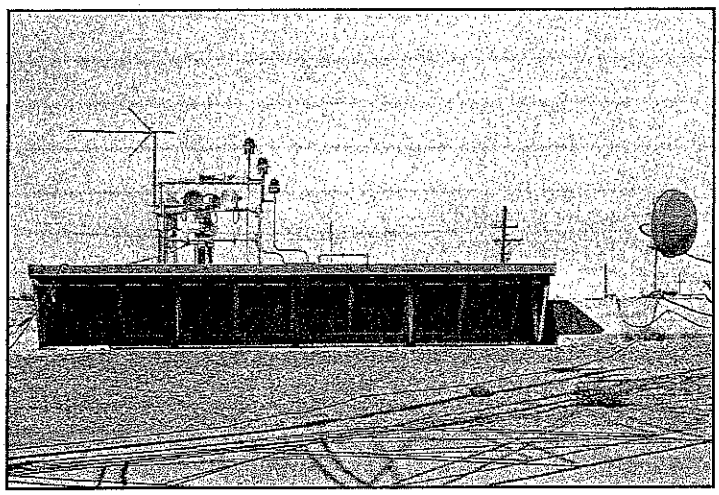
Comments: Modernization at interior to enable continued Test Track use.

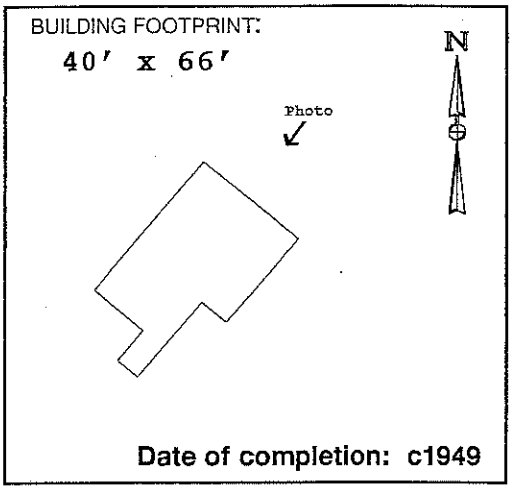
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible for the National Register under Criteria A and/or C.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1175 is an irregularly shaped, one-story concrete structure, built mostly below grade. The building is accessed by a ramp leading down to double doors at the southwest elevation. These doors access the original launch control room constructed in c1949. This entrance, three entrances off of the ramp, and windows facing the track (northeast) are the only visible openings. A 15′ x 32′-6″ addition was constructed at the northwest elevation in 1960 (CE File #1175-2). Another addition, adjacent to northwest side of ramp was completed in 1981 (CE File #1175-3). The ramp extension was also constructed at this time. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1175; CE File #1175-1 (c1949).

Current Function: Launch control facility, High Speed Test Track.

Original Function: Launch control facility, High Speed Test Track.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1175-1 (c1949); CE File #1175 (c1980).

Foundation: Concrete footings.

Exterior walls: Reinforced concrete.

Roof: 3-foot thick reinforced concrete.

Notable interior features, including machinery:
A long row of thick blast-proof windows faces the track to the northeast.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

366

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

"Alpha" Block house Building 1175 is one of the original High Speed Test Track support facilities, constructed c1949 to provide launch control. Recommend that Building 1175 be nominated under Criteria A and C as part of a basewide early Cold War Multiple Property listing.

VII. ASSOCIATED BUILDINGS:

Building 1175 operated, and continues to operate, in support of the high speed test track launching activities, along with Buildings 1162, 1163, 1161, 1645, and the Horizontal Test Stand facility (Buildings 1159 and 1160).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1175 retains historic integrity. Due to its national level of significance under Criteria A and C, recommend that Building 1175 be listed along with the other test track support buildings as part of a Multiple Property nomination to the National Register of Historic Places.

Subsequent improvements to the original Building 1175 augmented the original design and function as a launch control facility for important research conducted at the high speed test track. The interior was renovated in 1984 (CE File #1175-4). Although this renovation obscures original interior finishes, Building 1175 as a whole retains historic integrity of location, design, setting, workmanship, materials, feeling, and association. Of interest to future researchers may be the dramatic changes in computer technology which have occurred since the construction of Alpha Blockhouse: Computers which at that time required several rooms to house, now occupy considerably less space. Launch control operations continue at Alpha Blockhouse, although rooms designed to hold early equipment are virtually empty.

Suggested routine maintenance: Repair bond beam where steel is exposed. Remove vegetation at exterior embankments. Remove debris at front walkway.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Subsequent improvements to the original floor plan added to Building 1175's design and function as a launch control facility.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Except for the construction of smaller buildings in the vicinity, the original setting of Building 1175 near the test track launch pad has been retained.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: The raised wood floor in the console room has been removed. The original light fixtures have been removed. One wood and glass partition has been removed. Sheetrock® walls, carpeting, wainscot, and linoleum have been added to the control room.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original workmanship at the northeast elevation, and at the entrances at the ramp is still visible. Interior renovations hide the original architectural craftsmanship.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1175 continues to function as a launch control facility for the High Speed Test Track.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

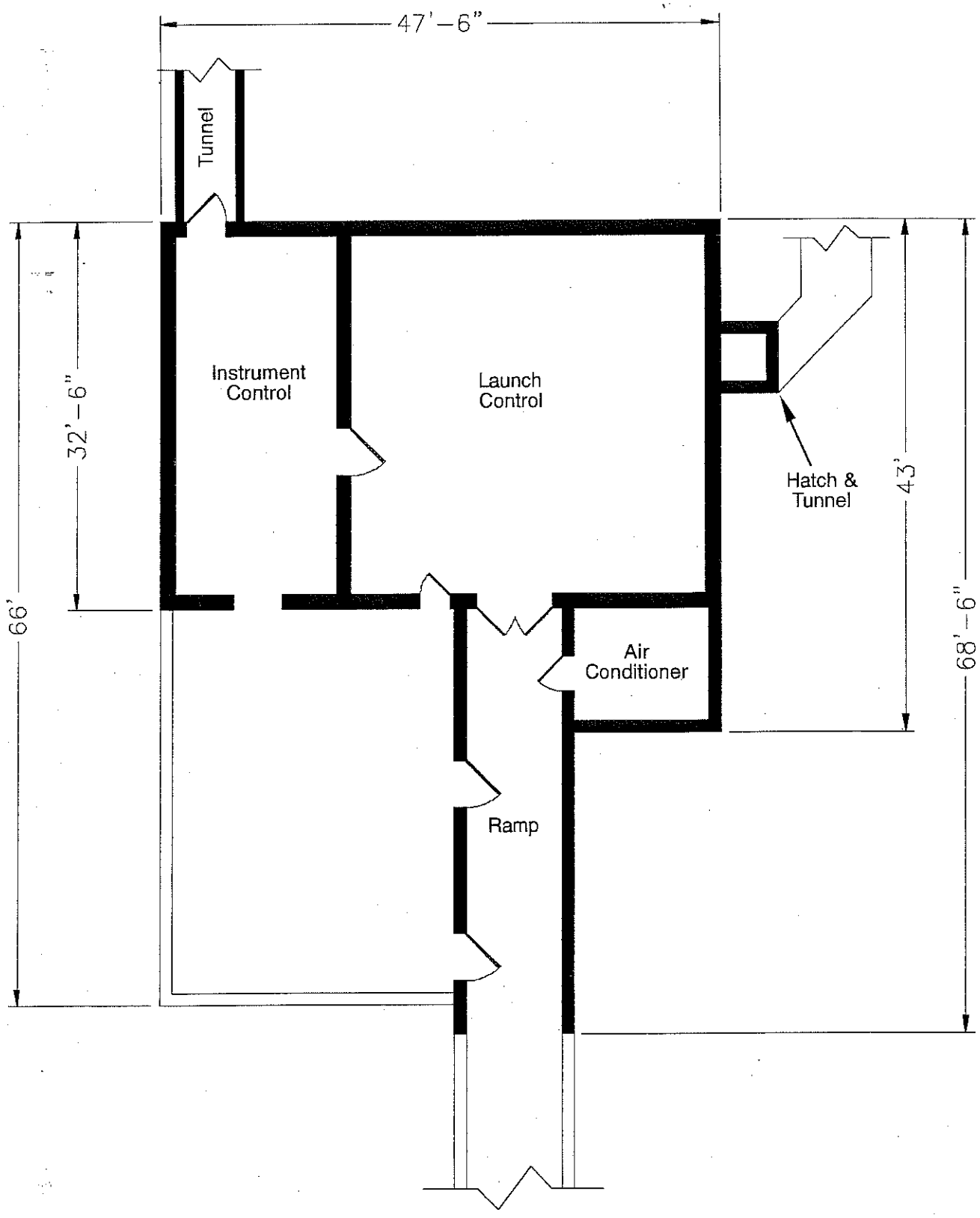
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #35**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1175 (c1980)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1175** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1176

This building was constructed in 1959 and contains 3850 SF.
The building is located at the Test Track and is known as the Sled Launch Shop.
Facilities include:

- Toilet
- Lavatory
- Shower

In Attachments 45-48 a plumbing plan, new drain pit, utility plan, sewer clean out, utilities contour plan and septic tank details can be found for Bldg 1176.

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 12: Picture of Bldg 1176

REMOVED SEPTIC SYSTEMS

BUILDING 1173

This building was constructed in 1957 and contains 17,428 SF.
The building is the main office building at the Test Track.
It contains the following facilities:

- Toilets-8
- Urinals-4
- Lavatories-9
- Janitorial Sinks-2

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 13: Picture of Bldg 1173

REMOVED SEPTIC SYSTEMS

BUILDING 1265

This building was constructed in 1957 and covers 43,388 SF.
This is the Inertial Guidance Facility, previously known as the Guided Weapons Lab.
The building contains the following facilities:

- Toilets-12
- Urinals-6
- Lavatories-12
- Janitorial Sinks-5

This building has been attached to the sewer system at Holloman AFB since before 1984.

In Attachments 49-53 a Water Piping Diagram, Partial Plumbing Plan, Floor Plan, Building, Pavement and Utilities Layout, Sewer Clean Out, and Enlarged Plan can be found for Bldg 1265.

North Wind

Letter No. NW-2008-155

Mr. Dave Griffin
Project Manager
49 CES/CEV
550 Tabosa Ave.
Holloman AFB, NM 88330-8458

11 March 2008

SUBJECT: Technical Memorandum summarizing the decommissioning of inactive septic tanks at HAFB in January of 2008

Dear Mr. Griffin:

Reference Contract Number: W9128F-04-D-0017 DO-0017

Attached please find a copy of the above referenced Technical Memorandum and attached State of New Mexico On-Site Liquid Waste System Abandonment forms. Also attached are copies of the daily reports for the field work.

Please contact me (phone 785-838-3141 or email at tmatzen@northwind-inc.com) or the Program Manager, Rusty Gilbert (phone 210-722-4074 or email at rgilbert@northwind-inc.com) if you have any questions.

Sincerely,

Thomas A. Matzen, P.G.
Project Manager
North Wind, Inc.

Attachments: Technical Memorandum summarizing decommissioning work conducted on inactive septic tanks at HAFB

cc: R. Gilbert (North Wind)
Mr. Tom Zink (USACE Omaha District)
Letter File

North Wind

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
9	1194	01/09/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
10	1196	01/08/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
11	1199	01/09/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
12	1200	01/11/08	No septic tank located. Did locate abandoned earthen pit with a concrete cover. Notified Base POC of situation and received instructions to backfill and abandon.	Removed concrete cover over pit and backfilled pit with clean fill.
13	1201	01/11/08	No septic tank located. Did locate an old abandoned treatment plant. Notified Base POC of situation and received instructions to decommission and backfill the old treatment plant.	Demolished old treatment plant by crushing bottom and caving in sides, then backfilled with clean soil.
14	1219	01/18/08	Septic tank still in use	Notified Base POC that system is still in use
15	1221	01/18/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
16	1226	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.
17	1235	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.
18	1239	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
ON-SITE LIQUID WASTE SYSTEM ABANDONMENT

NMED Permit No.: N/A

System Owner's Name: USACE

Address: HAFB BUILDING 1201

BUILDING SEWER:

_____ Connected to Sewer Lines or Plugged/Capped based on UPC Requirements

ON-SITE LIQUID WASTE SYSTEM TYPE:

- [X] Septic Tank
- [ ] Seepage Pit
- [ ] Sec./Tert. Treatment Unit
- [ ] Other:
- [ ] Holding Tank
- [ ] Cesspool

ABANDONMENT PROCEDURE:

- [✓] System Pumped
- [✓] Bottom of System Opened or Ruptured or Unit Collapsed
- [✓] System filled with Earth, Sand, Gravel, Concrete, or Other Approved Material
- [✓] Top Cover Removed or Collapsed
- [✓] System Filled to the Top of Sidewalls or above the Level of any Outlet Pipe
- [✓] System Filled Level with Top of Ground Surface

COMMENTS/VIOLATIONS:

Elevation 4096 Ft GPS: N32.87194
W 106.08844°

ABANDONMENT PERFORMED BY:

Company Name: Montel Septic Co.

Address: PO Box 927 La Luz NM 88337

NMED ACTION TAKEN:

- [ ] Abandonment **Approved**
- [ ] Abandonment **Approved w/conditions** (See Comments/Violations)
- [ ] Abandonment **Not Approved** (See Comments/Violations)

FINAL APPROVAL:

- [ ] Granted
- [ ] Not Granted

NMED Inspector Date

OK - If Abandoned and meets Requirements	N/C - Not Compliant
N/I - Not Inspected	N/V - Not Verified
N/A - Not Applicable	

BLOC 1201

BLDG 1201

BLDG 1201

BLDG 1201

Appendix B
Photographic Log

Appendix B
Photographic Log
Building 1201 (OT-C538)

Photo No.	Task and Description
1	Influent Line to Septic Tank – Building 1201
2	Septic Tank – Building 1201
3	Septic Tank and Leach Field – Building 1201
4	Leach Field – Building 1201
5	Leach Field – Building 1201

PHOTO 1: Influent Line to Septic Tank – Building 1201

PHOTO 2: Septic Tank – Building 1201

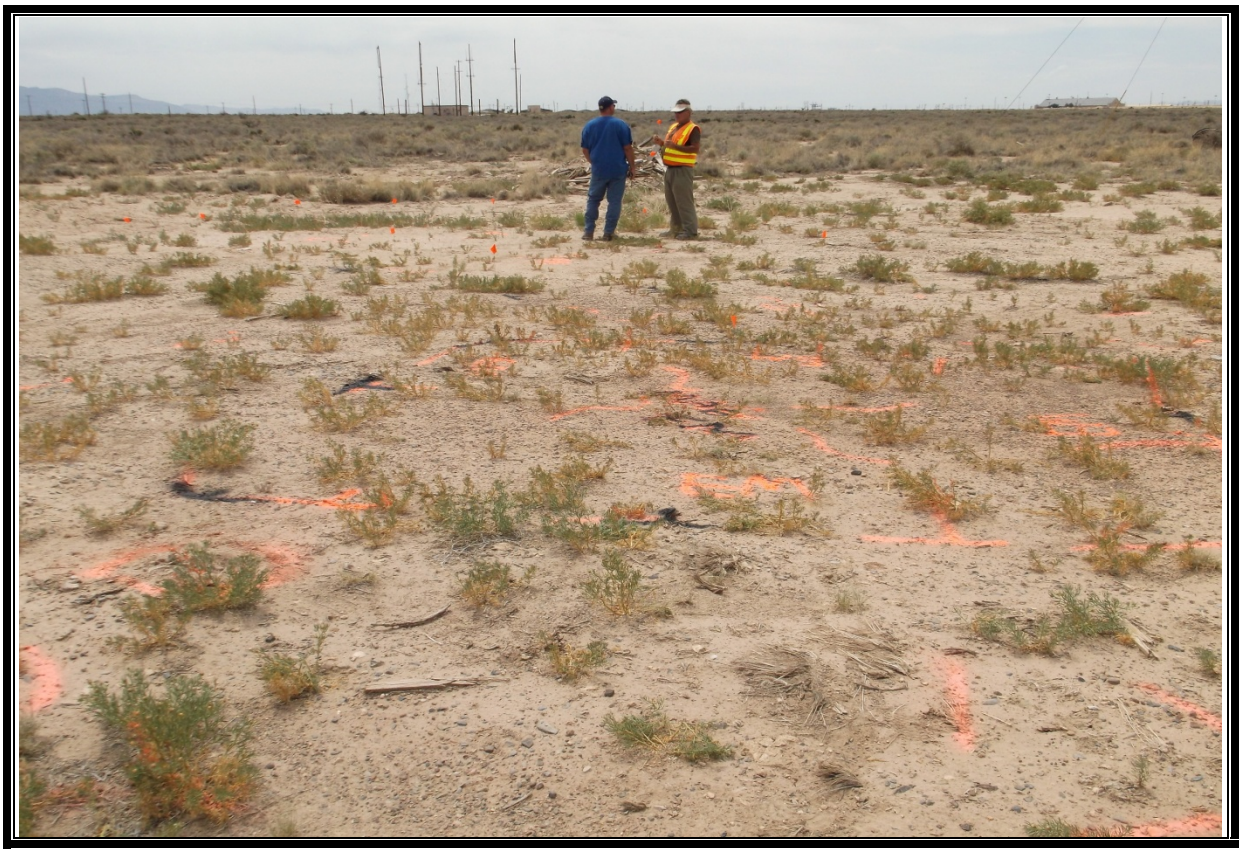


PHOTO 3: Septic Tank and Leach Field – Building 1201

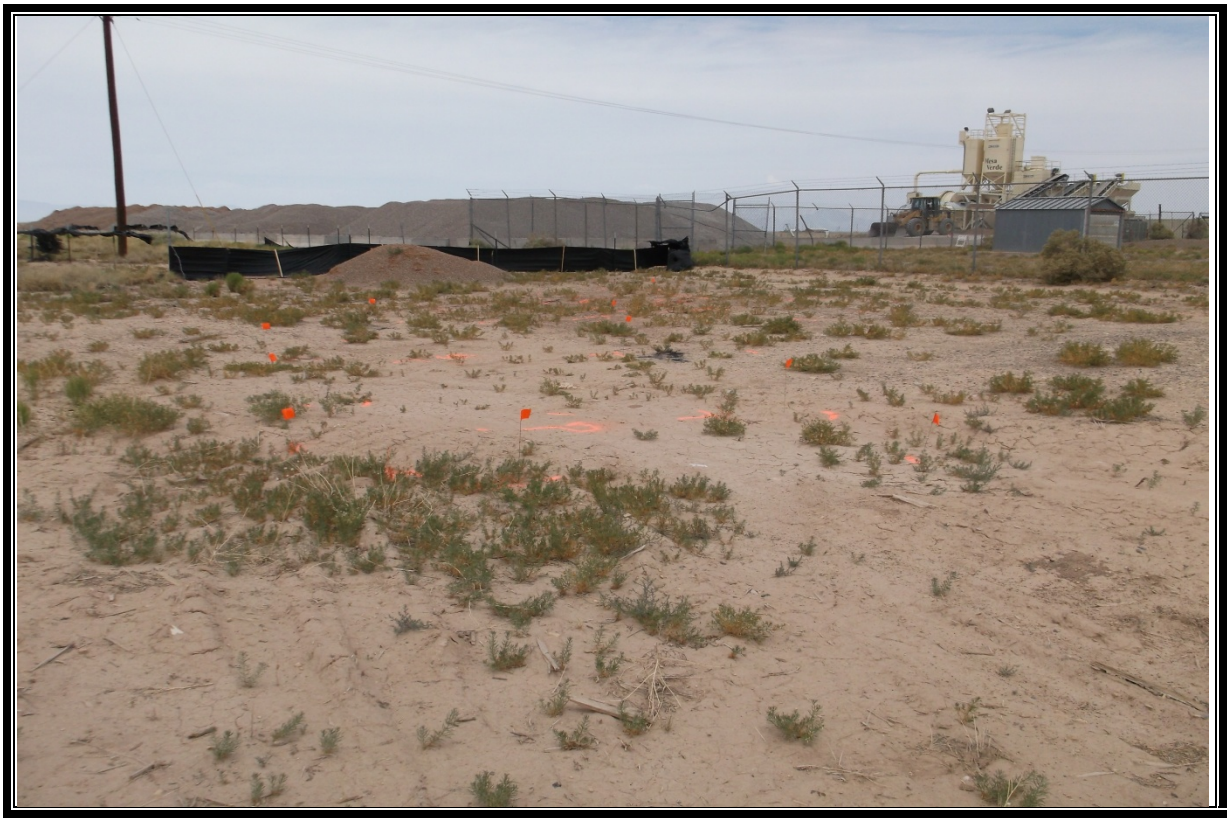


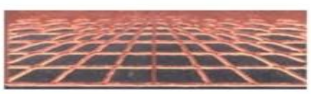
PHOTO 4: Leach Field – Building 1201

PHOTO 5: Leach Field – Building 1201

Appendix C
Geophysical Report

ULS SERVICES CORPORATION

GEOMARKOUT LOCATING Co a tradename



SAN DIEGO–LA . SF- SAC . SEATTLE . ALASKA . HAWAII- GUAM

1 (800) 528 – 8206 www.geomarkout.com 1 (866) 804 – 5734

---------- *A Veteran Owned Small Business* ----------

5 July 2012

Christopher Long, P.G.
Scientist
Federal Services
Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, TX 77077

Subject: Field Documentation Report for Geophysical Services -
Location of Utilities and Underground Features Associated
With Former UST and Septic System Sites,
Holloman AFB, NEW MEXICO (SHAW PO 783916-000 OP)

Gentlemen:

This report documents the recent Geophysical Survey field work ULS Services Corp completed at the subject site On and between the dates of 11 June 2012 thru 23 June 2012.

SHAW / ULS SERVICES CORP
GEOPHYSCIAL SERVICES
FORMER UST AND SEPTIC SYSTEM SITES
5 JULY 2012

SCOPE OF WORK

Scope of this work is includes geophysical services at approximately 29 Former UST or Septic Systems sites located across Holloman AFB that have reportedly undergone past abandonment in place or excavation activities. Geophysical services are employed in an attempt to locate potential USTs, former UST excavation areas, abandoned septic tanks or excavations and associated leach field areas. Location of underground utilities near these observed features is included. Observations are marked out in field and electronically mapped with GPS data collection and GIS presentation. Survey of each site is approximately 25 by 25 to 100 by 100 feet in size.

METHODS

Methods utilized in performance of this work include: Visual Inspection, Analog Real - Time Electromagnetic Induction Conductivity Detection (EMICD), Magnetic Locating (MGL), Ground Penetrating Radar (GPR), and EM Pipe and Cable Location (EMPCL). A sub-meter WAAS GPS receiver with automatic real -time differential correction and ESRI Arcpad software is utilized to collect observation data. ESRI Arc View 10 GIS software is utilized for mapping presentation.

EMIMD ground induction methods are employed to detect both 1) broad metal mass anomalies (Rectangular Surface Projections) or conductive zones that may be indicative of potential USTs – Septic tanks, conductive metal debris, steel reinforced concrete, UST's, building hosts, piping, building demo materials, drums, sumps or other unknown burial materials; and 2) to detect relative lateral changes in conductive zones of soil or backfill materials relative to native soils. Former UST excavations and septic -leachate material may potentially have a higher conductive response or well drained leachate fill materials associated with septic systems may in some cases exhibit a relatively lower or quiet conductive response relative to surrounding higher conductive soil response. A two-way Cartesian grid pattern of five by five feet is walked within the search area (site). Observations are real time and marked on ground surface with paint and pin flagging. Observations are collected with a sub- meter GPS with automatic differential correction and plotted approximately onto web based imagery.

GPR is utilized to detect and potentially observe former UST excavation sidewalls as well as septic – leach field pit sidewall and fill areas. GPR is also utilized to compliment the EM Pipe and Cable utility survey work by potentially locating conductive as well as non-conductive utilities.

A EM Pipe and Cable Survey is conducted at each site by performing ambient passive live power and communication line sweeps, active ground induction sweeps, and active direct- connect or induction- clamp sweeps using existing conducts or pipes visibly nearby. Multiple active frequencies are utilized for best Detection. Utilities are identified where possible and marked unknown if not identified.

All observations are marked with hi-visibility orange-red marking paint. Some Ares are hi-lighted with black paint due to light soil conditions. GPR boundaries indicating potential septic tank and leach field areas are outlined with black paint. Pin flags are also utilized to mark these boundaries in soft soil and weed areas.

OBSERVATIONS

Site Description

The Project Site (Holloman AFB - Former UST and Septic Systems) is comprised of approximately 29 different environmental site locations (heir in referred to as Sites) . Each sites includes and varies in description from existing active building locations to in-active remote abandoned to former building areas where USTs or Septic systems were utilized in the past. Each Site is fairly flat with sandy to gravelly surface conditions. Some sites include native brush and weeds. Sites near active building areas include asphalt or concrete surfaces, sidewalks and planter areas. ULS field staff helped review historical documentation available of each site in the field. Where available, drawings and photographs were reviewed. When available, reported GPS coordinates from reports, of septic tank locations, were utilized by SHAW field staff to navigate to septic tank location to aid focus search area.

Generally there are no surface indications of USTS or Septic tanks, however some limited features exist at some sites and include potential vent riser pipes and asphalt patching, settling areas, and conidial – rectangular cracks in concrete. Surface indications of septic systems at some sites include potential inactive clean- outs pipes near building and nearby existing upgraded sewer man-hole systems that have been connected to the existing Base sewer collection system. Some septic system sites have open holes , surface erosion, and associated potential underground voids observed near the inactive cleanouts and suspected septic search area.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

General ambient or background EM conditions at this site are categorized as being high or noisy most likely resulting from caliche or saline soil conditions throughout the area. These conditions all result in a high ambient background EMICD response that are difficult to filter out, however, subtle to distinct lateral changes are observed potentially marking position of former UST excavations. Magnetic locator is not affected by saline conditions. GPR response in these conditions is poor to somewhat fair, however, subtle, trends in GPR observations exhibit dipping or high angle (from horizontal) refraction bands indicating potential soil side-wall trends allowing for location of approximate former excavations. The use of EMICD and GPR data in conjunction with historical information and physical observations are all utilized to mark the approximate location of potential former USTs in the field as shown on the GIS imagery maps.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

Similar response is observed near former septic systems. Most all septic tanks are reported to have been abandoned in place or partly crushed in place. Magnetic locator surveys revealed concentrated areas of metal response (metal anomalies) likely from metal plates and rebar in septic tanks in areas near former sewer clean-outs and next to reported septic tank locations where latitude and longitude data is available. EM Induction and GPR transects over these metal anomalies further corroborated these findings. EM Induction survey results near the effluent (down gradient) side of metal anomalies (potential septic tanks) resulted in observation of relatively moderately higher lateral response to zones of low to quiet lateral response zones near the septic tanks relative to the ambient response in surrounding area. GPR data across these zones exhibited very subtle side-wall trends that appear to corroborate with EMICD findings. The use of EMICD and GPR data in conjunction with historical information and physical observations of cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs in the field and as shown on the GIS imagery maps.

CONCLUSIONS and LIMITATIONS

The use of EMICD and GPR data in conjunction with historical information and physical observations of reported building location, vent riser location, boiler room location, existing and abandoned sewer cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs , Septic tanks and leach fields. Ambient soil conductivity at this site is very high and EM and GPR data observed is very subtle. Field trends are used to mark the approximate location of potential targets.

As in any type of survey or investigation to determine characteristics below grade, careful exploratory excavation or drilling may be needed to further help determine a more accurate determination of the subsurface. Use of hand tools and air knifing is also useful to help as a safety measure. Base one- call utilities, as well as, private 811 one –call should be consulted and recalled as necessary.

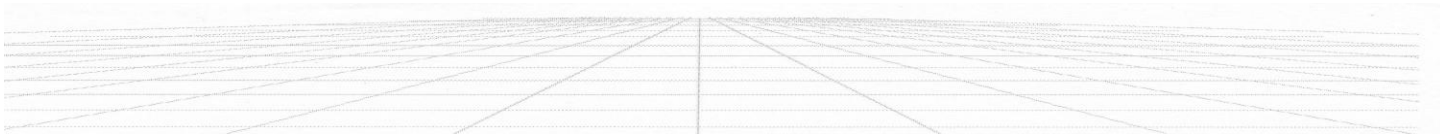
If you have any questions regarding this report please contact me at (206) 384- 2857.

Sincerely,

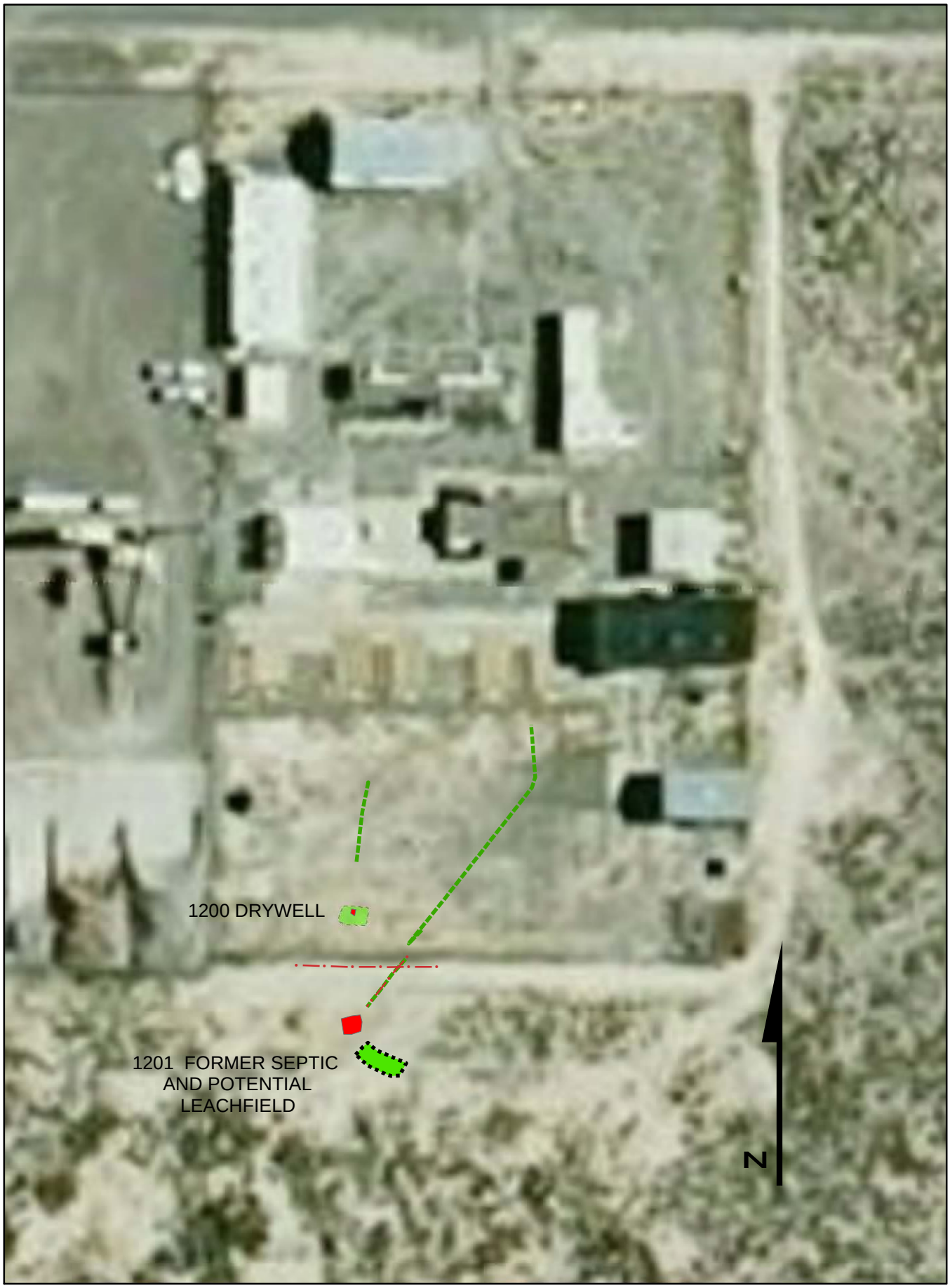
ULS SERVICES CORPORATION
Geomarkout tradename

Michael W. Benedict
Site Representative

Admin Office/Billing: PO Box 724 Pocatello, Idaho 83204
(208) 234-1441 Fax (208) 234-1507 1 800 301-4420
Seattle / Portland / SAC / Alaska / HWI – AS - GUAM Operations
1 - (866) 804- 5734 / San Diego – LA / Operations 1 - (800) 528-8206



BLDG 1200 AND 1201 SEPTIC SYSTEMS
HOLLOMAN AFB



WGS_1984_UTM_Zone_13N
ULS SERVICES CORP
mwb 16 June 2012

0 25 50 100 150 200
Feet

Appendix D
Sample Collection Logs

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

144106 - H008

Location Code OTC538

RFA / COC Number ~~06~~

062912

Sample Number OTC538-IS-0001-~~MMDDYY~~

Task

Sample Name OTC538-z-OTC538-IS-0001-MMDDYY-z

Collection Date 062912

Sampling Method ~~Unknown~~ DPT Invest.

Sample Type ~~Unknown~~ Grab

Collection Time 1220

Start Depth 3'

Sample Purpose ~~Unknown~~

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW8020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: _____

tch Location:

06/29/12

Logged By / Dat Rachel Dalby *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code OTC538

RFA / COC Number 144106-H008

Sample Number OTC538-IS-0002-~~MMDDYY~~ 062912

Task

Sample Name OTC538-z-OTC538-IS-0002-MMDDYY-z

Collection Date 062912

Sampling Method ~~Unknown~~ DPT Invest.

Sample Type ~~Unknown~~ Grab

Collection Time 1225

Sample Purpose ~~Unknown~~

Start Depth 10

End Depth 12

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Rachel Daly 6/29/12 *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code FIELDQC

RFA / COC Number 144106-H008

Sample Number OTC538-IS-0003-~~MMDDYY~~-FD 062912

Task

Sample Name FIELDQC-z-OTC538-IS-0003-MMDDYY-FD-z

Collection Date 062912

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1228

Sample Purpose ~~Unknown~~ QC

Start Depth 10

End Depth 12

QC Code FIELD DUPLICATE

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06/29/12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

STATION 2

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code OTC538

RFA / COC Number 144106 -H008

Sample Number OTC538-IS-0004-~~MMDDYY~~ 062912

Task

Sample Name OTC538-z-OTC538-IS-0004-MMDDYY-z

Collection Date 06 29 12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1240

Sample Purpose ~~Unknown~~ Invest.

Start Depth 7'

End Depth 9'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Rachel Daly 6/29/12

Reviewed By / Dat _____

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code OTC538

RFA / COC Number 144106-H008

Sample Number OTC538-IS-0005-~~MMDDYY~~ 062912

Task

Sample Name OTC538-z-OTC538-IS-0005-MMDDYY-z

Collection Date 062912

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1245

Sample Purpose Unknown Invest

Start Depth 14

End Depth 16

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam R.D, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06/29/12

Shaw *Logged By / Dat* Rachel Day *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code OTC538

RFA / COC Number 144106-H008

Sample Number OTC538-IS-0006-~~MMDDYY~~ 062912

Task

Sample Name OTC538-z-OTC538-IS-0006-MMDDYY-z

Collection Date 06 29 12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1255

Sample Purpose ~~Unknown~~ Invest

Start Depth 3'

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Rachel Daly 06/29/12 *Reviewed By / Dat* _____

Sample Collection Log

STATION 3

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code OTC538

RFA / COC Number 144106-H-008

Sample Number OTC538-IS-0007-~~MMDDYY~~ 062912

Task

Sample Name OTC538-z-OTC538-IS-0007-MMDDYY-z

Collection Date 062912

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1300

Sample Purpose ~~Unknown~~ Invest

Start Depth 10'

End Depth 12'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD, LH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

6/29/12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw Environmental Solutions

Manager Christopher Long

Location Code OTC538

RFA / COC Number 144106-H008

Task

Sample Number OTC538-IS-0008-~~MMDDYY~~ 062912

Sample Name OTC538-z-OTC538-IS-0008-MMDDYY-z

Collection Date 062912

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1315

Sample Purpose ~~Unknown~~ Invest.

Start Depth 3'

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sample Matrix SOIL

Sampling Equip Geoprobe

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	)(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06/29/12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code OTC538

RFA / COC Number 144106-H008

Task

Sample Number OTC538-IS-0009-~~MMDDYY~~ 062912

Sample Name OTC538-z-OTC538-IS-0009-MMDDYY-z

Collection Date 06.29.12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1325

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10

End Depth 12

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

Sample Team RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Rachel Daly 06/29/12 *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw Environmental Solutions

Manager Christopher Long

Location Code OTC538

RFA / COC Number 144106-H00B

Sample Number OTC538-IS-0010-~~MMDDYY~~ 062912

Task

Sample Name OTC538-z-OTC538-IS-0010-MMDDYY-z

Collection Date 06/29/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time ~~06~~ 1355

Sample Purpose ~~Unknown~~ Invest

Start Depth 0

End Depth 2

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06/29/12

Shaw EA&S *Logged By / Dat* Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw Environmental Solutions

Manager Christopher Long

Location Code OTC538

RFA / COC Number 144106-H008

Sample Number OTC538-IS-0011-~~MMDDYY~~ 062912

Task

Sample Name OTC538-z-OTC538-IS-0011-MMDDYY-z

Collection Date 06 29 12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1400

Sample Purpose ~~Unknown~~ Invest

Start Depth 25

End Depth 27

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RO, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06/29/12

Shaw EM

Logged By / Dat Rachel Daly

Reviewed By / Dat _____

Sample Collection Log

- Holloman AFB

Manager **Christopher Long**

Location Code **OTC538**

RFA / COC Number 144106 H067

Sample Number **OTC538-IS-0012-~~MMDDYY~~** 110612

Logging Co

Collection Date 11/6/12

Collection Time 14:45

Sampling Method ~~Unknown~~ GEOPROBE SONIC

Sample Type **Grab**

Sample Purpose ~~Unknown~~ CONFIRM

Start Depth 25'-0"

QC Code **NORMAL ENVIRONMENTAL SAMPL**

End Depth 27'-0"

Sampling Equip GEOPROBE / ALUM. TRAY

Sample Matrix **SOIL**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

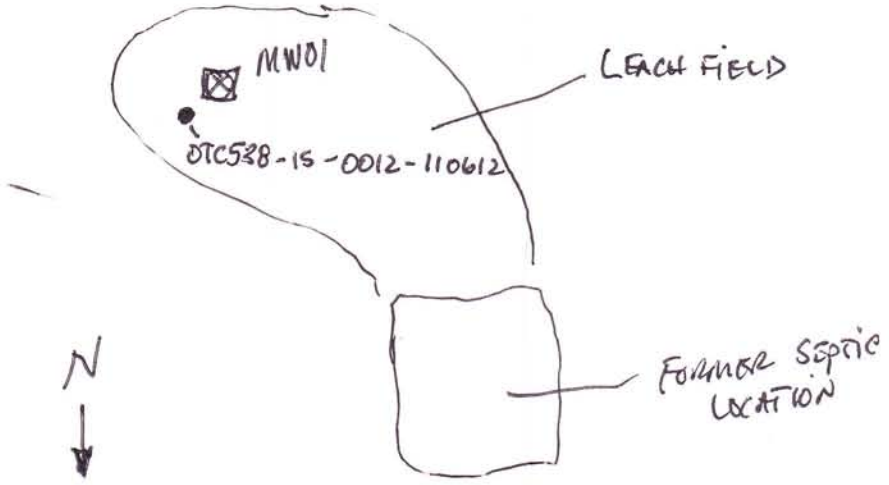
SampleTeam TH/TL

Containers:

Analytical Suite	Frtn	Filtered	Qty	Container Type	Perservative	Lab
Arsenic by SW6020A	A	Total	0	125 ml Glass (4oz)	Cool to 4°	:CUTEST LABS, ORLA
Arsenic by SW6010C	A	Total	1	125 ml Glass (4oz)	Cool to 4°	:CUTEST LABS, ORLA

Comments: ADDITIONAL SAMPLE FOR ARSENIC AS PER C. LONG.

Sketch Location:



Logged By / Date: 11/06/12

Reviewed By / Date: _____

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager **Christopher Long**

Location Code **OTC538** (Bldg 1201) *RFA / COC Number* 144106 - H014

Sample Number **OTC538-GW-5381-~~MMDDYY~~** 071212 *Task*

Sample Name **OTC538-z-OTC538-GW-5381-MMDDYY-z** *Collection Date* 07/12/12

Sampling Method ~~Unknown~~ Micropurge QED Pump *Sample Type* ~~Unknown~~ Grab *Collection Time* 1012

Sample Purpose ~~Unknown~~ Invest. *Start Depth* 31'

QC Code **NORMAL ENVIRONMENTAL SAMPL** *End Depth* 31'

Sampling Equip YSI 6820 / QED Bladder Pump *Sample Matrix* **GROUND WATER**

QC Partners:

(TB) OTC-TB2-071212 *(EB)* OTC-RB3-071212 *(FB)* _____ *SampleTeam* CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SW8015B : GRO	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	C	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
SW8015B : ORO	D	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015B : DRO	D	Unknown	2	1	L	1 Liter Amber Glass	H2SO4
PCBs by SW8082A	E	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Explosives by SW8330A	F	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Tritium by 906.0 Mod	G	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Mercury by SW7470A	H	Unknown	0	500	ML	500 ml Poly Container	HNO3
Metals by SW6020A	H	Unknown	0	500	ML	500 ml Poly Container	HNO3
Metals by SW6010C	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
Total CN water by 335.4	I	Unknown	1	500	ML	500 ml Poly Container	NaOH
TDS by 160.1	J	Unknown	1	500	ML	500 ml Poly Container	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chris Hill 07/12/12 *Reviewed By / Dat* _____

Sample Collection Log

Page: ~~19 of 49~~ 1/1

Shaw Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code ~~FIELDQC~~ IDW

RFA / COC Number HO 38

Sample Number ~~OTC644-GW-0441-MMDDYY-FD~~ LDY-IDWD1-090412

Sample Name ~~FIELDQC-2-OTC644-GW-0441-MMDDYY-FD-z~~

Task

Collection Date 09/04/2012

Sampling Method ~~Unknown~~ Composite

Sample Type ~~Unknown~~ Soil

Collection Time 1330

Sample Purpose ~~Unknown~~ IDW characterization

Start Depth NA

QC Code ~~FIELD DUPLICATE~~ NA

End Depth NA

Sampling Equip Stainless steel Trowel/Bowl/Aluminum

Sample Matrix ~~GROUND WATER~~ IDW Soil

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam LaThom, Hodu

Containers:

	Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
1)	VOCs by SW8260C TCLP VOCs	A	Unknown	~~3~~ 1	~~40~~ 8oz	~~ML~~	~~40 ml VOA Vials~~ Glass	~~HCL~~ Cool to 4°C
	~~SW8015B : GRO~~	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
2)	SVOCs by SW8270D TCLP SVOCs / other organics	EB	Unknown	~~2~~ 1	8	x oz	~~1 Liter Amber Glass~~ Glass	Cool to 4°
	~~SW8015B : GRO~~	B	Unknown	0	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~SW8015B : DRO~~	B	Unknown	2	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~PCBs by SW8082A~~ ~~TCLP~~	E	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
	~~Explosives by SW8330A~~	F	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
3)	~~Tritium by 906.0 Mod~~ RCI	C	Unknown	~~2~~ 1	~~1~~ 8oz		~~1 Liter Amber Glass~~ Glass	~~Cool to 4°C~~ Cool to 4°C
4)	Mercury by SW7470A TCLP Mercury	~~F~~ D	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~ oz	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
5)	Metals by SW6020A TCLP Metals	~~H~~ E	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
	~~Metals by SW6010C~~	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
	~~Total CN water by 335.4~~	I	Unknown	1	500	ML	~~500 ml Poly Container~~	NaOH
	~~TDS by 160.1~~	J	Unknown	1	500	ML	500 ml Poly Container	~~Cool to 4°~~

Comments: Composite Soil sample for TCLP analyses of IDW cuttings rolloff at Lay down Yard, 09/04/12

Sketch Location: Rolloff box Composite Sample @ Lay down Yard.

Analyses: TCLP VOCs, TCLP SVOCs, TCLP metals, TCLP Mercury, RCI

LDY = Lay down Yard

~~Shaw~~ *Logged By / Dat* Mel Hall *Reviewed By / Dat* _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code BULK WATER TANK

RFA / COC Number 144106 H070

Sample Number HAFB-IDW-BULK WATER-0001-111612

Task 144106.JM20000

Sample Name HAFB-IDW-BULK WATER-0001-111612

Collection Date 11/16/12

Sampling Method BAILER

Sample Type GRAB

Collection Time 13:00

Sample Purpose CONFIRM IDW

Start Depth N/A

QC Code

End Depth N/A

Sampling Equip DISPOSABLE BAILER

Sample Matrix **WATER**

QC Partners:

(TB) (EB) (FB)

SampleTeam JH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	B	Unknown	4	8	8OZ	Amber Glass	Cool to 4°
SW8015 : ORO	C	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015 : DRO	C	Unknown	1	1	L	1 Liter Amber Glass	H2SO4
Metals by SW6020A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
METALS by SW6020A	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Mercury by SW7470A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Metals by SW6010C	D	Unknown	1	500	ML	500 ml Poly Container	HNO3
	E		1	500	ML	500 ml Poly Cont	Cool to 4°
SW8015 : GRO	F	Unknown	3	40	ML	40 ml VOA Vials	HCL

Comments: SAMPLE COLLECTED FROM BULK WATER STORAGE TANK AFTER ALL WATER DRUMS WERE CONSOLIDATED. SENT BOTH A PRESERVED AND UNPRESERVED 500ML POLY FOR METALS. SPOKE WITH LAB AND THEY SAID TO SEND UNPRESERVED, BUT I THINK MAYBE THEY MADE A MISTAKE.

Sketch Location:

Shaw Logged By / Dat

Reviewed By / Dat

Appendix E
Boring Logs

Boring ID: OT-C538-Station 1

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1201

Date Completed: 6/29/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4110.07
Y Coordinate: 681010.2876
X Coordinate: 1690052.9610

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); light brown; dry; soft.	ML	Hand auger from 0 - 5 ft. Began drilling on 6/29/12.
5		OTC538-IS-0001-062912	NR		Same as above (0 ft); brown to reddish brown; soft to medium firm; very fine sand; clayey.		
10		OTC538-IS-0002-062912 and OTC538-IS-0003-062912-FD	NR		Same as above (0 ft); brown to reddish brown; soft to medium firm.		
15			NR				Total depth = 15 ft. Reached total depth on 6/29/12. **Water table not encountered in this boring.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:48 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C538-Station 2

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1201

Date Completed: 6/29/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4110.30
Y Coordinate: 680973.3473
X Coordinate: 1690014.4262

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT with Gravel (ML); brown; dry; soft to medium firm. Note: some concrete rubble (fill).		Hand auger from 0 - 5 ft. Began drilling on 6/29/12.
5			NR		SILT (ML); brown; dry; soft; trace fine to medium gravel.	ML	
		OTC538-IS-0004-062912					
10			NR		Same as above (5 ft).		
					Silty SAND (SM); reddish brown; dry; loose. Note: trace gypsum crystals.	SM	
15		OTC538-IS-0005-062912	NR		SILT (ML); mottled red and white; dry; soft; trace very fine sand; clayey. Note: trace gypsum present.	ML	
					Same as above (14 ft).		
20			NR				Total depth = 20 ft. Reached total depth on 6/29/12. **Water table not encountered in this boring.
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:49 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C538-Station 3

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1201

Date Completed: 6/29/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4109.64
Y Coordinate: 680956.8871
X Coordinate: 1690016.9095

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); brown to light brown; dry; soft; trace fine gravel.	ML	Hand auger from 0 - 5 ft. Began drilling on 6/29/12.
5		OTC538-IS-0006-062912	NR		Same as above (0 ft).		
10		OTC538-IS-0007-062912	NR		Silty SAND (SM); mottled red and white; dry; loose; very fine sand; clayey. Note: trace gypsum crystals. Same as above (8.5 ft)	SM	
15			NR		Lean CLAY (CL); mottled red and white; dry; soft to medium firm; silty. Note: gypsum crystals.	CL	Total depth = 15 ft. Reached total depth on 6/29/12. **Water table not encountered in this boring.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:49 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C538-Station 4 (OTC538-MW01)

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1201

Date Completed: 6/29/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Top of PVC Riser Pipe AMSL (ft): 4109.43
Y Coordinate: 680940.5579
X Coordinate: 1690045.5512

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0		OTC538-IS-0010-062912	NR		SILT (ML); brown to light brown; dry; soft; fine to medium gravel.	ML	Hand auger from 0 - 5 ft. Began drilling on 6/29/12.
5		OTC538-IS-0008-062912	NR		Same as above (0 ft).		
10		OTC538-IS-0009-062912	NR		Silty SAND (SM); reddish brown; dry; loose; very fine sand. Note: trace gypsum. Same as above (7 ft).	SM	
15			NR		Lean CLAY (CL); mottled red and white; dry; soft to medium firm; significant silt content. Note: gypsum crystals. Same as above (12 ft).	CL	
20			NR		SILT (ML); whtie; dry; medium stiff.	ML	
25		OTC538-IS-0011-062912	NR		Same as above (12 ft). Silty SAND (SM); light brown to white; dry; loose. Note: trace gypsum. Same as above (20 ft); red; dry; medium dense. Same as above (20 ft); mottled red to golden brown. ▽	CL SM	
30					Poorly graded SAND with Silt (SP-SM); brown; saturated; loose; very fine sand. Lean CLAY (CL); brown; dry; stiff. Note: gypsum present.	SP-SM CL ML	

Boring ID: OT-C538-Station 4 (OTC538-MW01)

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1201

Date Completed: 6/29/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Top of PVC Riser Pipe AMSL (ft): 4109.43
Y Coordinate: 680940.5579
X Coordinate: 1690045.5512

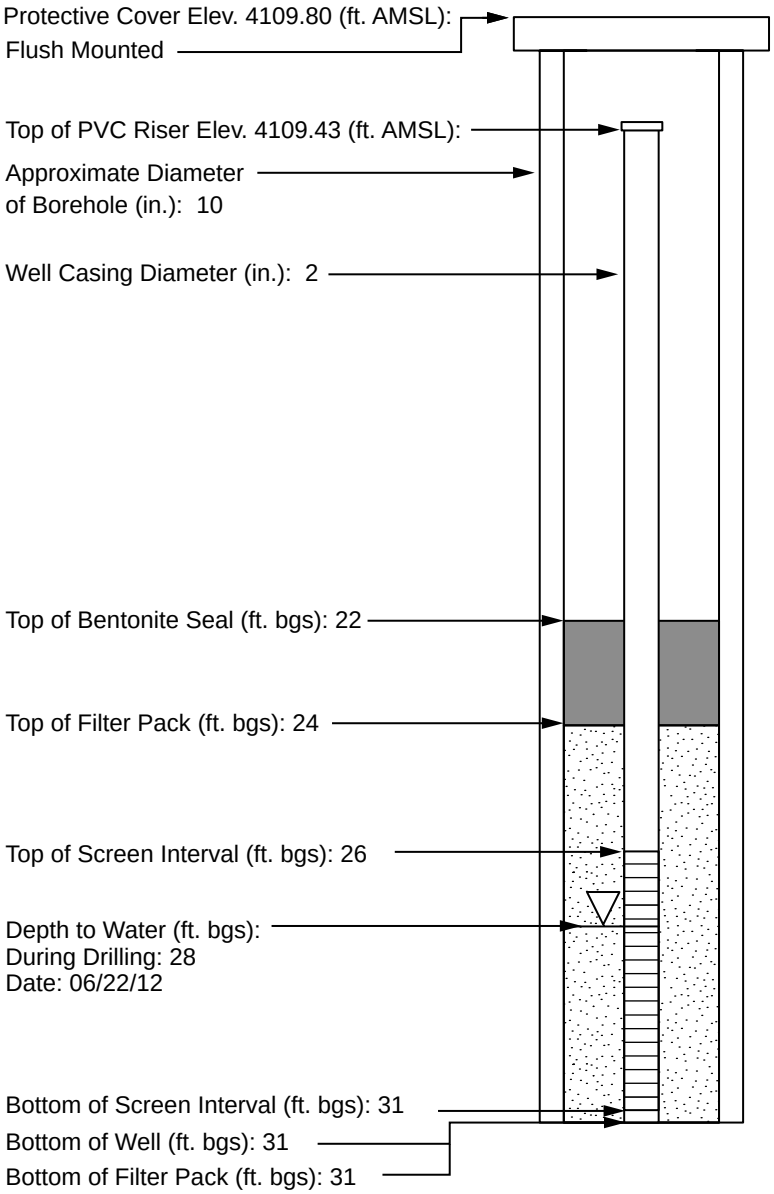
Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
30			NR		SILT (ML); brown; dry; firm to hard.		Total depth = 30 ft. Reached total depth on 6/29/12.
35							
40							
45							
50							
55							
60							

Appendix F
Well Construction Diagrams

Well Construction Diagram

Project: Holloman AFB
Location: OT-C538
Client: USAF
Subcontractor: Major Drilling
Driller: K. Burkhead
Drilling Method/Rig Type: DPT/Auger
Shaw Field Representative: B. Squire

Well Number: OTC538-MW01
Site Location: Building 1201
Installation Date: 07/02/2012
Completion Date: 07/02/2012
Grid Northing: 680940.5579
Grid Easting: 1690045.5512
NAD: 83 SPCS NM Central
NAVD: 88



Not To Scale

Protective Casing: Circular
Type: Flush Mount
Dimensions (in.): 8
Length (in): 10
Guard Post: NA

Ground Seal (Surface pad):
Dimensions (ft.): 2 x 2
Type: Concrete

Annular Space Seal:
Type: Quikcrete and Quikgel Bentonite
Installation: Gravity

Bentonite Seal:
Manufacturer: Enviro Plug
# of Bags: 2 (50 lbs each)
Type: 3/8" Pellets
Installation: Gravity
Hydration time (hrs): 1

Filter Pack Material:
Manufacturer: DSI
Product Name: Well Gravel Pack
Size: GP#3
# of Bags: 3 (50 lbs each)
Installation: Gravity

Well Casing Used (ft.):
Manufacturer: Silverline
Type: PVC Schedule 40
Diameter (in.): 2

Well Screen Casing:
Manufacturer: DSI
Type: 2" Pre-pack w/ vf SS Mesh w/ 1A Sand
Slot Size (in.): 0.010
Slot Type: Factory

Sump/End Cap (in.): 4 (PVC)
Backfill Material: NA

Appendix G
Well Purge Records

Shaw® Shaw E & I

EXAMPLE
WELL PURGE RECORD

Project Name: Holloman AFB - Midwest

Location: OT-C538 (Bldg 1201) Well/Piez. No.: OT-C538-1

Personnel: CL, CH, MH Date Installed: 7/2/12

Date (Start/End): 7/12/12 Csg. Diameter (I.D.): 2"

~~Method of Development~~: Sampling Total Depth (ft. TOC): 33.31

☐ Surging ☐ Bailing ☐ X Pumping ☐ Other (State Method) Sample

☐ Original Development ☐ Redevelopment ~~Development~~ Date: 7/12/12

Depth to water before developing well: 29.70 ft btoc

		Volume (V)	Purge Factor	Volume To Purge
Height of Water Column:	_____ feet	_____ =	_____ gal.*	_____ = _____

$V = (B * r_c^2 * L_c * 7.48) + (B*(r_w - r_c)^2 * L_s * \phi_s * 7.48) =$ _____ gallons (See Notes below)

Depth purging from: 31 feet Time purging begins: 0942, 7/12/12

Weather: Sunny, 80's Screened Interval (ft. BGL): 26-31

Equipment Nos.: ~~pH Meter~~ YSI 6820 ~~EC Meter~~ N/A ~~Turbidity Meter~~ N/A

Equipment decontaminated prior to development Y X N _____

Describe _____

200mL/min

Date	Time	Water Level (ft. below TOC)	Volume Removed ~~(gal.)~~ L	Temp (C or F)	pH	~~Conc.~~ ~~EC~~ mS/cm	Turbidity	D.O.	~~Comments~~ ORP	TDS (g/L)
7/12/12	0946	30.03	.2	21.25	6.98	16.23	16.7	2.93	217.1	10.54
"	0951	30.14	1.2	20.26	7.10	16.19	6.9	5.20	216.5	10.53
"	0956	30.15	2.2	19.88	7.14	16.19	7.4	4.59	283.0	10.51
"	1001	30.20	3.2	19.83	7.16	16.18	5.4	5.50	292.6	10.53
"	1006	30.26	4.2	19.70	7.17	16.19	2.8	5.57	300.1	10.53
"	1011	30.32	5.2	19.68	7.18	16.21	1.0	5.59	305.4	10.52
"	1012	Sample*	TDS	only	*					

Notes:

- Water levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to 0.1 pH units
- Electrical conductivity (EC) – Reported to the nearest 10% mhos/cm or µmho/cm @25 C or in mS/cm of instrument set range
- Water temperature – Reported to the nearest 0.1 C or F feet
- Dissolved oxygen (D.O.) report in 0.1 mg/L
- Turbidity report in NTV nearest whole #

Where:
B=3.14
ϕ_s=porosity of the sand pack
r_c =radius of the well casing and screen in feet
L_c=length of water column inside the casing and screen in
r_w =radius of the well bore in feet
L_s =length of saturated portion of the sand pack in feet
7.48 gallons/cubic foot=conversion from cubic feet to gallons

Shaw® Shaw E & I

EXAMPLE
WELL PURGE RECORD

Project Name: Holloman / Midwest

Location: OTC538 (Bldg 9201)

Well/Piez. No.: OTC538-MW01

Personnel: CL, TK

Date Installed: 7/2/12

Date (Start/End): 5/16/13

Csg. Diameter (I.D.): 2"

Method of ~~Development~~: sampling

Total Depth (ft. TOC): ~~DEPTH~~ 31.65

☐ Surging ☐ Bailing ☒ Pumping ☐ Other (State Method) _____

☐ Original Development ☐ Redevelopment Sample Development Date: 5/16/13

Depth to water before developing well: 28.48 ft btoc (pre tubing); 28.41

	Volume (V)		Purge Factor		Volume To Purge
Height of Water Column: _____ feet	_____	=	_____ gal.*	_____	= _____

$V = (B * r_c^2 * L_c * 7.48) + (B*(r_w - r_c)^2 * L_s * \varnothing_s * 7.48) =$ _____ gallons (See Notes below)

Depth purging from: 30.5 feet

Time purging begins: 1156, 5/16/13

Weather: Sunny, 90's

Screened Interval (ft. BGL): 26 - 31

Equipment Nos.: pH Meter YSI 850MDS EC Meter _____ Turbidity Meter _____

Equipment decontaminated prior to development Y X N _____

Describe DI H2O, Alconox

Date 5/16/13	Time	Water Level (ft. below TOC)	Volume Removed ~~(gal.)~~ L	Temp (C or F)	pH	EC	Turbidity	D.O.	~~Comments~~ ORP
"	1156	28.81	0	24.84	7.75	15.74	137.0	10.43	-44.0
"	1201	29.25	2.5	21.51	7.69	15.63	26.7	10.77	-34.4
"	1206	NR*	5	22.54	7.64	15.62	11.9	9.63	-26.8
		No Sample Collect. Well purged dry and							
		did not recharge after an hour.							

Notes:

- Water levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to 0.1 pH units
- Electrical conductivity (EC) – Reported to the nearest 10% mhos/cm or
- µmho/cm @25 C or in mS/cm of instrument set range
- Water temperature – Reported to the nearest 0.1 C or F feet
- Dissolved oxygen (D.O.) report in 0.1 mg/L
- Turbidity report in NTV nearest whole #

Where:

B=3.14

$\varnothing_s$=porosity of the sand pack

r_c =radius of the well casing and screen in feet

L_c=length of water column inside the casing and screen in feet

r_w =radius of the well bore in feet

L_s =length of saturated portion of the sand pack in feet

7.48 gallons/cubic foot=conversion from cubic feet to gallons

*well purged dry, waiting for well to recharge; once well has recharged samples will be collected for VOCs, TPH, and SVOCs if possible.

Appendix H
Site Survey Data

Revised Rpt
09/11/2013
(re: TU/US-C513)
p. 7 of 10

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	682987.8550	1687022.9920	4098.16	BASE	682789.9107	1686534.0572
2	678390.1010	1678735.5020	4064.77	CP-52-P-19	678193.4892	1678248.9690
3	683252.1480	1680789.5360	4078.80	CP-55-JACK	683054.1271	1680302.4077
4	681667.1260	1694574.3780	4140.57	CP-56-AIR	681469.5645	1694083.2546
5	669733.4460	1682234.2110	4048.59	HAFB-07-07	669539.3431	1681746.6640
6	669695.2030	1718768.4150	4157.95	ALAMOAIR	669501.1112	1718270.2797
7	674362.7100	1713591.4300	4160.17	F248	674167.2655	1713094.7951
8	676850.6600	1718114.2590	4193.99	E-248	676654.4944	1717616.3133
50	691964.7620	1687201.2770	4140.90	MALONE	691764.2160	1686712.2905
51	662077.1700	1670356.4250	4077.10	BATE	661885.2861	1669872.3205
52	678390.1080	1678735.5040	4066.10	P 19	678193.4962	1678248.9710
53	644127.0780	1700529.8000	4039.00	MONT	643940.3964	1700036.9506
54	676850.6920	1718114.2670	4193.99	E 248	676654.5264	1717616.3213
55	683252.1970	1680789.5390	4080.20	JACK	683054.1761	1680302.4107
56	681667.0380	1694574.3640	4141.20	AIR	681469.4765	1694083.2406
82	678193.4999	1678248.9801	4064.92	P	677996.9451	1677762.5882
84	676654.5300	1717616.3305	4192.77	E	676458.4212	1717118.5291
85	683054.1798	1680302.4198	4079.02	JACK	682856.2163	1679815.4327
86	681469.4802	1694083.2497	4140.00	AIR	681271.9760	1693592.2686
100	685975.0760	1686614.9100	4101.87	OT-C534-PVC	685776.2660	1686126.0934
101	685975.4260	1686614.8310	4102.28	OT-C534-CASING	685776.6159	1686126.0145
102	685952.4860	1686626.9650	4101.89	OT-C534-W2-PVC	685753.6825	1686138.1449
103	685952.6870	1686626.9300	4102.33	OT-C534-W2-CASING	685753.8834	1686138.1099
104	685939.9110	1686581.7340	4101.89	OT-C534-W1-CASING	685741.1111	1686092.9270
105	685939.6450	1686581.7790	4101.57	OT-C534-W1-PVC	685740.8452	1686092.9720
106	685924.3640	1686619.9800	4101.81	OT-C534-W4-PVC	685725.5687	1686131.1620
107	685924.6590	1686619.8790	4102.23	OT-C534-W4-CASING	685725.8636	1686131.0610
108	685934.1180	1686578.3320	4101.72	OT-C534-LEACH-NG	685735.3198	1686089.5260
109	685935.7830	1686600.7340	4101.88	OT-C534-LEACH-NG	685736.9843	1686111.9215
110	685938.2680	1686607.0980	4101.88	OT-C534-LEACH-NG	685739.4686	1686118.2837
111	685951.4240	1686604.4600	4101.90	OT-C534-LEACH-NG	685752.6208	1686115.6465
112	685953.8200	1686601.1380	4101.88	OT-C534-LEACH-NG	685755.0161	1686112.3254
113	685953.2500	1686596.8650	4101.88	OT-C534-LEACH-NG	685754.4463	1686108.0537
114	685946.2830	1686578.3790	4101.81	OT-C534-LEACH-NG	685747.4813	1686089.5730
115	685945.3070	1686576.3400	4101.88	OT-C534-LEACH-NG	685746.5056	1686087.5346
116	685940.6850	1686575.6580	4101.79	OT-C534-LEACH-NG	685741.8849	1686086.8528
117	685952.3510	1686614.8200	4102.03	OT-C534-LEACH-NG	685753.5475	1686126.0035
118	685953.0040	1686623.0300	4102.13	OT-C534-LEACH-NG	685754.2004	1686134.2111
119	685945.6920	1686623.1960	4102.03	OT-C534-LEACH-NG	685746.8905	1686134.3770
120	685944.8810	1686615.5440	4101.97	OT-C534-LEACH-NG	685746.0797	1686126.7272
121	685948.0570	1686615.1700	4101.97	OT-C534-FLINE-NG	685749.2548	1686126.3534
122	685947.7680	1686606.3420	4101.81	OT-C534-FLINE-NG	685748.9659	1686117.5279
123	685953.2050	1686618.0690	4102.08	OT-C534-ENFLU-NG	685754.4013	1686129.2515
124	685968.5800	1686611.5870	4102.06	OT-C534-ENFLU-NG	685769.7718	1686122.7714
125	686021.5760	1686604.3860	4102.49	OT-C534-ENFLU-NG	685822.7525	1686115.5725
126	686051.0660	1686600.5520	4102.82	OT-C534-ENFLU-NG	685852.2339	1686111.7396
127	682943.9250	1686529.5770	4094.74	OT-C536-STATION1-NG	682745.9934	1686040.7852
128	682925.1900	1686534.9010	4094.63	OT-C536-STATION2-NG	682727.2639	1686046.1076
129	682914.0740	1686530.8350	4094.17	OT-C536-STATION3-NG	682716.1511	1686042.0428
130	682900.2750	1686534.1950	4094.40	MW-OT-C5361-CASING	682702.3561	1686045.4018
131	682900.0410	1686534.2560	4094.03	MW-OT-C5361-PVC	682702.1222	1686045.4628
132	682892.0960	1686514.3610	4094.08	OT-C536-LEACH-NG	682694.1795	1686025.5736
133	682905.9860	1686504.4840	4093.98	OT-C536-LEACH-NG	682708.0654	1686015.6994
134	682914.9460	1686505.2970	4094.10	OT-C536-LEACH-NG	682717.0228	1686016.5122
135	682919.4610	1686521.1490	4094.40	OT-C536-LEACH-NG	682721.5365	1686032.3596
136	682921.1340	1686534.7310	4094.42	OT-C536-LEACH-NG	682723.2091	1686045.9377
137	682919.5910	1686545.0230	4094.72	OT-C536-LEACH-NG	682721.6665	1686056.2267
138	682912.1700	1686551.2270	4094.60	OT-C536-LEACH-NG	682714.2477	1686062.4289
139	682897.7180	1686551.9240	4094.16	OT-C536-LEACH-NG	682699.7998	1686063.1257
140	682892.5110	1686549.8820	4094.18	OT-C536-LEACH-NG	682694.5943	1686061.0843
141	682922.3680	1686533.4440	4094.42	OT-C536-TANKPIT-NG	682724.4427	1686044.6510
142	682920.9800	1686525.5880	4094.39	OT-C536-TANKPIT-NG	682723.0551	1686036.7973
143	682928.0220	1686524.4280	4094.63	OT-C536-TANKPIT-NG	682730.0951	1686035.6377
144	682929.2370	1686532.7090	4094.62	OT-C536-TANKPIT-NG	682731.3097	1686043.9163
145	682949.7020	1686528.9800	4094.75	OT-C536-ENFLU-NG	682751.7688	1686040.1883
146	682921.2900	1686528.9090	4094.41	OT-C536-ENFLU-NG	682723.3650	1686040.1174
147	682916.2970	1686530.1310	4094.27	OT-C536-ENFLU-NG	682718.3735	1686041.3390
148	682877.6850	1686739.3620	4095.03	OT-C533-MW-CASING	682679.7726	1686250.5094
149	682877.4490	1686739.4350	4094.68	OT-C533-MW-PVC	682679.5367	1686250.5823
150	682884.2550	1686735.8390	4094.76	OT-C533-LEACH-NG	682686.3407	1686246.9874
151	682877.4700	1686734.1690	4094.84	OT-C533-LEACH-NG	682679.5577	1686245.3179

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
152	682871.6400	1686736.6530	4094.83	OT-C533-LEACH-NG	682673.7294	1686247.8011
153	682869.4200	1686738.9370	4094.89	OT-C533-LEACH-NG	682671.5100	1686250.0845
154	682868.8760	1686741.4810	4094.99	OT-C533-LEACH-NG	682670.9662	1686252.6277
155	682867.8710	1686756.1100	4095.03	OT-C533-LEACH-NG	682669.9615	1686267.2525
156	682857.6950	1686766.0680	4095.35	OT-C533-LEACH-NG	682659.7884	1686277.2076
157	682855.8760	1686772.9280	4095.39	OT-C533-LEACH-NG	682657.9700	1686284.0656
158	682855.6590	1686783.4130	4095.46	OT-C533-LEACH-NG	682657.7530	1686294.5476
159	682855.5230	1686790.0690	4095.47	OT-C533-LEACH-NG	682657.6171	1686301.2017
160	682857.2270	1686794.8730	4095.42	OT-C533-LEACH-NG	682659.3206	1686306.0043
161	682858.6900	1686813.7880	4095.55	OT-C533-LEACH-NG	682660.7832	1686324.9138
162	682867.9360	1686816.7350	4095.32	OT-C533-LEACH-NG	682670.0265	1686327.8599
163	682880.0660	1686814.6740	4095.00	OT-C533-LEACH-NG	682682.1530	1686325.7995
164	682891.9700	1686818.7840	4094.82	OT-C533-LEACH-NG	682694.0535	1686329.9083
165	682901.1340	1686806.7570	4094.86	OT-C533-LEACH-NG	682703.2148	1686317.8848
166	682889.7110	1686785.0140	4094.98	OT-C533-LEACH-NG	682691.7952	1686296.1481
167	682889.3190	1686757.8750	4094.96	OT-C533-LEACH-NG	682691.4033	1686269.0170
168	682886.6550	1686745.7080	4094.83	OT-C533-LEACH-NG	682688.7400	1686256.8535
169	682895.8900	1686814.7130	4095.19	OT-C533-FFLUEN-NG	682697.9724	1686325.8385
170	682901.8890	1686814.2530	4095.86	OT-C533-FFLUEN-TPAD	682703.9696	1686325.3787
171	682901.5970	1686811.8220	4095.84	OT-C533-SEPTIC-TCONC	682703.6777	1686322.9484
172	682911.5820	1686810.3750	4095.77	OT-C533-SEPTIC-TCONC	682713.6598	1686321.5018
173	682912.4280	1686815.4170	4095.77	OT-C533-SEPTIC-TCONC	682714.5056	1686326.5423
174	682902.3730	1686816.8390	4095.84	OT-C533-SEPTIC-TCONC	682704.4535	1686327.9639
175	682912.0910	1686812.7560	4095.77	OT-C533-EFLUEN-TCONC	682714.1687	1686323.8821
176	682923.3600	1686810.9450	4095.29	OT-C533-EFLUEN-NG	682725.4344	1686322.0716
177	682942.2940	1686810.3140	4095.49	OT-C533-EFLUEN-NG	682744.3629	1686321.4408
178	682937.5080	1686805.9000	4095.30	OT-C533-STATION1-NG	682739.5783	1686318.0278
179	682906.2780	1686808.8380	4094.86	OT-C533-STATION2-NG	682708.3574	1686319.9652
180	682895.2770	1686813.2080	4094.98	OT-C533-STATION3-NG	682697.3595	1686324.3340
181	700191.9570	1695605.3730	4181.72	OT-C540-STATION1-ASP	699989.0266	1695113.9508
182	700173.9260	1695611.2520	4181.82	OT-C540-STATION2-NG	699971.0008	1695119.8281
183	700168.8930	1695604.5390	4181.39	OT-C540-STATION3-NG	699965.9693	1695113.1170
184	700151.2700	1695598.6630	4180.49	OT-C540-STATION4-NG	699948.3514	1695107.2427
185	700158.9630	1695593.9090	4180.86	OT-C540-LEACH-NG	699956.0422	1695102.4901
186	700150.2560	1695603.0840	4180.78	OT-C540-LEACH-NG	699947.3377	1695111.6625
187	700152.8330	1695609.6400	4180.81	OT-C540-LEACH-NG	699949.9139	1695118.2166
188	700155.1660	1695611.7200	4180.89	OT-C540-LEACH-NG	699952.2463	1695120.2960
189	700161.1020	1695611.3470	4181.11	OT-C540-LEACH-NG	699958.1805	1695119.9231
190	700163.7200	1695601.1600	4181.06	OT-C540-LEACH-NG	699960.7978	1695109.7390
191	700161.5790	1695596.1920	4181.05	OT-C540-LEACH-NG	699958.6574	1695104.7725
192	700165.7400	1695603.7570	4181.48	OT-C540-FFLUEN-NG	699962.8172	1695112.3353
193	700170.8520	1695608.8530	4181.93	OT-C540-FFLUEN-NG	699967.9277	1695117.4298
194	700170.7290	1695606.7600	4182.01	OT-C540-SEPTIC-NG	699967.8048	1695115.3374
195	700176.8760	1695605.4490	4181.91	OT-C540-SEPTIC-NG	699973.9500	1695114.0268
196	700177.5910	1695612.4300	4181.92	OT-C540-SEPTIC-NG	699974.6648	1695121.0058
197	700172.1930	1695613.9030	4182.05	OT-C540-SEPTIC-NG	699969.2683	1695122.4783
198	700177.7030	1695608.9790	4181.69	OT-C540-EFLUEN-NG	699974.7767	1695117.5558
199	700205.8220	1695608.1850	4181.85	OT-C540-EFLUEN-ASPH	700002.8876	1695116.7620
200	700246.4300	1695613.4690	4182.95	OT-C540-EFLUEN-ASPH	700043.4838	1695122.0445
201	700238.4930	1695614.0360	4182.51	OT-C540-BLDGCOR	700035.5491	1695122.6113
202	700228.4390	1695608.1640	4182.55	OT-C540-BLDGCOR	700025.4980	1695116.7410
203	700227.0510	1695568.0300	4182.87	OT-C540-BLDGCOR	700024.1104	1695076.6186
204	700236.9380	1695557.6950	4183.02	OT-C540-BLDGCOR	700033.9946	1695066.2866
205	688305.7410	1690609.5510	4126.46	TU\US-C507-STATION1-	688106.2555	1690119.5767
206	688309.7220	1690614.0760	4126.51	TU\US-C507-STATION2-	688110.2353	1690124.1004
207	688306.7130	1690619.4150	4126.45	TU\US-C507-STATION3-	688107.2272	1690129.4378
208	688313.7000	1690621.8280	4126.37	TU\US-C507-STATION4-	688114.2122	1690131.8501
209	688313.7950	1690607.6410	4126.36	TU\US-C507-STATION5-	688114.3071	1690117.6673
210	688304.0140	1690620.9730	4126.47	TU\US-C507-USTPIT-AS	688104.5290	1690130.9954
211	688304.3040	1690607.3010	4126.54	TU\US-C507-USTPIT-AS	688104.8189	1690117.3274
212	688317.4320	1690607.1780	4126.54	TU\US-C507-USTPIT-AS	688117.9431	1690117.2044
213	688317.6000	1690622.2860	4126.57	TU\US-C507-USTPIT-AS	688118.1110	1690132.3080
214	688320.7590	1690623.9670	4127.18	TU\US-C507-BLDGCOR	688121.2691	1690133.9885
215	688330.7630	1690627.7570	4125.65	TU\US-C507-BLDGCOR	688131.2702	1690137.7774
216	688318.5520	1690598.7120	4126.71	TU\US-C507-BLDGCOR	688119.0628	1690108.7408
217	688306.5580	1690598.9520	4126.69	TU\US-C507-BLDGCOR	688107.0722	1690108.9808
218	688287.5740	1690592.3200	4126.83	TU\US-C507-EXMW1	688088.0937	1690102.3507
219	688287.4600	1690625.9270	4126.36	TU\US-C507-EXMW2	688087.9798	1690135.9480
220	689216.8690	1680453.8850	4087.76	TU\US-C501-STATION4-	689017.1194	1679966.8540
221	689203.4000	1680450.4300	4087.80	TU\US-C501-STATION1-	689003.6543	1679963.4000
222	689227.9170	1680449.2880	4087.78	TU\US-C501-STATION2-	689028.1642	1679962.2584

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
223	689201.2820	1680437.6020	4087.96	TU\US-C501-STATION3-	689001.5369	1679950.5757
224	689204.0090	1680426.7550	4087.80	TU\US-C501-STATION5-	689004.2631	1679939.7319
225	689200.5240	1680440.6650	4087.95	TU\US-C501-BLDGCOR-N	689000.7792	1679953.6379
226	689191.1430	1680432.8740	4088.07	TU\US-C501-BLDGCOR-N	688991.4009	1679945.8491
227	689202.0960	1680449.8730	4087.79	TU\US-C501-TANKPIT-N	689002.3507	1679962.8432
228	689201.5860	1680440.8210	4087.99	TU\US-C501-TANKPIT-N	689001.8408	1679953.7938
229	689191.7450	1680432.9310	4088.07	TU\US-C501-TANKPIT-N	688992.0027	1679945.9061
230	689195.4710	1680423.1750	4087.88	TU\US-C501-TANKPIT-N	688995.7276	1679936.1529
231	689207.1960	1680422.4490	4087.92	TU\US-C501-TANKPIT-N	689007.4492	1679935.4271
232	689229.2900	1680431.3210	4087.77	TU\US-C501-TANKPIT-N	689029.5368	1679944.2966
233	689231.6150	1680444.1310	4087.67	TU\US-C501-TANKPIT-N	689031.8611	1679957.1029
234	689227.5450	1680454.7320	4087.83	TU\US-C501-TANKPIT-N	689027.7923	1679967.7008
235	689218.0540	1680463.3780	4088.03	TU\US-C501-TANKPIT-N	689018.3041	1679976.3443
236	689209.0460	1680458.6260	4087.92	TU\US-C501-TANKPIT-N	689009.2987	1679971.5937
237	689237.1630	1680445.1670	4087.64	TU\US-C501-COMMLINE-	689037.4075	1679958.1386
238	689219.6050	1680436.9770	4088.00	TU\US-C501-COMMLINE-	689019.8546	1679949.9509
239	689199.7540	1680431.6770	4088.06	TU\US-C501-COMMLINE-	689000.0094	1679944.6525
240	689181.3550	1680425.0490	4088.20	TU\US-C501-COMMLINE-	688981.6157	1679938.0264
241	689162.6180	1680417.3900	4088.35	TU\US-C501-COMMLINE-	688962.8841	1679930.3696
242	689161.5970	1680417.5650	4088.56	TU\US-C501-COMMVAULT	688961.8634	1679930.5446
243	689157.8580	1680421.3400	4088.11	TU\US-C501-COMMVAULT	688958.1255	1679934.3185
244	689150.8680	1680414.5760	4088.10	TU\US-C501-COMMVAULT	688951.1375	1679927.5564
245	689154.6050	1680410.8830	4088.46	TU\US-C501-COMMVAULT	688954.8735	1679923.8645
246	687246.6430	1686873.0010	4105.82	OT-C535-STATION1-NG	687047.4644	1686384.1096
247	687270.5400	1686861.6690	4105.63	OT-C535-STATION2-NG	687071.3545	1686372.7809
248	687282.8340	1686866.7860	4105.85	OT-C535-STATION3-NG	687083.6449	1686377.8964
249	687303.5940	1686788.5490	4105.12	OT-C535-STATION4-NG	687104.3989	1686299.6821
250	687291.9640	1686793.7970	4105.27	OT-C535-LEACH-NG	687092.7723	1686304.9286
251	687304.7930	1686782.8770	4105.17	OT-C535-LEACH-NG	687105.5976	1686294.0117
252	687323.6740	1686798.1880	4105.34	OT-C535-LEACH-NG	687124.4731	1686309.3183
253	687319.7080	1686817.5380	4105.82	OT-C535-LEACH-NG	687120.5083	1686328.6627
254	687307.4400	1686838.9610	4105.76	OT-C535-LEACH-NG	687108.2438	1686350.0795
255	687297.0830	1686856.5380	4106.04	OT-C535-LEACH-NG	687097.8898	1686367.6514
256	687290.0540	1686837.9200	4105.59	OT-C535-LEACH-NG	687090.8628	1686349.0388
257	687291.3760	1686806.0200	4105.33	OT-C535-LEACH-NG	687092.1845	1686317.1480
258	687284.5890	1686864.5150	4106.11	OT-C535-FFLUEN-NG	687085.3994	1686375.6261
259	687276.8290	1686868.4490	4106.19	OT-C535-FFLUEN-NG	687077.6417	1686379.5589
260	687276.0820	1686870.8490	4106.28	OT-C535-SEPTIC-NG	687076.8949	1686381.9583
261	687263.3720	1686869.7190	4105.87	OT-C535-SEPTIC-NG	687064.1886	1686380.8286
262	687263.7200	1686863.5770	4105.95	OT-C535-SEPTIC-NG	687064.5365	1686374.6884
263	687276.4840	1686862.8870	4106.07	OT-C535-SEPTIC-NG	687077.2968	1686373.9986
264	687263.5270	1686868.1150	4105.92	OT-C535-EFLUEN-NG	687064.3435	1686379.2250
265	687228.9570	1686874.1570	4105.71	OT-C535-EFLUEN-NG	687029.7836	1686385.2653
266	687235.2230	1686881.4610	4106.05	OT-C535-BLDGCOR-NG	687036.0477	1686392.5672
267	687225.9150	1686892.3360	4105.90	OT-C535-BLDGCOR-NG	687026.7424	1686403.4390
268	687232.0250	1686844.5370	4105.92	OT-C535-BLDGCOR-NG	687032.8507	1686355.6539
269	687221.4890	1686835.3400	4105.63	OT-C535-BLDGCOR-NG	687022.3177	1686346.4595
270	677637.2460	1692755.6660	4110.24	TU/US-C505-MW1-CASIN	677440.8524	1692265.0697
271	677636.9990	1692755.6590	4109.84	TU/US-C505-MW1-PVC	677440.6055	1692265.0627
272	677634.4160	1692722.3930	4110.42	TU/US-C505-WELLATEMP	677438.0233	1692231.8064
273	677659.4620	1692742.2400	4110.34	TU/US-C505-WELLATEMP	677463.0620	1692251.6476
274	677701.9500	1692799.3200	4110.17	TU/US-C505-USTPIT-NG	677505.5377	1692308.7111
275	677701.3830	1692789.3010	4110.35	TU/US-C505-USTPIT-NG	677504.9708	1692298.6950
276	677711.5570	1692789.5280	4110.64	TU/US-C505-USTPIT-NG	677515.1419	1692298.9219
277	677710.8940	1692799.1130	4110.24	TU/US-C505-USTPIT-NG	677514.4791	1692308.5041
278	677707.4060	1692790.0820	4110.35	TU/US-C505-STATION1-	677510.9921	1692299.4757
279	677702.3100	1692795.0710	4110.20	TU/US-C505-STATION2-	677505.8976	1692304.4633
280	677705.6610	1692797.9500	4110.13	TU/US-C505-STATION3-	677509.2476	1692307.3415
281	677710.4770	1692793.8740	4110.09	TU/US-C505-STATION4-	677514.0622	1692303.2666
282	677706.4200	1692793.8350	4110.12	TU/US-C505-STATION5-	677510.0064	1692303.2276
283	677694.5060	1692779.7220	4110.88	TU/US-C505-BLDGCOR-N	677498.0958	1692289.1187
284	677704.1940	1692790.4680	4110.28	TU/US-C505-BLDGCOR-N	677507.7810	1692299.8616
285	677754.5670	1692783.0890	4110.79	TU/US-C505-BLDGCOR-N	677558.1394	1692292.4848
286	677743.8570	1692795.1680	4110.70	TU/US-C505-BLDGCOR-N	677547.4325	1692304.5603
287	686300.2320	1672933.0350	4060.98	OT-C542-MW-CASING-	686101.3277	1672448.1837
288	686300.2350	1672933.0550	4060.98	OT-C542-MW-PVC	686101.3307	1672448.2037
289	686274.4020	1672914.6520	4061.01	OT-C542-LEACH-NG	686075.5052	1672429.8061
290	686289.6710	1672938.5250	4060.76	OT-C542-LEACH-NG	686090.7698	1672453.6721
291	686294.6900	1672941.1720	4060.83	OT-C542-LEACH-NG	686095.7873	1672456.3184
292	686301.6970	1672938.9490	4060.85	OT-C542-LEACH-NG	686102.7923	1672454.0960
293	686305.7170	1672936.2850	4060.87	OT-C542-LEACH-NG	686106.8111	1672451.4328

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
294	686308.0670	1672931.0550	4060.89	OT-C542-LEACH-NG	686109.1604	1672446.2043
295	686304.8000	1672917.9090	4060.82	OT-C542-LEACH-NG	686105.8944	1672433.0621
296	686292.3740	1672901.2590	4060.90	OT-C542-LEACH-NG	686093.4720	1672416.4169
297	686283.4190	1672906.7050	4060.97	OT-C542-FFLUEN-NG	686084.5196	1672421.8614
298	686280.3770	1672902.6520	4060.94	OT-C542-FFLUEN-NG	686081.4785	1672417.8095
299	686276.9070	1672904.6420	4060.95	OT-C542-SEPTIC-NG	686078.0095	1672419.7990
300	686271.2980	1672896.9550	4060.80	OT-C542-SEPTIC-NG	686072.4021	1672412.1142
301	686281.9530	1672889.9350	4060.83	OT-C542-SEPTIC-NG	686083.0540	1672405.0962
302	686287.0950	1672896.6800	4060.88	OT-C542-SEPTIC-NG	686088.1945	1672411.8393
303	686285.7900	1672894.7150	4060.83	OT-C542-EFLUEN-NG	686086.8899	1672409.8748
304	686299.2270	1672887.1560	4060.87	OT-C542-EFLUEN-NG	686100.3230	1672402.3180
305	686310.9860	1672881.5880	4061.18	OT-C542-EFLUEN-NG	686112.0786	1672396.7516
306	686294.2970	1672858.0380	4060.90	OT-C542-BLDGCOR-NG	686095.3944	1672373.2085
307	686295.8820	1672844.1310	4061.28	OT-C542-BLDGCOR-NG	686096.9790	1672359.3055
308	686345.1390	1672922.4560	4060.89	OT-C542-BLDGCOR-NG	686146.2217	1672437.6078
309	686358.9780	1672924.0940	4061.42	OT-C542-BLDGCOR-NG	686160.0567	1672439.2453
310	686291.8860	1672885.1500	4060.65	OT-C542-STATION1-NG	686092.9841	1672400.3126
311	686275.2730	1672891.5340	4060.63	OT-C542-STATION2-NG	686076.3760	1672406.6948
312	686281.5390	1672904.6340	4060.73	OT-C542-STATION2-NG	686082.6401	1672419.7910
313	685750.1690	1671530.2910	4055.60	OT-C543-STATION2-NG	685551.4241	1671045.8463
314	685734.0730	1671548.8090	4055.84	OT-C543-STATION2	685535.3328	1671064.3589
315	685727.7350	1671514.3350	4055.33	OT-C543-STATION3	685528.9966	1671029.8949
316	685749.4390	1671546.6740	4055.91	OT-C543-EXSEPTIC	685550.6944	1671062.2245
317	685732.6430	1671545.5190	4055.74	OT-C543-EXSEPTIC	685533.9032	1671061.0699
318	685741.2600	1671557.0720	4056.32	OT-C543-EXSEPTIC	685542.5177	1671072.6195
319	685738.1510	1671537.7290	4055.62	OT-C543-EXSEPTIC	685539.4096	1671053.2821
320	685734.3520	1671541.2760	4055.65	OT-C543-FFLUEN	685535.6117	1671056.8281
321	685716.0920	1671515.5090	4055.04	OT-C543-FFLUEN	685517.3570	1671031.0686
322	685708.2650	1671520.5800	4055.23	OT-C543-LEACH	685509.5323	1671036.1381
323	685688.3040	1671512.0560	4055.52	OT-C543-LEACH	685489.5771	1671027.6166
324	685669.5610	1671502.3840	4055.36	OT-C543-LEACH	685470.8395	1671017.9474
325	685659.9210	1671495.2130	4055.04	OT-C543-LEACH	685461.2023	1671010.7784
326	685670.4020	1671495.5660	4055.43	OT-C543-MW-CASING	685471.6803	1671011.1313
327	685670.1370	1671495.6580	4055.13	OT-C543-MW-PVC	685471.4153	1671011.2233
328	685682.2550	1671485.7460	4055.16	OT-C543-LEACH	685483.5298	1671001.3142
329	685699.8070	1671491.2750	4054.76	OT-C543-LEACH	685501.0767	1671006.8416
330	685710.4840	1671499.0550	4055.06	OT-C543-LEACH	685511.7506	1671014.6193
331	685721.5030	1671508.4730	4055.40	OT-C543-LEACH	685522.7664	1671024.0346
332	685794.8190	1671498.3320	4056.84	OT-C543-EFLUEN	685596.0612	1671013.8965
333	685809.3600	1671495.0820	4059.27	OT-C543-BLDGCOR	685610.5980	1671010.6475
334	685776.9050	1671465.9090	4060.02	OT-C543-BLDGCOR	685578.1524	1670981.4829
335	685785.4230	1671455.8900	4060.26	OT-C543-BLDGCOR	685586.6679	1670971.4668
336	685744.8400	1671542.1950	4055.76	OT-C543-EFLUEN	685546.0967	1671057.7468
337	685303.6520	1671072.3550	4048.79	OT-C544-MW-CASING	685105.0365	1670588.0430
338	685303.3550	1671072.2840	4048.52	OT-C544-MW-PVC	685104.7396	1670587.9720
339	685349.4970	1671083.9730	4052.43	OT-C544-STATION1	685150.8683	1670599.6576
340	685342.4960	1671086.5980	4051.55	OT-C544-STATION1	685143.8693	1670602.2819
341	685336.0530	1671085.0120	4050.99	OT-C544-STATION1	685137.4282	1670600.6963
342	685336.7000	1671089.5480	4051.15	OT-C544-SEPTIC	685138.0750	1670605.2310
343	685338.4520	1671075.7050	4051.30	OT-C544-SEPTIC	685139.8265	1670591.3920
344	685347.8050	1671077.3720	4052.23	OT-C544-SEPTIC	685149.1768	1670593.0585
345	685345.6600	1671089.9410	4052.38	OT-C544-SEPTIC	685147.0324	1670605.6239
346	685356.1020	1671079.9660	4041.22	OT-C544-EFLUEN	685157.4713	1670595.6518
347	685347.2700	1671081.8770	4052.36	OT-C544-EFLUEN	685148.6419	1670597.5622
348	685337.4940	1671082.4320	4051.31	OT-C544-FFLUEN	685138.8687	1670598.1171
349	685335.1290	1671082.2690	4051.14	OT-C544-FFLUEN	685136.5044	1670597.9541
350	685336.2280	1671075.8560	4050.85	OT-C544-LEACH	685137.6031	1670591.5430
351	685323.3310	1671071.0830	4049.91	OT-C544-LEACH	685124.7098	1670586.7714
352	685297.8990	1671068.1360	4048.16	OT-C544-LEACH	685099.2852	1670583.8252
353	685296.9990	1671078.2660	4047.94	OT-C544-LEACH	685098.3855	1670593.9523
354	685317.0900	1671090.9580	4049.62	OT-C544-LEACH	685118.4707	1670606.6406
355	685334.6940	1671090.0750	4050.81	OT-C544-LEACH	685136.0696	1670605.7579
356	685360.4020	1671127.4140	4053.89	OT-C544-BLDGCOR	685161.7701	1670643.0860
357	685349.8450	1671114.5020	4052.32	OT-C544-BLDGCOR	685151.2162	1670630.1778
358	685360.3480	1671033.1240	4052.96	OT-C544-BLDGCOR	685161.7161	1670548.8234
359	685371.1230	1671022.2010	4053.70	OT-C544-BLDGCOR	685172.4880	1670537.9035
360	669828.5970	1693339.1960	4077.44	TU/US-C503-STATION1	669634.4665	1692848.4306
361	669823.8520	1693340.4930	4077.30	TU/US-C503-STATION2	669629.7229	1692849.7272
362	669816.1660	1693331.0930	4077.32	TU/US-C503-STATION3	669622.0391	1692840.3299
363	669804.9830	1693324.1990	4077.14	TU/US-C503-STATION5	669610.8594	1692833.4379
364	669830.2120	1693344.6950	4077.63	TU/US-C503-STATION4	669636.0811	1692853.9280

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
365	669820.3680	1693343.5050	4078.10	TU/US-C503-USTTANK	669626.2399	1692852.7383
366	669826.9160	1693337.2450	4077.78	TU/US-C503-USTTANK	669632.7860	1692846.4802
367	669831.7020	1693342.9300	4077.73	TU/US-C503-USTTANK	669637.5706	1692852.1635
368	669817.5060	1693300.2710	4077.28	TU/US-C503-BLDGCOR	669623.3788	1692809.5169
369	669817.0280	1693314.4610	4077.69	TU/US-C503-BLDGCOR	669622.9009	1692823.7028
370	669870.4630	1693326.6030	4077.24	TU/US-C503-BLDGCOR	669676.3204	1692835.8412
371	669857.6770	1693326.9550	4077.12	TU/US-C503-BLDGCOR	669663.5381	1692836.1931
372	669799.9830	1693280.8270	4076.53	TU/US-C503-BLDGCOR	669605.8608	1692790.0785
373	669786.0040	1693280.0690	4077.00	TU/US-C503-BLDGCOR	669591.8859	1692789.3207
374	669753.1970	1693299.5360	4076.55	TU/US-C503-MW1-CASIN	669559.0884	1692808.7821
375	669753.0160	1693299.6510	4076.22	TU/US-C503-MW1-PVC	669558.9075	1692808.8971
376	669717.9520	1693348.6000	4074.92	TU/US-C503-MW3-PVC	669523.8536	1692857.8319
377	669718.0930	1693348.2730	4075.65	TU/US-C503-MW3-CASIN	669523.9946	1692857.5050
378	669746.8950	1693329.2100	4076.92	TU/US-C503-BLDGCOR	669552.7882	1692838.4475
379	669747.5820	1693308.1150	4076.21	TU/US-C503-BLDGCOR	669553.4750	1692817.3586
380	669906.5180	1693361.1640	4077.43	TU/US-C503-MW2-CASIN	669712.3650	1692870.3922
381	669906.2520	1693361.2650	4077.07	TU/US-C503-MW2-PVC	669712.0990	1692870.4932
382	669887.0390	1693344.8910	4077.53	TU/US-C503-BLDGCOR	669692.8916	1692854.1239
383	669886.0230	1693359.0930	4077.99	TU/US-C503-BLDGCOR	669691.8759	1692868.3218
384	670862.3470	1691695.2520	4072.78	TU/US-C500-MW1-CASIN	670667.9169	1691204.9630
385	670862.1340	1691695.4850	4072.39	TU/US-C500-MW1-PVC	670667.7040	1691205.1960
386	670897.1420	1691671.0590	4072.25	TU/US-C500-MW2-PVC	670702.7019	1691180.7771
387	670897.3420	1691670.8340	4072.66	TU/US-C500-MW2-CASIN	670702.9018	1691180.5521
388	670997.2710	1691721.0890	4072.90	TU/US-C500-MW3-CASIN	670802.8018	1691230.7926
389	670996.9840	1691721.2540	4072.41	TU/US-C500-MW3-PVC	670802.5149	1691230.9575
390	670952.1640	1691699.4910	4072.04	TU/US-C500-STATION1	670757.7079	1691209.2008
391	670948.0960	1691682.1740	4072.36	TU/US-C500-STATION4	670753.6411	1691191.8888
392	670936.4590	1691683.8290	4072.05	TU/US-C500-STATION5	670742.0075	1691193.5434
393	670929.6330	1691690.0950	4072.11	TU/US-C500-STATION2	670735.1834	1691199.8075
394	670923.0530	1691673.0510	4072.18	TU/US-C500-STATION3	670728.6054	1691182.7685
395	670946.5050	1691708.7370	4072.40	TU/US-C500-USTPIT	670752.0506	1691218.4441
396	670961.7540	1691693.8260	4072.62	TU/US-C500-USTPIT	670767.2951	1691203.5375
397	670931.1680	1691662.3970	4072.93	TU/US-C500-USTPIT	670736.7180	1691172.1176
398	670915.4940	1691676.4560	4072.43	TU/US-C500-USTPIT	670721.0485	1691186.1725
399	670921.7940	1691667.6910	4072.61	TU/US-C500-BLDGCOR	670727.3467	1691177.4100
400	670938.3020	1691685.3670	4072.19	TU/US-C500-BLDGCOR	670743.8499	1691195.0809
401	670954.8550	1691686.5260	4072.52	TU/US-C500-BLDGCOR	670760.3981	1691196.2396
402	670964.2580	1691691.8600	4072.50	TU/US-C500-BLDGCOR	670769.7984	1691201.5720
403	670981.1410	1691692.8760	4072.84	TU/US-C500-BLDGCOR	670786.6765	1691202.5877
404	681138.2190	1690535.4430	4109.80	OT-C538-MW1-CASING	680940.8108	1690045.4902
405	681137.9660	1690535.5040	4109.43	OT-C538-MW1-PVC	680940.5579	1690045.5512
406	681154.3000	1690506.8540	4109.64	OT-C538-STATION3	680956.8871	1690016.9095
407	681170.7650	1690504.3700	4110.30	OT-C538-STATION2	680973.3473	1690014.4262
408	681207.7160	1690542.9160	4110.07	OT-C538-STATION1	681010.2876	1690052.9610
409	681171.2020	1690513.1430	4110.35	OT-C538-SEPTIC	680973.7842	1690023.1966
410	681160.8350	1690514.8700	4110.22	OT-C538-SEPTIC	680963.4202	1690024.9231
411	681157.5830	1690502.2430	4109.87	OT-C538-SEPTIC	680960.1692	1690012.2998
412	681168.6240	1690500.8410	4110.30	OT-C538-SEPTIC	680971.2070	1690010.8982
413	681157.7430	1690507.8780	4109.92	OT-C538-FFLUEN	680960.3291	1690017.9332
414	681149.7900	1690513.8560	4109.82	OT-C538-FFLUEN	680952.3784	1690023.9094
415	681146.2870	1690511.1610	4109.76	OT-C538-LEACH	680948.8764	1690021.2152
416	681140.0690	1690516.2140	4109.76	OT-C538-LEACH	680942.6602	1690026.2667
417	681131.8360	1690535.6580	4109.59	OT-C538-LEACH	680934.4296	1690045.7051
418	681142.3480	1690541.6090	4109.45	OT-C538-LEACH	680944.9386	1690051.6544
419	681148.4850	1690524.6340	4109.80	OT-C538-LEACH	680951.0738	1690034.6843
420	681152.9240	1690518.6140	4110.01	OT-C538-LEACH	680955.5115	1690028.6661
421	681171.0630	1690513.0040	4110.32	OT-C538-EFLUEN	680973.6453	1690023.0577
422	681199.3120	1690534.6340	4109.92	OT-C538-EFLUEN	681001.8861	1690044.6814
423	681311.9210	1690619.8910	4111.94	OT-C538-EFLUEN	681114.4624	1690129.9137
424	681378.0600	1690614.8720	4112.52	OT-C538-EFLUEN	681180.5823	1690124.8962
425	681511.9950	1690621.0250	4112.35	OT-C538-EFLUEN-C/O	681314.4785	1690131.0474
426	681543.8210	1690614.3290	4112.13	OT-C538-EFLUEN-C/O	681346.2952	1690124.3533
427	681545.1500	1690624.0320	4110.59	OT-C538-EFLUEN	681347.6238	1690134.0535
428	681526.9290	1690617.7410	4112.19	OT-C538-BLDGCOR	681329.4081	1690127.7643
429	681516.5600	1690627.6780	4112.22	OT-C538-BLDGCOR	681319.0421	1690137.6984
430	681517.0030	1690674.6590	4112.55	OT-C538-BLDGCOR	681319.4850	1690184.6658
431	681526.9640	1690685.0850	4112.68	OT-C538-BLDGCOR	681329.4431	1690195.0888
432	681610.3380	1690617.1910	4112.15	OT-C538-BLDGCOR	681412.7929	1690127.2145
433	681620.0290	1690626.9090	4112.29	OT-C538-BLDGCOR	681422.4811	1690136.9297
434	681248.7970	1690511.7190	4110.11	OT-C537-STATION1	681051.3567	1690021.7731
435	681230.2540	1690505.9940	4109.96	OT-C537-STATION2	681032.8191	1690016.0497

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
436	681220.0430	1690509.7920	4110.12	OT-C537-STATION3	681022.6111	1690019.8466
437	681224.9030	1690501.6020	4109.95	OT-C537-SEPTICDRY	681027.4697	1690011.6590
438	681224.2220	1690518.0560	4110.28	OT-C537-SEPTICDRY	681026.7889	1690028.1082
439	681236.7540	1690518.9910	4110.31	OT-C537-SEPTICDRY	681039.3172	1690029.0429
440	681236.4080	1690501.8520	4110.13	OT-C537-SEPTICDRY	681038.9713	1690011.9089
441	681237.2180	1690508.8330	4110.12	OT-C537-INLINE	681039.7811	1690018.8879
442	681311.7430	1690515.4440	4111.03	OT-C537-INLINE	681114.2845	1690025.4970
443	670561.7210	1680587.5740	4050.10	TU/US-C506-MW2-CASIN	670367.3781	1680100.5043
444	670561.4170	1680587.6760	4049.68	TU/US-C506-MW2-PVC	670367.0742	1680100.6062
445	670504.3430	1680580.0920	4050.14	TU/US-C506-MW1-PVC	670310.0167	1680093.0244
446	670504.5340	1680580.0020	4050.56	TU/US-C506-MW1-CASIN	670310.2076	1680092.9345
447	670508.2600	1680580.6030	4050.26	TU/US-C506-USTTANK	670313.9326	1680093.5353
448	670507.1490	1680575.9500	4050.27	TU/US-C506-USTTANK	670312.8219	1680088.8836
449	670517.9280	1680578.9030	4050.27	TU/US-C506-USTTANK	670323.5978	1680091.8358
450	670517.4300	1680574.2280	4050.28	TU/US-C506-USTTANK	670323.0999	1680087.1621
451	670507.9350	1680578.1630	4050.18	TU/US-C506-STATION1	670313.6077	1680091.0960
452	670513.3690	1680579.8330	4050.20	TU/US-C506-STATION2	670319.0401	1680092.7655
453	670517.9640	1680576.4150	4050.25	TU/US-C506-STATION3	670323.6338	1680089.3485
454	670511.2330	1680575.3810	4050.12	TU/US-C506-STATION4	670316.9047	1680088.3148
455	670512.5770	1680577.6370	4050.16	TU/US-C506-STATION5	670318.2483	1680090.5702
456	670485.1820	1680557.6150	4050.53	TU/US-C506-EXMW1-CAS	670290.8613	1680070.5540
457	670484.8980	1680557.6790	4050.38	TU/US-C506-EXMW1-PVC	670290.5773	1680070.6179
458	670494.8180	1680553.5430	4050.36	TU/US-C506-BLDGCOR	670300.4945	1680066.4831
459	670506.7310	1680561.7710	4050.38	TU/US-C506-BLDGCOR	670312.4040	1680074.7088
460	670510.1770	1680607.5970	4050.36	TU/US-C506-BLDGCOR	670315.8490	1680120.5215
461	670507.2460	1680618.1900	4050.39	TU/US-C506-BLDGCOR	670312.9189	1680131.1114
462	672564.5350	1692766.5990	4084.67	OT-C530-STATION1	672369.6116	1692275.9995
463	672567.1650	1692774.7240	4084.79	OT-C530-STATION2	672372.2409	1692284.1222
464	672567.5210	1692771.2850	4084.93	OT-C530-ACTSEPTIC	672372.5967	1692280.6842
465	672572.0780	1692767.3740	4084.89	OT-C530-ACTSEPTIC	672377.1524	1692276.7743
466	672575.8660	1692771.9070	4084.91	OT-C530-ACTSEPTIC	672380.9393	1692281.3060
467	672571.4280	1692775.8290	4084.95	OT-C530-ACTSEPTIC	672376.5026	1692285.2269
468	672569.6900	1692769.3550	4084.91	OT-C530-INLINE	672374.7651	1692278.7547
469	672563.6000	1692772.1360	4084.83	OT-C530-MW-CASING	672368.6769	1692281.5349
470	672563.2920	1692772.2960	4084.49	OT-C530-MW-PVC	672368.3690	1692281.6949
471	672509.9810	1692700.4750	4085.41	OT-C530-INLINE	672315.0734	1692209.8947
472	672538.3940	1692677.7240	4085.37	OT-C530-BLDGCOR	672343.4782	1692187.1503
473	672538.9710	1692663.8680	4085.27	OT-C530-BLDGCOR	672344.0550	1692173.2983
474	672478.3960	1692731.8290	4085.45	OT-C530-BLDGCOR	672283.4976	1692241.2396
475	672485.2490	1692739.1720	4085.12	OT-C530-BLDGCOR	672290.3486	1692248.5805
476	685978.3640	1686617.0530	4101.95	OT-C534-STATION1	685779.5530	1686128.2358
477	685949.9370	1686623.2970	4101.80	OT-C534-STATION2	685751.1342	1686134.4780
478	686041.6810	1686591.0650	4102.58	OT-C534-BLDGCOR	685842.8517	1686102.2553
479	686050.4200	1686580.6970	4102.78	OT-C534-BLDGCOR	685851.5881	1686091.8903
480	686053.7100	1686616.8100	4102.90	OT-C534-BLDGCOR	685854.8772	1686127.9929
481	686043.1140	1686607.6280	4102.82	OT-C534-BLDGCOR	685844.2842	1686118.8135
482	670482.5190	1680558.2400	4050.60	TU/US-C506-MW3-CASIN	670288.1990	1680071.1788
483	670482.3210	1680558.1750	4050.11	TU/US-C506-MW3-PVC	670288.0011	1680071.1138
484	669451.6250	1685381.2210	4054.88	TU/US-C515-STATION1	669257.6038	1684892.7620
485	669456.5920	1685373.9060	4054.66	TU/US-C515-STATION2	669262.5694	1684885.4491
486	669447.7270	1685364.3830	4054.13	TU/US-C515-STATION3	669253.7069	1684875.9289
487	669442.7430	1685375.3260	4054.34	TU/US-C515-STATION4	669248.7244	1684886.8687
488	669450.0780	1685373.9310	4054.62	TU/US-C515-STATION5	669256.0572	1684885.4741
489	669529.8630	1685390.3120	4053.57	TU/US-C515-MW3-PVC	669335.8191	1684901.8503
490	669530.0710	1685390.1630	4053.84	TU/US-C515-MW3-CASIN	669336.0271	1684901.7014
491	669347.3380	1685357.3580	4053.37	TU/US-C515-MW2-CASIN	669153.3470	1684868.9059
492	669347.0390	1685357.4240	4052.93	TU/US-C515-MW2-PVC	669153.0481	1684868.9719
493	669367.7310	1685396.1250	4053.43	TU/US-C515-MW1-PVC	669173.7341	1684907.6617
494	669368.0180	1685396.0880	4053.86	TU/US-C515-MW1-CASIN	669174.0210	1684907.6247
495	669413.7390	1685386.4140	4054.97	TU/US-C515-BLDGCOR	669219.7288	1684897.9535
496	669405.0760	1685397.5400	4056.39	TU/US-C515-BLDGCOR	669211.0683	1684909.0762
497	669442.6490	1685383.8010	4054.90	TU/US-C515-TANKPIT	669248.6304	1684895.3412
498	669458.4310	1685381.6630	4055.08	TU/US-C515-TANKPIT	669264.4078	1684893.2039
499	669454.7400	1685363.6010	4054.47	TU/US-C515-TANKPIT	669260.7179	1684875.1471
500	669440.8050	1685364.3540	4054.07	TU/US-C515-TANKPIT	669246.7869	1684875.8999
501	669474.3460	1685377.9770	4054.82	TU/US-C515-BLDGCOR	669280.3182	1684889.5189
502	669485.4880	1685386.3880	4055.07	TU/US-C515-BLDGCOR	669291.4570	1684897.9275
503	669257.8420	1685415.0700	4053.20	TU/US-C513-STATION3	669063.8770	1684926.6012
504	669241.6200	1685431.8260	4053.43	TU/US-C513-STATION2	669047.6597	1684943.3523
505	669234.6840	1685421.2410	4053.75	TU/US-C513-STATION5	669040.7257	1684932.7704
506	669232.2550	1685409.8190	4053.42	TU/US-C513-STATION4	669038.2974	1684921.3517

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

Corrections

Point #515
TU/US-515-MW3 PVC

Point #518
TU/US-515-MW2

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
507	669220.1400	1685422.8010	4053.52	TU/US-C513-STATION1	669026.1859	1684934.3299
508	669222.4590	1685431.2530	4053.64	TU/US-C513-TANKPIT	669028.5042	1684942.7795
509	669219.3990	1685411.0450	4054.92	TU/US-C513-TANKPIT	669025.4451	1684922.5773
510	669260.7320	1685426.0370	4053.70	TU/US-C513-TANKPIT	669066.7661	1684937.5650
511	669277.6950	1685433.5720	4053.31	TU/US-C513-MW2-CASIN	669083.7242	1684945.0978
512	669243.5650	1685418.8110	4054.36	TU/US-C513-TRANSPAD	669049.6041	1684930.3411
513	669236.4970	1685419.8090	4054.30	TU/US-C513-TRANSPAD	669042.5381	1684931.3388
514	669235.5680	1685411.9050	4054.57	TU/US-C513-TRANSPAD	669041.6094	1684923.4371
515	669277.6850	1685433.6210	4053.26	TU/US-C513-MW2-C[illegible] PVC	669083.7142	1684945.1468 → MW3
516	669188.9570	1685441.5400	4053.76	TU/US-C513-MW1-CASIN	668995.0119	1684953.0635
517	669188.7180	1685441.6230	4053.31	TU/US-C513-MW1-PVC	668994.7730	1684953.1465
518	669175.0530	1685411.5360	4053.78	TU/US-C513-MW3-PVC	668981.1120	1684923.0682 → MW2
519	669175.2900	1685411.4450	4054.15	TU/US-C513-MW3-CASIN	668981.3489	1684922.9772
520	669194.6820	1685411.4540	4054.72	TU/US-C513-BLDGCOR	669000.7353	1684922.9862
521	669205.8290	1685420.1440	4054.47	TU/US-C513-BLDGCOR	669011.8790	1684931.6737
522	669292.6520	1685418.3920	4053.83	TU/US-C513-BLDGCOR	669098.6769	1684929.9222
523	669293.9380	1685428.2990	4053.77	TU/US-C513-BLDGCOR	669099.9625	1684939.8263
524	685879.9040	1686627.7590	4102.02	OTC-534-CASING	685681.1215	1686138.9387
525	685879.6290	1686627.7910	4101.61	OTC-534-PVC	685680.8466	1686138.9707
526	685894.0510	1686651.2940	4102.15	OTC-534-MW6-CASING	685695.2644	1686162.4669
527	685893.7240	1686651.3020	4101.74	OTC-534-MW6-PVC	685694.9375	1686162.4749
528	685866.3710	1686655.8860	4101.59	OTC-534-MW8-PVC	685667.5925	1686167.0576
529	685866.6060	1686655.6520	4102.06	OTC-534-MW8-CASING	685667.8274	1686166.8236
530	685876.1160	1686687.3140	4102.11	OTC-534-MW5-CASING	685677.3346	1686198.4764
531	685875.8760	1686687.4250	4101.81	OTC-534-MW5-PVC	685677.0947	1686198.5874
532	685834.9910	1686704.4610	4101.83	OTC-534-MW9-PVC	685636.2216	1686215.6185
533	685835.2820	1686704.5300	4102.15	OTC-534-MW9-CASING	685636.5125	1686215.6875
534	685772.4780	1686595.2240	4101.45	OTC-534-MW10-NG	685573.7267	1686106.4131
535	669081.1480	1678793.1860	4046.72	OTC-531B-SEPTANK	668887.2342	1678306.6363
536	669082.4390	1678801.3130	4046.63	OTC-531B-SEPTANK	668888.5248	1678314.7610
537	669072.3810	1678802.9790	4046.81	OTC-531B-SEPTANK	668878.4697	1678316.4265
538	669070.8860	1678795.3530	4046.82	OTC-531B-SEPTANK	668876.9751	1678308.8027
539	669104.1410	1678787.7690	4045.69	OTC-531B-STATION-1	668910.2205	1678301.2209
540	669070.9690	1678801.9800	4046.52	OTC-531B-STATION-2	668877.0581	1678315.4278
541	669061.4820	1678787.2510	4046.24	OTC-531B-STATION-3	668867.5739	1678300.7031
542	669022.2810	1678760.4940	4045.98	OTC-531B-MW-1-PVC	668828.3842	1678273.9538
543	669022.4740	1678760.4670	4046.35	OTC-531B-MW-1-CASING	668828.5772	1678273.9268
544	669029.7060	1678750.8610	4046.12	OTC-531B-LEACH	668835.8071	1678264.3236
545	669044.0770	1678753.3070	4046.04	OTC-531B-LEACH	668850.1739	1678266.7689
546	669048.2090	1678762.3910	4046.19	OTC-531B-LEACH	668854.3047	1678275.8503
547	669052.8600	1678773.5200	4046.17	OTC-531B-LEACH	668858.9544	1678286.9760
548	669051.8580	1678782.0380	4046.19	OTC-531B-LEACH	668857.9527	1678295.4916
549	669045.9680	1678791.0410	4045.97	OTC-531B-LEACH	668852.0644	1678304.4920
550	669037.6080	1678787.3270	4046.05	OTC-531B-LEACH	668843.7068	1678300.7790
551	669030.8940	1678787.9690	4046.07	OTC-531B-LEACH	668836.9947	1678301.4208
552	669024.6850	1678794.4050	4045.99	OTC-531B-LEACH	668830.7875	1678307.8550
553	669012.0060	1678808.0140	4045.98	OTC-531B-LEACH	668818.1122	1678321.4600
554	669005.0390	1678788.3970	4045.95	OTC-531B-LEACH	668811.1472	1678301.8487
555	669008.1540	1678771.5710	4046.05	OTC-531B-LEACH	668814.2613	1678285.0276
556	669012.3090	1678761.0960	4046.10	OTC-531B-LEACH	668818.4151	1678274.5556
557	669052.5660	1678784.6580	4046.08	OTC-531B-FLINE	668858.6605	1678298.1108
558	669071.4380	1678798.9230	4046.55	OTC-531B-FLINE	668877.5270	1678312.3717
559	669082.2160	1678797.7200	4046.58	OTC-531B-ELINE	668888.3019	1678311.1690
560	669109.7160	1678792.3340	4045.64	OTC-531B-ELINE	668915.7939	1678305.7846
561	669130.6340	1678787.5660	4047.05	OTC-531B-ELINE	668936.7058	1678301.0180
562	669132.6960	1678800.0880	4046.87	OTC-531B-BLDGCOR	668938.7672	1678313.5363
563	669139.6540	1678804.9540	4046.97	OTC-531B-BLDGCOR	668945.7232	1678318.4009
564	669127.3740	1678771.5760	4046.72	OTC-531B-BLDGCOR	668933.4468	1678285.0326
565	669131.8520	1678764.6150	4047.25	OTC-531B-BLDGCOR	668937.9235	1678278.0736
566	668593.1300	1678901.9680	4046.19	OTC-531C-BLDGCOR	668399.3576	1678415.3868
567	668588.1250	1678902.8360	4046.21	OTC-531C-BLDGCOR	668394.3541	1678416.2546
568	668585.3350	1678865.5840	4046.55	OTC-531C-BLDGCOR	668391.5649	1678379.0133
569	668590.1110	1678858.6070	4046.53	OTC-531C-BLDGCOR	668396.3395	1678372.0384
570	668590.3090	1678889.4560	4045.95	OTC-531C-ELINE	668396.5374	1678402.8784
571	668578.4210	1678891.4650	4046.03	OTC-531C-ELINE	668384.6529	1678404.8868
572	668560.7680	1678894.7530	4045.47	OTC-531C-ELINE	668367.0050	1678408.1739
573	668535.6480	1678899.2930	4046.35	OTC-531C-ELINE	668341.8923	1678412.7126
574	668535.0660	1678896.4960	4046.68	OTC-531C-SEPTIC	668341.3104	1678409.9164
575	668535.3940	1678905.9700	4046.47	OTC-531C-SEPTIC	668341.6383	1678419.3876
576	668522.2510	1678906.9450	4046.51	OTC-531C-SEPTIC	668328.4992	1678420.3624
577	668522.3100	1678897.4040	4046.39	OTC-531C-SEPTIC	668328.5581	1678410.8241

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
578	668561.9930	1678890.5660	4045.66	OTC-531C-STATION-1	668368.2296	1678403.9881
579	668531.2500	1678902.0810	4046.55	OTC-531C-STATION-2	668337.4955	1678415.4998
580	668522.9580	1678893.5110	4045.84	OTC-531C-STATION-3	668329.2059	1678406.9323
581	668521.6100	1678902.7660	4046.16	OTC-531C-FLINE	668327.8583	1678416.1846
582	668515.2610	1678901.5740	4045.66	OTC-531C-FLINE	668321.5112	1678414.9929
583	668515.8520	1678907.4010	4045.67	OTC-531C-LEACH	668322.1020	1678420.8182
584	668498.6960	1678906.8280	4045.81	OTC-531C-LEACH	668304.9510	1678420.2454
585	668489.9270	1678907.6430	4045.74	OTC-531C-LEACH	668296.1845	1678421.0602
586	668481.5760	1678902.8790	4045.69	OTC-531C-LEACH	668287.8359	1678416.2975
587	668476.1180	1678891.3230	4045.84	OTC-531C-LEACH	668282.3795	1678404.7449
588	668473.4290	1678883.0340	4045.68	OTC-531C-LEACH	668279.6913	1678396.4583
589	668473.7340	1678874.2510	4045.53	OTC-531C-LEACH	668279.9962	1678387.6778
590	668476.2360	1678867.2340	4045.54	OTC-531C-LEACH	668282.4975	1678380.6629
591	668482.1720	1678868.3950	4045.45	OTC-531C-MW-1-PVC	668288.4318	1678381.8235
592	668482.4510	1678868.3680	4045.85	OTC-531C-MW-1-CASING	668288.7107	1678381.7965
593	668490.9400	1678863.0190	4045.60	OTC-531C-LEACH	668297.1972	1678376.4491
594	668503.3450	1678866.8310	4045.87	OTC-531C-LEACH	668309.5986	1678380.2600
595	668508.4050	1678874.1920	4045.93	OTC-531C-LEACH	668314.6572	1678387.6189
596	668515.8970	1678879.7420	4045.82	OTC-531C-LEACH	668322.1470	1678393.1672
597	668524.3970	1678890.3500	4045.70	OTC-531C-LEACH	668330.6445	1678403.7722
598	667495.6300	1679128.7300	4042.53	OTC-532-BLDGCOR	667302.1757	1678642.0831
599	667488.6400	1679123.9580	4042.71	OTC-532-BLDGCOR	667295.1877	1678637.3125
600	667462.6660	1679059.4970	4041.10	OTC-532-BLDGCOR	667269.2212	1678572.8701
601	667481.1840	1679050.1710	4042.61	OTC-532-BLDGCOR	667287.7339	1678563.5469
602	667486.0130	1679106.7520	4042.73	OTC-532-ELINE	667292.5615	1678620.1115
603	667462.4800	1679111.5030	4040.38	OTC-532-ELINE	667269.0353	1678624.8611
604	667462.2250	1679114.4150	4040.62	OTC-532-STATION-1	667268.7804	1678627.7722
605	667442.0090	1679119.1410	4041.24	OTC-532-STATION-2	667248.5702	1678632.4969
606	667419.1640	1679115.1840	4040.86	OTC-532-STATION-3	667225.7319	1678628.5410
607	667385.6930	1679101.6040	4040.50	OTC-532-STATION-4	667192.2706	1678614.9649
608	667381.8850	1679101.5680	4040.62	OTC-532-LEACH	667188.4637	1678614.9290
609	667383.6400	1679091.6130	4040.63	OTC-532-LEACH	667190.2181	1678604.9768
610	667385.4250	1679087.0370	4040.57	OTC-532-LEACH	667192.0026	1678600.4022
611	667388.9960	1679084.4040	4040.65	OTC-532-LEACH	667195.5726	1678597.7699
612	667394.2390	1679084.6140	4040.73	OTC-532-LEACH	667200.8141	1678597.9799
613	667396.1210	1679092.7430	4040.70	OTC-532-LEACH	667202.6955	1678606.1065
614	667398.1240	1679100.9150	4040.70	OTC-532-LEACH	667204.6979	1678614.2761
615	667402.2360	1679106.9240	4040.75	OTC-532-LEACH	667208.8088	1678620.2834
616	667410.1270	1679109.8530	4040.82	OTC-532-LEACH	667216.6975	1678623.2116
617	667419.4540	1679110.1630	4040.85	OTC-532-LEACH	667226.0218	1678623.5215
618	667420.7270	1679120.1400	4041.02	OTC-532-FLINE	667227.2944	1678633.4956
619	667423.8510	1679141.7780	4040.59	OTC-532-LEACH	667230.4175	1678655.1273
620	667412.2990	1679143.4760	4040.74	OTC-532-LEACH	667218.8688	1678656.8248
621	667403.7350	1679143.1670	4040.80	OTC-532-LEACH	667210.3073	1678656.5159
622	667397.0900	1679139.6510	4040.75	OTC-532-LEACH	667203.6642	1678653.0009
623	667384.3300	1679127.9250	4040.44	OTC-532-LEACH	667190.9079	1678641.2783
624	667382.6070	1679116.1130	4040.44	OTC-532-LEACH	667189.1854	1678629.4697
625	667430.4810	1679118.6630	4041.32	OTC-532-FLINE	667237.0456	1678632.0190
626	667430.2210	1679114.2980	4041.25	OTC-532-SEPTIC	667236.7856	1678627.6553
627	667440.5880	1679113.0200	4041.26	OTC-532-SEPTIC	667247.1496	1678626.3776
628	667442.9470	1679123.3120	4041.21	OTC-532-SEPTIC	667249.5080	1678636.6667
629	667430.1210	1679125.8580	4041.28	OTC-532-SEPTIC	667236.6857	1678639.2119
630	667441.8110	1679116.2010	4041.27	OTC-532-ELINE	667248.3723	1678629.5577
631	669659.5140	1678688.1920	4048.05	OTC-531A-ELINE	669465.4326	1678201.6728
632	669645.1200	1678691.4170	4047.42	OTC-531A-ELINE	669451.0427	1678204.8968
633	669626.5240	1678694.6570	4048.54	OTC-531A-ELINE	669432.4521	1678208.1359
634	669625.4550	1678690.5680	4048.58	OTC-531A-SEPTIC	669431.3834	1678204.0481
635	669627.0130	1678697.2200	4048.59	OTC-531A-SEPTIC	669432.9410	1678210.6981
636	669614.1180	1678700.1730	4048.60	OTC-531A-SEPTIC	669420.0497	1678213.6503
637	669613.0940	1678693.8150	4048.72	OTC-531A-SEPTIC	669419.0260	1678207.2941
638	669648.5430	1678685.0250	4047.24	OTC-531A-STATION-1	669454.4647	1678198.5067
639	669615.3510	1678691.9600	4048.59	OTC-531A-STATION-2	669421.2823	1678205.4397
640	669607.0140	1678691.1700	4048.42	OTC-531A-STATION-3	669412.9478	1678204.6499
641	669606.7200	1678688.2040	4048.56	OTC-531A-LEACH	669412.6539	1678201.6848
642	669608.9270	1678706.1330	4048.28	OTC-531A-LEACH	669414.8602	1678219.6086
643	669601.3790	1678707.8980	4048.13	OTC-531A-LEACH	669407.3144	1678221.3730
644	669593.2420	1678708.2220	4047.49	OTC-531A-LEACH	669399.1798	1678221.6970
645	669578.1380	1678708.5010	4047.22	OTC-531A-LEACH	669384.0801	1678221.9759
646	669565.0490	1678706.1840	4047.29	OTC-531A-LEACH	669370.9949	1678219.6595
647	669554.2260	1678694.3690	4047.37	OTC-531A-LEACH	669360.1751	1678207.8480
648	669553.4160	1678687.6760	4047.59	OTC-531A-LEACH	669359.3653	1678201.1569

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
649	669552.5940	1678678.4030	4047.76	OTC-531A-LEACH	669358.5435	1678191.8866
650	669550.0120	1678656.4050	4047.76	OTC-531A-LEACH	669355.9623	1678169.8950
651	669556.1880	1678652.3190	4047.86	OTC-531A-LEACH	669362.1365	1678165.8102
652	669559.2580	1678655.8340	4047.38	OTC-531A-MW-1-PVC	669365.2056	1678169.3241
653	669559.5100	1678655.7600	4047.78	OTC-531A-MW-1-CASING	669365.4575	1678169.2502
654	669561.9190	1678650.8880	4047.69	OTC-531A-LEACH	669367.8658	1678164.3796
655	669569.0970	1678659.8040	4048.02	OTC-531A-LEACH	669375.0418	1678173.2930
656	669574.5390	1678669.0420	4047.77	OTC-531A-LEACH	669380.4822	1678182.5283
657	669580.0480	1678677.6210	4047.77	OTC-531A-LEACH	669385.9896	1678191.1048
658	669581.1180	1678685.2190	4047.72	OTC-531A-LEACH	669387.0593	1678198.7006
659	669589.3790	1678690.0080	4047.91	OTC-531A-LEACH	669395.3179	1678203.4882
660	669598.7410	1678687.4540	4047.88	OTC-531A-LEACH	669404.6772	1678200.9350
661	669608.6000	1678697.8630	4048.38	OTC-531A-FLINE	669414.5333	1678211.3410
662	669613.4950	1678697.0050	4048.61	OTC-531A-FLINE	669419.4269	1678210.4832
663	669434.7190	1685385.1220	4055.15	US/TC-515-EXAVATION	669240.7027	1684896.6618
664	669433.7320	1685375.0770	4054.68	US/TC-515-EXAVATION	669239.7160	1684886.6198
665	669453.6100	1685372.2880	4054.89	US/TC-515-EXAVATION	669259.5882	1684883.8316
666	669455.2490	1685382.6100	4055.08	US/TC-515-EXAVATION	669261.2268	1684894.1506
667	669423.1290	1685379.3360	4054.73	US/TC-515-POTHOLE-1	669229.1161	1684890.8775
668	669443.7270	1685362.1260	4054.20	US/TC-515-POTHOLE-2	669249.7081	1684873.6725
669	669443.2340	1685352.4030	4053.69	US/TC-515-POTHOLE-3	669249.2152	1684863.9523
670	669388.8600	1685382.9350	4054.36	US/TC-515-POTHOLE-4	669194.8570	1684894.4755
671	666075.3380	1693454.3920	4059.75	US/TC-502-TANK/EX	665882.2953	1692963.5932
672	666064.5480	1693454.6090	4059.59	US/TC-502-TANK/EX	665871.5084	1692963.8101
673	666064.5890	1693463.2320	4059.66	US/TC-502-TANK/EX	665871.5494	1692972.4306
674	666075.7420	1693463.6580	4059.85	US/TC-502-TANK/EX	665882.6992	1692972.8565
675	666070.2430	1693458.8620	4059.56	US/TC-502-STATION-1	665877.2018	1692968.0619
676	666075.3470	1693459.1030	4059.61	US/TC-502-STATION-2	665882.3043	1692968.3028
677	666070.4890	1693455.0470	4059.46	US/TC-502-STATION-3	665877.4477	1692964.2480
678	666070.2650	1693463.1340	4059.49	US/TC-502-STATION-4	665877.2238	1692972.3327
679	666072.2440	1693503.2780	4060.12	US/TC-502-FIREHY	665879.2022	1693012.4650
680	669813.9600	1693315.1950	4077.70	US/TC-503-EXAVATION	669619.8338	1692824.4365
681	669826.0790	1693326.7460	4077.45	US/TC-503-EXAVATION	669631.9493	1692835.9842
682	669815.4720	1693337.1950	4077.67	US/TC-503-EXAVATION	669621.3454	1692846.4302
683	669803.8000	1693324.4750	4077.59	US/TC-503-EXAVATION	669609.6767	1692833.7139
684	669818.2990	1693319.1730	4077.48	US/TC-503-BEGTRENCH	669624.1715	1692828.4134
685	669837.0790	1693303.2490	4076.88	US/TC-503-ENDTRENCH	669642.9461	1692812.4940
686	681138.0180	1690539.4590	4109.33	OTC-538-STATION-5	680940.6098	1690049.5050
687	673758.3950	1683356.5480	4060.55	US/TC-514-STATION-1	673563.1256	1682868.6758
688	673765.5540	1683358.1250	4060.47	US/TC-514-STATION-2	673570.2825	1682870.2523
689	673770.0890	1683350.4240	4060.48	US/TC-514-STATION-3	673574.8162	1682862.5535
690	673768.2490	1683354.2670	4060.48	US/TC-514-STATION-4	673572.9768	1682866.3954
691	673777.4280	1683353.4050	4060.71	US/TC-514-STATION-5	673582.1531	1682865.5337
692	673776.8350	1683359.0390	4060.94	US/TC-514-BLDGCOR	673581.5603	1682871.1661
693	673769.7480	1683353.9100	4060.70	US/TC-514-BLDGCOR	673574.4753	1682866.0385
694	673778.8570	1683370.4750	4060.92	US/TC-514-BLDGCOR	673583.5817	1682882.5987
695	673773.9440	1683377.3380	4060.70	US/TC-514-BLDGCOR	673578.6701	1682889.4597
696	673723.3370	1683411.0030	4060.56	US/TC-514-MW-1-PVC	673528.0778	1682923.1150
697	673723.6160	1683410.9000	4061.02	US/TC-514-MW-1-CASIN	673528.3567	1682923.0120
698	673699.2890	1683380.7720	4061.09	US/TC-514-MW-2-CASIN	673504.0367	1682892.8928
699	673698.9660	1683380.8260	4060.66	US/TC-514-MW-2-PVC	673503.7138	1682892.9467
700	673812.5550	1683317.4880	4060.43	US/TC-514-MW-3-PVC	673617.2699	1682829.6271
701	673812.8820	1683317.4350	4060.76	US/TC-514-MW-3-CASIN	673617.5968	1682829.5741
702	673776.7270	1683350.1350	4060.82	US/TC-514-FORM/TANK	673581.4523	1682862.2646
703	673777.3420	1683356.4370	4060.94	US/TC-514-FORM/TANK	673582.0671	1682868.5648
704	673759.1130	1683359.4810	4061.06	US/TC-514-FORM/TANK	673563.8434	1682871.6079
705	673757.7990	1683353.3170	4061.32	US/TC-514-FORM/TANK	673562.5298	1682865.4457
706	678061.9490	1684350.2580	4078.63	US/TC-516-FORMTANK	677865.4323	1683862.0978
707	678072.0100	1684348.4740	4078.61	US/TC-516-FORMTANK	677875.4904	1683860.3143
708	678074.0860	1684360.1530	4078.25	US/TC-516-FORMTANK	677877.5658	1683871.9899
709	678065.1290	1684362.4260	4078.47	US/TC-516-FORMTANK	677868.6114	1683874.2622
710	678069.6040	1684359.8850	4078.30	US/TC-516-STATION-1	677873.0851	1683871.7220
711	678064.5960	1684356.9350	4078.34	US/TC-516-STATION-2	677868.0786	1683868.7728
712	678066.1670	1684350.4200	4078.54	US/TC-516-STATION-3	677869.6491	1683862.2597
713	678072.9250	1684354.8490	4078.09	US/TC-516-STATION-4	677876.4052	1683866.6874
714	678101.7280	1684311.2380	4077.72	US/TC-516-MW-2	677905.1998	1683823.0891
715	678116.9250	1684291.3650	4077.78	US/TC-516-MW-2	677920.3924	1683803.2218
716	678061.7680	1684335.2520	4080.38	US/TC-516-BLDGCOR	677865.2514	1683847.0961
717	678064.6310	1684348.2080	4081.07	US/TC-516-BLDGCOR	677868.1136	1683860.0484
718	678026.7560	1684390.7900	4078.49	US/TC-516-MW-1	677830.2495	1683902.6180
719	678014.0050	1684363.8290	4077.81	US/TC-516-MW-3	677817.5022	1683875.6648

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
720	671269.9880	1692357.3370	4075.08	US/TC-508-FORM/TANK	671075.4398	1691866.8562
721	671299.4450	1692330.8640	4075.18	US/TC-508-FORM/TANK	671104.8883	1691840.3908
722	671324.3300	1692358.5130	4075.17	US/TC-508-FORM/TANK	671129.7661	1691868.0318
723	671294.8560	1692384.8580	4075.02	US/TC-508-FORM/TANK	671100.3006	1691894.3692
724	671311.5950	1692346.0080	4075.12	US/TC-508-STATION-2	671117.0347	1691855.5304
725	671302.2680	1692357.1830	4075.07	US/TC-508-STATION-1	671107.7104	1691866.7022
726	671312.4640	1692368.2800	4074.98	US/TC-508-STATION-4	671117.9035	1691877.7960
727	671282.5110	1692369.9060	4075.01	US/TC-508-STATION-3	671087.9592	1691879.4215
728	671289.2400	1692342.4620	4075.15	US/TC-508-STATION-5	671094.6862	1691851.9855
729	671373.3210	1692386.6060	4075.00	US/TC-508-MW-3-PVC	671178.7429	1691896.1167
730	671373.6120	1692386.5000	4075.33	US/TC-508-MW-3-CASIN	671179.0338	1691896.0107
731	671216.9160	1692488.1670	4075.54	US/TC-508-SS18-MW08-CASIN	671022.3832	1691997.6482
732	671216.7110	1692488.4340	4075.26	US/TC-508-SS18-MW08-PVC	671022.1782	1691997.9152
733	671236.3110	1692301.9320	4075.19	US/TC-508-MW-2-CASIN	671041.7726	1691811.4672
734	671236.1240	1692302.1450	4074.80	US/TC-508-MW-2-PVC	671041.5856	1691811.6801
735	671211.3090	1692324.4610	4075.35	US/TC-508-MW-1-CASIN	671016.7778	1691833.9897
736	671211.0360	1692324.6620	4074.93	US/TC-508-MW-1-PVC	671016.5049	1691834.1906
737	671174.1880	1692241.9700	4074.81	US/TC-508-SS18-MW16-PVC	670979.6676	1691751.5226
738	671174.4770	1692241.7880	4075.34	US/TC-508-SS18-MW16-CASIN	670979.9565	1691751.3406
739	671035.8870	1692106.1030	4074.42	US/TC-508-SS18-MW18-CASIN	670841.4066	1691615.6950
740	671035.6230	1692106.3690	4073.74	US/TC-508-SS18-MW18-PVC	670841.1427	1691615.9609
741	671043.1730	1692355.2630	4075.73	US/TC-508-SS18-MW19-PVC	670848.6905	1691864.7828
742	670383.2120	1691278.5670	4072.57	US/TC-504-MW-2-CASIN	670188.9208	1690788.3988
743	670383.0220	1691278.7790	4072.19	US/TC-504-MW-2-PVC	670188.7309	1690788.6107
744	670343.7050	1691297.2270	4072.57	US/TC-504-MW-1-PVC	670149.4253	1690807.0534
745	670343.9460	1691296.8630	4072.80	US/TC-504-MW-1-CASIN	670149.6662	1690806.6895
746	669680.3630	1678704.0610	4048.54	OTC-531A-BLDGCOR	669486.2755	1678217.5372
747	669673.4280	1678699.1340	4048.44	OTC-531A-BLDGCOR	669479.3425	1678212.6116
748	669662.1160	1678671.3190	4048.32	OTC-531A-BLDGCOR	669468.0338	1678184.8047
749	669671.0810	1678657.6480	4048.29	OTC-531A-BLDGCOR	669476.9962	1678171.1376
750	669671.6690	1678686.6260	4048.54	OTC-531A-ELINE	669477.5840	1678200.1072
751	670995.2900	1691723.6540	4072.55	US/TC-500-STATION-6	670800.8214	1691233.3568
752	682707.7150	1693994.3080	4139.12	OTC-539-SEPTIC	682509.8519	1693503.3527
753	682707.1360	1693987.5070	4139.01	OTC-539-SEPTIC	682509.2731	1693496.5537
754	682713.9270	1693987.3840	4139.07	OTC-539-SEPTIC	682516.0621	1693496.4307
755	682714.4020	1693993.8490	4139.12	OTC-539-SEPTIC	682516.5370	1693502.8939
756	682710.5050	1693994.2530	4139.11	OTC-539-ELINE	682512.6411	1693503.2977
757	682711.7750	1694038.3560	4139.83	OTC-539-ELINE	682513.9107	1693547.3880
758	682709.6340	1694009.1330	4139.38	OTC-539-STATION-1	682511.7704	1693518.1734
759	682715.9010	1693990.7160	4139.12	OTC-539-STATION-2	682518.0355	1693499.7618
760	682707.9950	1693985.7400	4139.05	OTC-539-STATION-3	682510.1318	1693494.7872
761	682690.1540	1693966.7430	4138.58	OTC-539-STATION-4	682492.2960	1693475.7957
762	682700.5510	1693984.6270	4139.10	OTC-539-LEACH	682502.6900	1693493.6745
763	682694.7220	1693978.9800	4138.75	OTC-539-LEACH	682496.8627	1693488.0292
764	682685.8570	1693975.5370	4138.62	OTC-539-LEACH	682488.0002	1693484.5872
765	682686.8260	1693963.6500	4138.56	OTC-539-LEACH	682488.9690	1693472.7036
766	682690.9260	1693959.9730	4138.78	OTC-539-LEACH	682493.0678	1693469.0277
767	682696.9840	1693956.9410	4138.94	OTC-539-LEACH	682499.1240	1693465.9966
768	682705.4410	1693958.5980	4139.12	OTC-539-LEACH	682507.5786	1693467.6531
769	682714.7430	1693968.3290	4139.32	OTC-539-LEACH	682516.8779	1693477.3813
770	682721.4010	1693976.8710	4139.30	OTC-539-LEACH	682523.5339	1693485.9208
771	682717.7930	1693983.8070	4139.35	OTC-539-LEACH	682519.9270	1693492.8548
772	682710.1830	1693984.5790	4139.16	OTC-539-FLINE	682512.3192	1693493.6265
773	682710.2190	1693987.2160	4139.18	OTC-539-FLINE	682512.3552	1693496.2628
774	682690.6020	1694039.4720	4139.43	OTC-539-BLDGCOR	682492.7439	1693548.5036
775	682684.8200	1694045.5030	4139.27	OTC-539-BLDGCOR	682486.9635	1693554.5329
776	682741.4000	1694039.0240	4140.22	OTC-539-BLDGCOR	682543.5271	1693548.0558
777	682747.1830	1694045.0970	4140.68	OTC-539-BLDGCOR	682549.3085	1693554.1270

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7824
PROFESSIONAL SURVEYOR

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
778	686068.4560	1686694.7280	4103.68	OTC-534-MW-10-PVC	685869.6189	1686205.8883
779	686068.7800	1686694.7810	4104.06	OTC-534-MW-10-CASING	685869.9428	1686205.9413
780	685846.6180	1686522.2590	4102.52	OTC-534-MW-11-CASING	685647.8452	1686033.4693
781	685846.3620	1686522.2240	4102.15	OTC-534-MW-11-PVC	685647.5893	1686033.4343
782	685670.3280	1686561.9490	4102.29	OTC-534-MW-12-PVC	685471.6063	1686073.1478
783	685670.6410	1686561.9860	4102.69	OTC-534-MW-12-CASING	685471.9192	1686073.1848

RAW DATA

HOLLOMAN AIR FORCE BASE
WEST SITE

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	684793.2210	1611172.5300	3911.93	BASE	684598.9178	1610715.3759
2	682531.9480	1628747.6200	3965.57	EC-30	682338.2864	1628285.4792
3	682452.1330	1628714.0920	3957.20	EC-30-2	682258.4940	1628251.9607
4	698323.2620	1606321.3780	3915.08	CHAS	698125.1198	1605865.6004
5	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
60	616427.1730	1576921.6540	3941.67	LUCERO	616252.2680	1576474.2182
61	600657.7750	1576446.9260	4131.58	GERI	600487.3444	1575999.6249
62	614156.5210	1568701.1170	4227.09	SW 30	613982.2602	1568256.0137
63	575518.1130	1586543.7100	4038.20	BRYCE AZ MK	575354.8155	1586093.5441
64	576512.9440	1582067.6800	4357.70	BRYCE	576349.3642	1581618.7841
65	633185.2600	1566510.7280	4417.64	HORN	633005.6000	1566066.2462
66	580320.9040	1585783.2080	4128.59	NICK 2	580156.2437	1585333.2579
67	682452.1790	1628714.1810	3957.10	EC-30-2	682258.5400	1628252.0496
68	698323.2620	1606321.3780	3914.70	CHAS	698125.1198	1605865.6004
69	698212.0050	1609477.2870	3928.40	CHUCK	698013.8943	1609020.6139
70	682531.9020	1628747.5310	3965.57	EC-30	682338.2404	1628285.3902
71	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
100	684194.1900	1611160.8710	3912.56	USTC-518-NG	684000.0567	1610703.7202
101	684194.8810	1611165.7430	3912.33	USTC-518-NG	684000.7475	1610708.5908
102	684188.7970	1611168.5190	3912.27	USTC-518-NG	683994.6653	1610711.3660
103	684189.4230	1611176.5450	3912.53	USTC-518-NG	683995.2911	1610719.3898
104	684179.6480	1611178.5150	3912.57	USTC-518-NG	683985.5189	1610721.3592
105	684178.1630	1611171.1680	3912.37	USTC-518-NG	683984.0343	1610714.0143
106	684177.1790	1611163.0630	3913.00	USTC-518-NG	683983.0506	1610705.9116
107	684157.6940	1611173.6700	3912.42	USTC-518-STATION-5	683963.5711	1610716.5156
108	684176.2170	1611179.5100	3912.28	USTC-518-STATION-4	683982.0888	1610722.3539
109	684175.8730	1611172.3430	3912.51	USTC-518-STATION-2	683981.7449	1610715.1890
110	684173.8830	1611163.3430	3912.65	USTC-518-STATION-3	683979.7555	1610706.1915
111	684189.5770	1611170.0220	3912.30	USTC-518-STATION-1	683995.4450	1610712.8686
112	684160.3220	1611172.8640	3912.49	USTC-518-POTHOLE-1	683966.1984	1610715.7098
113	684125.1520	1611185.2360	3910.93	USTC-518-MW-1	683931.0383	1610728.0783
114	684130.9190	1611216.0540	3911.17	USTC-518-MW-2	683936.8037	1610758.8876
115	684158.8770	1611187.1610	3912.34	USTC-518-BLDGCORN-70	683964.7538	1610730.0028
116	684163.9700	1611180.4420	3912.46	USTC-518-BLDGCORN-70	683969.8453	1610723.2857
117	684211.6690	1611174.1790	3912.47	USTC-518-BLDGCORN-70	684017.5308	1610717.0244
118	684218.3800	1611179.3060	3912.45	USTC-518-BLDGCORN-70	684024.2399	1610722.1500
119	684236.0190	1611144.8000	3911.88	USTC-518-NAIL	684041.8739	1610687.6538
120	684242.7800	1611133.9130	3911.77	USTC-518-NAIL	684048.6330	1610676.7699
121	684203.7200	1611162.6570	3912.21	USTC-518-STATION-6	684009.5840	1610705.5057

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SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7924
PROFESSIONAL SURVEYOR

Appendix I
Laboratory Analytical Data and Data Validation Checklists

Note: The data validation checklists and laboratory analytical data reports are provided as separate files.

Appendix J
Waste Manifests

HAFB-001

Generator's Name	Generator's Address	Generator's Telephone No.
USAF	550 TABOSA AVE Holloman AFB NM 88330	575-491-8262

Origin of Special Waste (Project or Spill Location): ~~White Sands National Monument Park - Storage Lagoons~~ Holloman AFB NM Bldg # 55

Transporter #1 Company Name	Address	Telephone No.
Southwest Disposal	1350 LaVelle Road	575-434-1109
Transporter #2 Company Name	Address	Telephone No.
	Alamogordo, NM 88310	

Destination Facility Name/Site Address	Facility ID (Permit) Number	Telephone No.
Otero/Greentree Regional Landfill 24 Mls South of Alamogordo, Hwy 54	SWM-109102	575-439-4355

Type and Proper Name of Special Waste	Container(s) No.	Container(s) Type	Total Quantity	Unit Wt/Vol	
Non RCRA/Non Hazardous Substance ~~(Treatment Plant Lagoon Sludge)~~ (soil)		SD		6.95	Tons

Additional Descriptions for Special Waste Listed Above:

Site Contact: Todd Hiltunen 307-214-6080

Special Handling Instructions:

Southwest Disposal - Lined and Covered Roll-off

GENERATOR'S CERTIFICATION I hereby certify that the contents of this shipment are fully and accurately described above by type and proper name of the special waste, and that such waste has been managed, packaged, containerized and labeled in accordance with the requirements of 20.9.8 NMAC (Special Waste Requirements) in addition to any other applicable federal, state or local regulations.

Truck # 553 Bin #

Printed/Typed Name:	Signature:	Date:
Todd Hiltunen for Brent Hunt (CES)	for Brent Hunt (CES)	9/25/12

Transporter 1 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:
David Gurnbach		9/26/12

Transporter 2 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:

Discrepancy Indication Space:

Analytical supplied to landfill

no facility ID number

Facility Owner or Operator: ***I hereby acknowledge receipt of the special waste as indicated upon this manifest, except as noted above in the Discrepancy Indication Space.***

Printed/Typed Name:	Signature:	Date:
Darrell McGinnis / Attendant		9-26-12

~~Facility~~

OTERO/GREENTREE
REGIONAL LANDFILL

TRANSACTION: 28,080

CO. NAME:

ADDRESS: Environmental Waste Solutions
1348 B. Redtail Hawk Drive

CITY & STATE: Boardman, OH 44512

DATE: 9/26/12 TIME: 9:07 am

TRUCK NO.: 198

GROSS WEIGHT 47000

TARE WEIGHT: 33100

NET TONS: 13900 6.95

COST $: [redacted]

5% TAX $:

TOTAL DUE $:

WASTE: 5

WASTE DESC.: Construction Debris
H.A.F.B.

WASTE ORIGIN:

DRIVER

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-075

Appendix K
Geochemical Evaluation

Appendix K
Geochemical Evaluation of Arsenic in Soil at Building 1201 Septic Tank OT-C538, Holloman Air Force Base

This appendix provides the methodology and results of a geochemical evaluation of arsenic concentrations in soil samples from the Building 1201 Septic Tank OT-C538 location, Holloman Air Force Base.

Eleven of the soil samples considered in this evaluation ("site" samples) were obtained on June 29, 2012 at several depth intervals ranging from 0.0 to 2.0 feet (ft) to 25.0 to 27.0 ft below ground surface (bgs). These samples were analyzed for the full suite of 23 Target Analyte List metals. An additional confirmatory sample (Field ID: OTC538-IS-0012-062912) was obtained at OTC538-Station 4 (OTC538-MW01) on November 6, 2012 that was only analyzed for arsenic and iron.

Arsenic is evaluated here because the New Mexico Environment Department (NMED) soil screening level (SSL) of 3.9 milligrams per kilogram (mg/kg) for arsenic was exceeded in sample OTC538-IS-0011-062912 (25.0 to 27.0 ft bgs) at OTC538-Station 4 (OTC538-MW01) which had a concentration of 19.2 mg/kg. A confirmatory sample (OTC538-IS-0012-062912) from the same location obtained on November 6, 2012 had an arsenic concentration of 8.1 mg/kg, which also exceeded the SSL.

Analyses of 42 background subsurface samples were used for comparison in the evaluation. These background samples were obtained from depths of 7.0 to 30.0 ft bgs at intervals that were above the water table. Descriptions of the background samples can be found in Nation View-Bhate (2009).

Evaluation Methodology

Trace element distributions in soil are often right-skewed and can span a wide range of concentrations. Trace element concentrations can naturally exceed risk-based screening levels because these screening levels do not consider natural site-specific distributions of trace element concentrations.

Comparisons of concentrations in site samples to background screening values can also be problematic. The background screening values used here are based on the 95th upper tolerance limits of background distributions. By definition, one would expect that five percent, or one in 20 samples will on average exceed the background screening value even if no contamination is present.

Comparisons to risk-based screening levels and background screening values only consider the absolute concentrations of individual elements, and disregard the interdependence of element concentrations and the geochemical mechanisms controlling element behavior. However, it is well established that trace elements naturally associate with specific minerals in soil and sediment, and the preferential enrichment of a sample with these minerals will result in naturally elevated trace element concentrations. It is thus important to be able to identify these naturally high concentrations and distinguish them from potential contamination.

Recent publications indicate that geochemical evaluations are assuming a larger role in environmental investigations (e.g., EPA, 1995; Barclift, *et al*., 2000; U.S. Navy, 2002, 2003; Myers and Thorbjornsen, 2004; Thorbjornsen and Myers, 2007a, 2007b, 2008). A properly executed geochemical evaluation can distinguish between naturally high element concentrations versus contamination, and can identify the specific samples that may contain some component of site-related contamination.

Geochemical Evaluation Methodology for Soil. Trace elements naturally associate with specific soil-forming minerals, and geochemical evaluations are predicated on these known associations. For example, in most uncontaminated oxic soils, arsenic exhibits an association with iron oxide minerals. Arsenic exists in oxic soil pore fluid as oxyanions such as $HAsO_4^{-2}$ and $H_2AsO_4^{-}$ (Brookins, 1988), and these negatively charged species have a strong affinity to adsorb on iron oxides, which tend to maintain a net positive surface charge (Electric Power Research Institute, 1984). (In this report, the term “iron oxide” encompasses oxides, hydroxides, oxyhydroxides, and hydrous oxides of iron.) This association is expressed as a positive correlation between arsenic concentrations and iron concentrations for uncontaminated samples.

As a result of these associations, soil samples with a low percentage of iron oxides will contain proportionally lower arsenic concentrations, and soil samples that are enriched in iron oxides will contain proportionally higher arsenic concentrations (Bowell, 1994).

Although there is variability in the absolute concentrations of arsenic and iron in soil at a site, the arsenic/ion (As/Fe) ratios of the samples will be relatively constant if no contamination is present (Myers and Thorbjornsen, 2004). Samples that contain excess arsenic from a contaminant source (herbicides, treated wood, etc.) will exhibit anomalously high As/Fe ratios compared to the uncontaminated samples.

The reference elements against which trace elements are evaluated reflect the affinities that the trace elements have for specific minerals, which is a function of the specific geochemical environment. The concentrations of iron and aluminum serve as qualitative indicators of the amounts of iron oxide and clay minerals that are present in the soil samples (all clay minerals contain aluminum as a major component). Along with arsenic, selenium and vanadium are present in oxic soil pore fluid as anions and have an affinity to adsorb on iron oxides, which tend to maintain a net positive surface charge. Concentrations of arsenic, selenium, or vanadium in a set of samples can be evaluated through comparison to the corresponding iron concentrations. Barium, cobalt, cadmium, lead, and zinc are typically present in soil as divalent cations and have an affinity to adsorb on clay minerals, which tend to maintain a net negative surface charge. Concentrations of these elements can be evaluated through comparison to the corresponding aluminum concentrations.

To perform the geochemical evaluation, correlation plots are constructed to explore the elemental associations and identify potentially contaminated samples. The detected concentrations of the trace element of interest (dependent variable) are plotted against the detected concentrations of the reference element (independent variable), which represents the mineral to which the trace element may be adsorbed. In the case of arsenic, the arsenic concentrations for a given set of samples would be plotted on the y-axis and the corresponding iron concentrations would be plotted on the x-axis.

If no contamination is present, then the samples will exhibit a common trend with a positive slope, and the samples with the highest trace element concentrations will fall on this trend. This indicates that the elevated trace element concentrations are due to the preferential enrichment of the minerals represented by the reference element concentrations in those samples, and that the trace element has a natural source. If, however, the samples with high trace element concentrations have low or moderate reference element concentrations, then those samples will lie above the trend established by the other samples. This indicates that the anomalous samples contain excess trace

elements beyond that which can be explained by the natural reference element content, and such samples may contain a component of contamination.

Site samples with a trace element present as a contaminant will exhibit anomalously high trace-versus-major element ratios compared to background trace-versus-major element ratios. These elevated ratios may not always be apparent in log-log correlation plots, especially at the upper end of the concentration range. Therefore, ratio plots—which depict trace element concentrations on the y-axis and trace/reference element ratios on the x-axis—are employed in conjunction with correlation plots in those cases where it is not immediately apparent which site samples have anomalously high elemental ratios on the correlation plots. Ratio plots have high resolution over the entire concentration range and permit easy visual identification of samples with anomalously high elemental ratios relative to background.

It is important to note that there is natural variability, as well as analytical uncertainty, in the element ratios of uncontaminated soil samples. Trace/reference element ratios are calculated from two uncertain analytical results, so the resulting uncertainties in the ratios can produce some scatter in the points on a ratio plot. This is especially true when estimated ("J"-qualified) analytical results are used. This can be seen on some of the plots that show more scatter of the points at the lower end of the concentration range, where analytical uncertainties are higher and analytical results are reported with fewer significant figures.

Evaluation Results

Aluminum and iron are evaluated first to determine if the iron concentrations are natural and that they are therefore suitable for use as a reference element for the evaluation of arsenic.

Aluminum and Iron – Aluminum has a mean concentration of 5,500 mg/kg in the 11 site samples. Aluminum is a primary component of common soil-forming minerals such as clays, feldspars, and micas. Aluminum is always trivalent (as Al^{3+}) and can substitute for ferric iron (Fe^{3+}) in iron oxide minerals. It can also adsorb on iron oxide surfaces (Cornell and Schwertmann, 2003).

Iron has a mean concentration of 6,000 mg/kg in the site samples, and is dominantly present as iron oxides. Iron oxides are common soil-forming minerals and occur as

discrete mineral grains or as coatings on silicate minerals (Cornell and Schwertmann, 2003).

Clays and iron oxides tend to exist as very fine particles, so both aluminum (a proxy for clay content) and iron (a proxy for iron oxide content) are enriched in samples with finer grain sizes. A plot of iron versus aluminum concentrations can be used to qualitatively assess the relative abundance of these minerals in site soil, as shown in Figure 1. The 11 site samples are represented by circles, and the 42 subsurface background soil samples are represented by triangles in the figure. The background samples and most of the site samples fall on the same trend in the plot, indicating that these samples have similar iron/aluminum (Fe/Al) ratios. The one exception is soil sample OTC538-IS-0011-062912 which falls above the trend established by the other samples. The confirmatory sample OTC538-IS-0012-062912 from the same location could not be shown on Figure 1 because it was not analyzed for aluminum.

These Fe/Al ratios can be seen more clearly on Figure 2, which shows iron concentrations versus Fe/Al ratios for each sample. The background samples and most of the site samples have ratios that fall well within one order of magnitude, indicating that these samples do not contain excess aluminum or iron from a contaminant source and that their aluminum and iron concentrations are natural. Sample OTC538-IS-0011-062912, which fell above the trend in Figure 1, appears to the right of the vertical stack of points, confirming that this sample has an anomalously high Fe/Al ratio. A possible explanation for this anomaly is a component of iron contamination in this sample.

Arsenic – Arsenic is known to associate with iron oxide minerals as discussed above. A soil sample that is naturally enriched in iron oxides is expected to be naturally enriched in arsenic. Figure 3 provides a plot of detected arsenic versus iron concentrations in the site and background samples. Most of the site samples and background samples fall on the same trend, although this trend is less correlated than the iron versus aluminum trend shown in Figure 1. Three of the 12 site samples have nondetectable arsenic (as does ten of the 47 background samples), and seven of the 12 site samples have estimated ("J"-flagged) results that are below their reporting limits (RL). Estimated results usually show less correlation on the plots because the true locations of the points are uncertain.

The two samples with the highest arsenic are soil sample OTC538-IS-0011-062912 (which had the high Fe/Al ratio) and its confirmation sample OTC538-IS-0012-062912.

Both of these samples appear to have more arsenic than can be explained by the iron content.

Figure 4 provides a ratio plot of the same arsenic and iron results. This perspective reveals that the two site samples that fell above the trend in Figure 3 have elevated As/Fe ratios relative to the other site samples. There are three background samples with similarly high As/Fe ratios, but these samples have low estimated ("J"-flagged) arsenic and iron concentrations so their ratios are uncertain.

The high arsenic concentrations and high As/Fe ratios in sample OTC538-IS-0011-062912 and its confirmation sample OTC538-IS-0012-062912 may contain a component of arsenic contamination.

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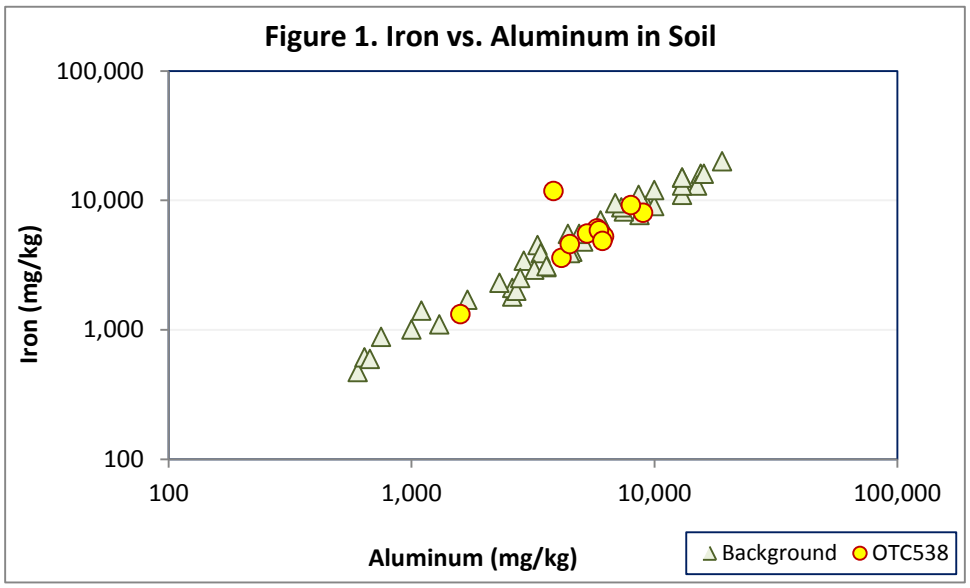
Figure 1. Iron vs. Aluminum in Soil
100,000
10,000
1,000
100
Iron (mg/kg)
100
1,000
10,000
100,000
Aluminum (mg/kg)
Background
OTC538

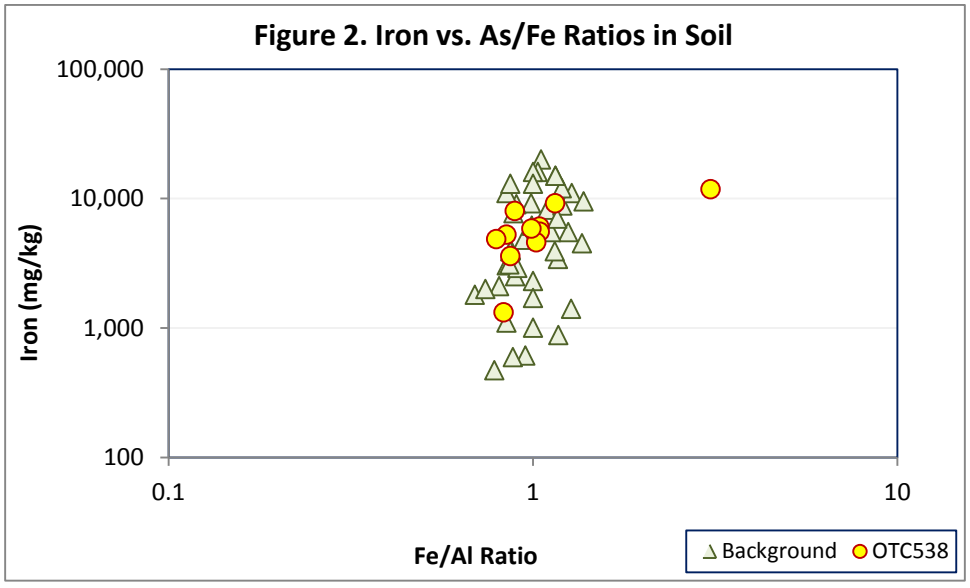
Figure 2. Iron vs. As/Fe Ratios in Soil
100,000
10,000
1,000
100
Iron (mg/kg)
0.1
1
10
Fe/Al Ratio
Background
OTC538

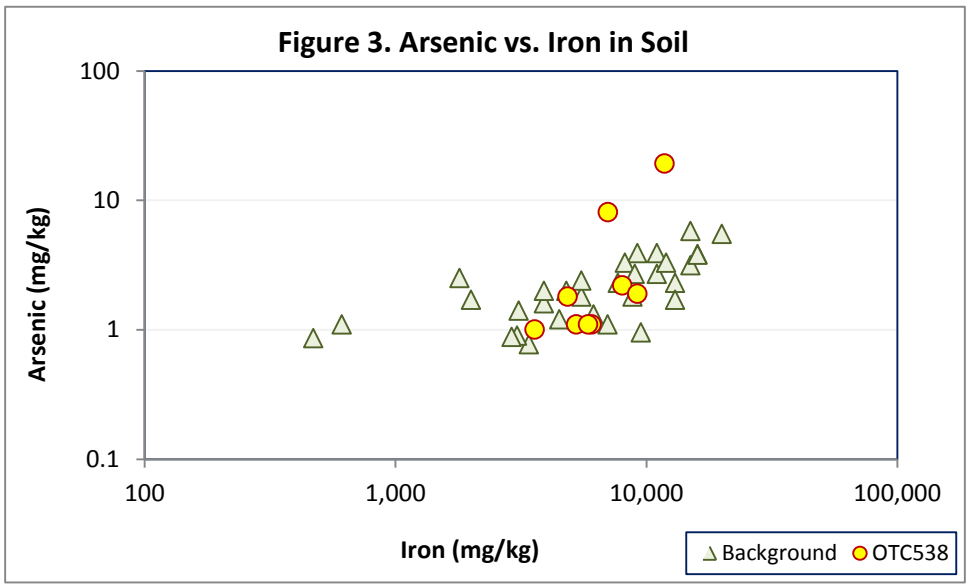
Figure 3. Arsenic vs. Iron in Soil
100
10
1
0.1
Arsenic (mg/kg)
100
1,000
10,000
100,000
Iron (mg/kg)
Background
OTC538

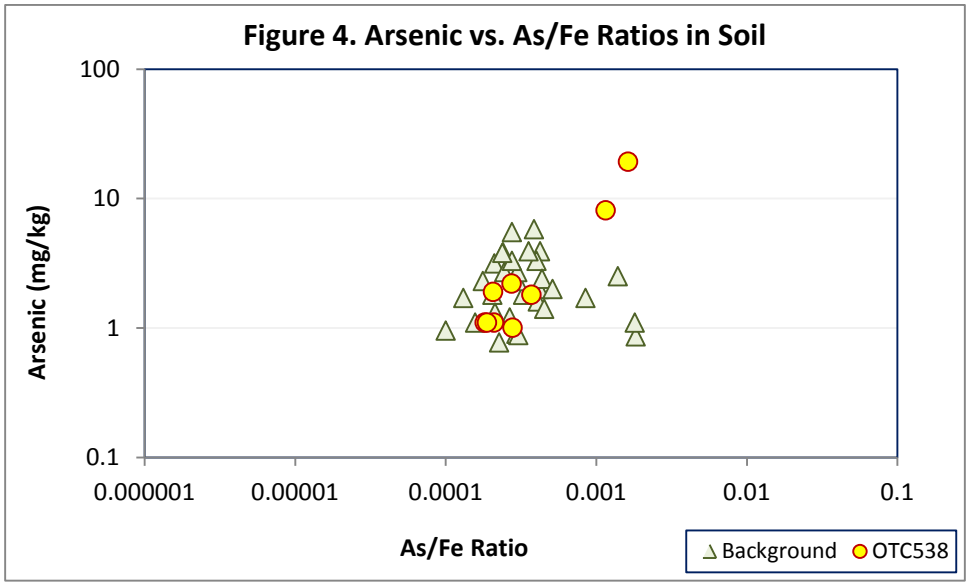
Figure 4. Arsenic vs. As/Fe Ratios in Soil
100
10
1
0.1
Arsenic (mg/kg)
0.000001
0.00001
0.0001
0.001
0.01
0.1
As/Fe Ratio
Background
OTC538

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-075

Appendix L
Risk Evaluation Calculations

Risk Addtivity
Soil Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC538-IS-0001-062912		OTC538-IS-0002-062912		OTC538-IS-0003-062912-FD		OTC538-IS-0004-062912		OTC538-IS-0005-062912		OTC538-IS-0006-062912		OTC538-IS-0007-062912		OTC538-IS-0008-062912		OTC538-IS-0009-062912		OTC538-IS-0010-062912	
				Sample Date	6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location	STA 1		STA 1		STA 1		STA 2		STA 2		STA 3		STA 3		MW-01 (STA 4)		MW-01 (STA 4)		MW-01 (STA 4)	
				Depth (ft bgs)	3 - 5		10 - 12		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**82.2**		**88.1**		**88.3**		**90.4**		**89.1**		**87.7**		**89.5**		**87.1**		**88.4**		**88.6**	
VOLATILES (mg/kg)																								
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0011	U	0.0011	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00099	U	0.0011	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0012	U	0.0012	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0017	U	0.0017	U	0.0016	U	0.0018	U	0.0017	U	0.0018	U	0.0017	U	0.0018	U	0.0015	U	0.0016	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0011	U	0.0011	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00099	U	0.0011	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0011	U	0.0011	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00099	U	0.0011	U
1,1-DICHLOROETHENE	NE	240	449		0.0014	U	0.0014	U	0.0013	U	0.0015	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0013	U	0.0014	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0012	U	0.0012	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0023	U	0.0023	U	0.0022	U	0.0024	U	0.0023	U	0.0025	U	0.0023	U	0.0024	U	0.0021	U	0.0022	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.00099	U	0.001	U	0.00095	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.0009	U	0.00096	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0011	U	0.0011	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00099	U	0.0011	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.00099	U	0.001	U	0.00095	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.0009	U	0.00096	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0012	U	0.0012	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0012	U	0.0012	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0011	U	0.0011	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00099	U	0.0011	U
2-HEXANONE	NE	210	NE		0.0054	U	0.0055	U	0.0051	U	0.0057	U	0.0054	U	0.0058	U	0.0054	U	0.0056	U	0.0048	U	0.0052	U
ACETONE	NE	61000	66600		0.02	U	0.02	U	0.019	U	0.021	U	0.02	U	0.022	U	0.02	U	0.021	U	0.018	U	0.019	U
BENZENE	NE	1.1	15.4		0.0015	U	0.0015	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U	0.0014	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0011	U	0.0011	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00099	U	0.0011	U
BROMOFORM	NE	62	616		0.0015	U	0.0015	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U	0.0014	U
BROMOMETHANE	NE	7.3	16.5		0.002	U	0.002	U	0.0019	U	0.0021	U	0.002	U	0.0022	U	0.002	U	0.0021	U	0.0018	U	0.0019	U
CARBON DISULFIDE	NE	820	1530		0.002	U	0.002	U	0.0019	U	0.0021	U	0.002	U	0.0022	U	0.002	U	0.0021	U	0.0018	U	0.0019	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0018	U	0.0018	U	0.0017	U	0.0019	U	0.0018	U	0.0019	U	0.0018	U	0.0019	U	0.0016	U	0.0017	U
CHLOROBENZENE	NE	290	376		0.00099	U	0.001	U	0.00095	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.0009	U	0.00096	U
CHLOROETHANE	NE	15000	29800		0.002	U	0.002	U	0.0019	U	0.0021	U	0.002	U	0.0022	U	0.002	U	0.0021	U	0.0018	U	0.0019	U
CHLOROFORM	NE	0.29	5.86		0.0012	U	0.0012	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U
CHLOROMETHANE	NE	120	275		0.002	U	0.002	U	0.0019	U	0.0021	U	0.002	U	0.0022	U	0.002	U	0.0021	U	0.0018	U	0.0019	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0015	U	0.0015	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U	0.0014	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.00099	U	0.001	U	0.00095	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.0009	U	0.00096	U
CYCLOHEXANE	NE	7000	NE		0.0014	U	0.0014	U	0.0013	U	0.0015	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0013	U	0.0014	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.00099	U	0.001	U	0.00095	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.0009	U	0.00096	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0015	U	0.0015	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U	0.0014	U
ETHYLBENZENE	NE	5.4	68.4		0.00099	U	0.001	U	0.00095	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.0009	U	0.00096	U
ISOPROPYLBENZENE	NE	2100	2430		0.0011	U	0.0011	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00099	U	0.0011	U
METHYL ACETATE	NE	78000	78200		0.012	U	0.013	U	0.012	U	0.013	U	0.012	U	0.013	U	0.012	U	0.013	U	0.011	U	0.012	U
METHYL ETHYL KETONE	NE	28000	37100		0.0061	U	0.0062	U	0.0058	U	0.0065	U	0.0061	U	0.0066	U	0.0061	U	0.0063	U	0.0055	U	0.0059	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0055	U	0.0056	U	0.0052	U	0.0058	U	0.0055	U	0.0059	U	0.0055	U	0.0057	U	0.0049	U	0.0053	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0013	U	0.0013	U	0.0012	U	0.0014	U	0.0013	U	0.0014	U	0.0013	U	0.0013	U	0.0012	U	0.0013	U
METHYLENE CHLORIDE	NE	56	409		0.0046	U	0.0047	U	0.0044	U	0.0049	U	0.0046	U	0.005	U	0.0046	U	0.0047	U	0.0041	U	0.0044	U

Risk Addtivity
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				Sample Date	6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location	STA 1		STA 1		STA 1		STA 2		STA 2		STA 3		STA 3		MW-01 (STA 4)		MW-01 (STA 4)		MW-01 (STA 4)	
				Depth (ft bgs)	3 - 5		10 - 12		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																								
STYRENE	NE	6300	7280		0.0026	U	0.0026	U	0.0025	U	0.0028	U	0.0026	U	0.0028	U	0.0026	U	0.0027	U	0.0023	U	0.0025	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.002	U	0.002	U	0.0019	U	0.0021	U	0.002	U	0.0022	U	0.002	U	0.0021	U	0.0018	U	0.0019	U
TETRACHLOROETHYLENE	NE	22	7.02		0.00099	U	0.001	U	0.00095	U	0.0011	U	0.001	U	0.0011	U	0.001	U	0.001	U	0.0009	U	0.00096	U
TOLUENE	NE	5000	5270		0.0012	U	0.0012	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0015	U	0.0015	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U	0.0014	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0011	U	0.0011	U	0.001	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.0011	U	0.00099	U	0.0011	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0012	U	0.0012	U	0.0011	U	0.0013	U	0.0012	U	0.0013	U	0.0012	U	0.0012	U	0.0011	U	0.0012	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.002	U	0.002	U	0.0019	U	0.0021	U	0.002	U	0.0022	U	0.002	U	0.0021	U	0.0018	U	0.0019	U
VINYL CHLORIDE	NE	0.06	0.728		0.0015	U	0.0015	U	0.0014	U	0.0016	U	0.0015	U	0.0016	U	0.0015	U	0.0015	U	0.0013	U	0.0014	U
XYLENES, TOTAL	NE	630	814		0.0032	U	0.0032	U	0.003	U	0.0034	U	0.0032	U	0.0034	U	0.0032	U	0.0033	U	0.0029	U	0.0031	U
SEMIVOLATILES (mg/kg)																								
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
2,4-DICHLOROPHENOL	NE	180	183		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.025	U	0.024	U	0.024	U	0.023	U	0.023	U	0.024	U	0.023	U	0.024	U	0.023	U	0.024	U
2,4-DINITROPHENOL	NE	120	122		0.4	U	0.38	U	0.37	U	0.37	U	0.37	U	0.38	U	0.37	U	0.39	U	0.37	U	0.38	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
2,6-DINITROTOLUENE	NE	61	61.1		0.024	U	0.022	U	0.022	U	0.022	U	0.022	U	0.022	U	0.022	U	0.023	U	0.022	U	0.022	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
2-CHLOROPHENOL	NE	390	391		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
2-METHYLNAPHTHALENE	NE	230	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
2-METHYLPHENOL	NE	3100	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
2-NITROANILINE	NE	610	NE		0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
2-NITROPHENOL	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
3-NITROANILINE	NE	NE	NE		0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.08	U	0.075	U	0.075	U	0.074	U	0.074	U	0.076	U	0.074	U	0.077	U	0.074	U	0.076	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
4-CHLOROANILINE	NE	2.4	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
4-NITROANILINE	NE	24	NE		0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
4-NITROPHENOL	NE	NE	NE		0.16	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U	0.15	U
ACENAPHTHENE	NE	3400	3440		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
ACENAPHTHYLENE	NE	NE	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
ACETOPHENONE	NE	7800	7820		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
ANTHRACENE	NE	17000	17200		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
ATRAZINE	NE	2.1	NE		0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U

Risk Addtivity
Soil Analytical Data
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Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC538-IS-0001-062912		OTC538-IS-0002-062912		OTC538-IS-0003-062912-FD		OTC538-IS-0004-062912		OTC538-IS-0005-062912		OTC538-IS-0006-062912		OTC538-IS-0007-062912		OTC538-IS-0008-062912		OTC538-IS-0009-062912		OTC538-IS-0010-062912	
				Sample Date	6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location	STA 1		STA 1		STA 1		STA 2		STA 2		STA 3		STA 3		MW-01 (STA 4)		MW-01 (STA 4)		MW-01 (STA 4)	
				Depth (ft bgs)	3 - 5		10 - 12		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																								
BENZALDEHYDE	NE	7800	NE	0.2	U	0.19	U	0.19	U	0.18	U	0.18	U	0.19	U	0.19	U	0.19	U	0.19	U	0.19	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZO(A)PYRENE	NE	0.015	0.148	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
BIPHENYL	NE	51	57.1	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.08	U	0.075	U	0.075	U	0.074	U	0.074	U	0.076	U	0.074	U	0.077	U	0.074	U	0.076	U
CAPROLACTAM	NE	31000	NE	0.064	U	0.06	U	0.06	U	0.059	U	0.059	U	0.061	U	0.059	U	0.062	U	0.06	U	0.061	U
CARBAZOLE	NE	NE	NE	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
CHRYSENE	NE	15	148	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
DIBENZOFURAN	NE	78	NE	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
DIETHYL PHTHALATE	NE	49000	48900	0.08	U	0.075	U	0.075	U	0.074	U	0.074	U	0.076	U	0.074	U	0.077	U	0.074	U	0.076	U
DIMETHYL PHTHALATE	NE	611000	611000	0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.08	U	0.075	U	0.075	U	0.074	U	0.074	U	0.076	U	0.074	U	0.077	U	0.074	U	0.076	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
FLUORANTHENE	NE	2300	2290	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
FLUORENE	NE	2300	2290	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.088	U	0.083	U	0.082	U	0.081	U	0.081	U	0.084	U	0.082	U	0.085	U	0.082	U	0.084	U
HEXACHLOROETHANE	NE	12	42.8	0.04	U	0.038	U	0.037	U	0.037	U	0.037	U	0.038	U	0.037	U	0.039	U	0.037	U	0.038	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
ISOPHORONE	NE	510	5120	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
M,P-CRESOL	NE	NE	NE	0.029	U	0.027	U	0.027	U	0.027	U	0.027	U	0.027	U	0.027	U	0.028	U	0.027	U	0.027	U
NAPHTHALENE	NE	3.6	43.0	0.032	U	0.03	U	0.03	U	0.029	U	0.03	U	0.03	U	0.03	U	0.031	U	0.03	U	0.03	U
NITROBENZENE	NE	4.8	53.5	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.24	U	0.23	U	0.22	U	0.22	U	0.22	U	0.23	U	0.22	U	0.23	U	0.22	U	0.23	U
PHENANTHRENE	NE	1830	1830	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
PHENOL	NE	18000	18300	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U
PYRENE	NE	1700	1720	0.02	U	0.019	U	0.019	U	0.018	U	0.018	U	0.019	U	0.019	U	0.019	U	0.019	U	0.019	U

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				Sample Date		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location		STA 1		STA 1		STA 1		STA 2		STA 2		STA 3		STA 3		MW-01 (STA 4)		MW-01 (STA 4)		MW-01 (STA 4)	
				Depth (ft bgs)		3 - 5		10 - 12		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																									
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U		
1,3-DINITROBENZENE	NE	6.10	NE	0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U		
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U		
2,4-DINITROTOLUENE	NE	1.60	15.7	0.089	U	0.09	U	0.091	U	0.085	U	0.082	U	0.078	U	0.088	U	0.096	U	0.085	U	0.079	U		
2,6-DINITROTOLUENE	NE	61.0	61.1	0.08	U	0.081	U	0.082	U	0.076	U	0.073	U	0.07	U	0.079	U	0.086	U	0.077	U	0.071	U		
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U		
2-NITROTOLUENE	NE	2.90	29.1	0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U		
3-NITROTOLUENE	NE	6.10	7.82	0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U		
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U		
4-NITROTOLUENE	NE	30.0	244.4	0.093	U	0.094	U	0.095	U	0.089	U	0.085	U	0.081	U	0.092	U	0.1	U	0.089	U	0.082	U		
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U		
NITROBENZENE	NE	4.80	53.5	0.086	U	0.086	U	0.087	U	0.082	U	0.078	U	0.075	U	0.085	U	0.092	U	0.082	U	0.076	U		
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U		
TETRYL	NE	240.0	244.0	0.074	U	0.074	U	0.075	U	0.07	U	0.068	U	0.065	U	0.073	U	0.079	U	0.07	U	0.065	U		
PCBS (mg/kg)																									
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0081	U	0.0074	U	0.0075	U	0.0073	UJ	0.0075	U	0.0076	U	0.0074	U	0.0077	U	0.0074	U	0.0075	U		
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.01	U	0.0093	U	0.0094	U	0.0091	U	0.0094	U	0.0094	U	0.0092	U	0.0096	U	0.0093	U	0.0094	U		
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.01	U	0.0093	U	0.0094	U	0.0091	U	0.0094	U	0.0094	U	0.0092	U	0.0096	U	0.0093	U	0.0094	U		
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0081	U	0.0074	U	0.0075	U	0.0073	U	0.0075	U	0.0076	U	0.0074	U	0.0077	U	0.0074	U	0.0075	U		
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0081	U	0.0074	U	0.0075	U	0.0073	U	0.0075	U	0.0076	U	0.0074	U	0.0077	U	0.0074	U	0.0075	U		
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0081	U	0.0074	U	0.0075	U	0.0073	U	0.0075	U	0.0076	U	0.0074	U	0.0077	U	0.0074	U	0.0075	U		
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0081	U	0.0074	U	0.0075	U	0.0073	UJ	0.0075	U	0.0076	U	0.0074	U	0.0077	U	0.0074	U	0.0075	U		
METALS (mg/kg)																									
ALUMINUM	13722	77000	78000	1590		5810		5290		8990		8000		4140		4480		6200		5910		6110			
ANTIMONY	1.6	31	31.3	1.9	U	0.83	U	0.97	U	0.7	U	1.5	U	0.82	U	0.89	U	1.1	U	0.79	U	0.95	U		
ARSENIC	3.7	0.39	3.90	0.97	U	1.1	J	0.97	U	2.2	J	1.9	J	1	J	0.89	U	1.1	J	1.1	J	1.8	J		
BARIUM	169.3	15000	15600	21.2	J	44.7	J	41.2	J	71.9		87.1		33.4	J	36.4	J	54.5	J	47.6	J	108			
BERYLLIUM	1.6	160	156	0.48	U	0.42	U	0.48	U	0.41	J	0.5	J	0.41	U	0.44	U	0.55	U	0.39	U	0.47	U		
CADMIUM	0.3	70	70.3	0.97	U	0.42	U	0.48	U	0.35	U	0.76	U	0.41	U	0.44	U	0.55	U	0.39	U	0.47	U		
CALCIUM	317332	NE	NE	258000		206000		190000		169000		192000		171000		155000		234000		179000		181000			
CHROMIUM[d]	25	117000	117000	1.3	J	6.5		5.9		8.2		10.2		3.7	J	5		5.4	J	6.4		4.8			
COBALT	7.7	23	NE	1.1	J	2.2	J	1.9	J	3	J	3.1	J	1.4	J	1.6	J	1.9	J	1.9	J	1.8	J		
COPPER	13	3100	3130	1.2	J	3.3	J	3.2	J	7.4	J	5.9	J	3	J	2.7	J	3.3	J	3.3	J	4.1	J		
IRON	23049	55000	54800	1320		6050		5520		8010		9200		3590		4570		5250		5850		4850			
LEAD	10.9	400	400	0.97	U	3	J	2.6	J	80.4		5.3	J	2.3	J	4.5	J	2.3	J	2.9	J	2.9	J		
MAGNESIUM	16991	NE	NE	2940		3150		2810		5820		4400		2790		2110	J	1950	J	2950		2500			
MANGANESE	393	1800	1860	29.1		79.6		73.3		187		208		84.9		76.2		108		94.2		76.3			
MERCURY	0.0108	10	15.6	0.0095	U	0.0087	U	0.009	U	0.0086	U	0.0086	U	0.0089	U	0.0087	U	0.0088	U	0.0091	U	0.009	U		
NICKEL	17.4	1500	1560	1.8	J	4.9	J	4.3	J	6.6	J	8.5	J	3.3	J	3.9	J	4.4	J	4.8	J	4.2	J		
POTASSIUM	5077	NE	NE	450	J	1390	J	1280	J	2290	J	1540	J	1040	J	983	J	1440	J	1300	J	1270	J		

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				Sample Date		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location		STA 1		STA 1		STA 1		STA 2		STA 2		STA 3		STA 3		MW-01 (STA 4)		MW-01 (STA 4)		MW-01 (STA 4)	
				Depth (ft bgs)		3 - 5		10 - 12		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
METALS (mg/kg)																									
SELENIUM	1.4	390	391	3.9	U	1.7	U	1.9	U	1.4	U	3.1	U	1.6	U	1.8	U	2.2	U	1.6	U	1.9	U		
SILVER	1.1	390	391	0.48	U	0.42	U	0.48	U	0.35	U	0.38	U	0.41	U	0.44	U	0.55	U	0.39	U	0.47	U		
SODIUM	5196	NE	NE	1020	J	962	J	956	J	390	U	420	U	454	J	490	U	600	U	460	J	747	J		
THALLIUM	1.3	0.78	0.782	2.5	U	1.1	U	1.3	U	0.92	U	2	U	1.1	U	1.2	U	1.4	U	1	U	1.2	U		
VANADIUM	42.6	390	391	6.6	J	11.1	J	10.2	J	14.3	J	18.1	J	7.6	J	8.2	J	12.5	J	10.1	J	10.3	J		
ZINC	54.6	23000	23500	4.8	U	17.2		14		42.7		22.9		11.8		12.7		16.8		15.4		14.2			
PETROLEUM HYDROCARBONS (mg/kg)																									
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	3.1	U	3.1	U	3	U	2.9	U	2.6	U	2.9	U	2.6	U	3.2	U	2.9	U	2.7	U		
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	4.1	U	3.8	U	3.8	U	3.7	U	3.7	U	3.8	U	3.7	U	3.8	U	3.7	U	3.7	U		
OIL RANGE ORGANICS C28-C40	NE	NE	1000	4.1	U	3.8	U	3.8	U	8.39	J	3.7	U	3.8	U	3.7	U	3.8	U	3.7	U	3.7	U		
CYANIDE (mg/kg)																									
CYANIDE	NE	22.0	46.9	0.073	U	0.068	U	0.067	U	0.066	U	0.065	U	0.067	U	0.064	U	0.068	U	0.064	U	0.064	U		
TRITIUM (pCi/g)																									
TRITIUM	NE	NE	NE	4.88	U	4.77	U	4.78	U	4.79	U	4.94	U	4.86	U	4.88	U	4.81	U	4.68	U	4.84	U		

Risk Addtivity
Soil Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC538-IS-0011-062912		OTC538-IS-0012-110612	
				Sample Date		6/29/2012		11/6/2012	
				Location		MW-01 (STA 4)		MW-01 (STA 4) Confirmation	
				Depth (ft bgs)		25 - 27		25 - 27	
				Result	VQ	Result	VQ		
PERCENT SOLIDS	NE	NE	NE	**86.3**		**89.9**			
VOLATILES (mg/kg)									
1,1,1-TRICHLOROETHANE	NE	8700	15600	0.00095	U	NA			
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02	0.001	U	NA			
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100	0.0015	U	NA			
1,1,2-TRICHLOROETHANE	NE	1.1	2.81	0.00095	U	NA			
1,1-DICHLOROETHANE	NE	3.3	64.5	0.00095	U	NA			
1,1-DICHLOROETHENE	NE	240	449	0.0012	U	NA			
1,2,4-TRICHLOROBENZENE	NE	22	73.0	0.001	U	NA			
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86	0.002	U	NA			
1,2-DIBROMOETHANE	NE	0.034	0.588	0.00086	U	NA			
1,2-DICHLOROBENZENE	NE	1900	2310	0.00095	U	NA			
1,2-DICHLOROETHANE	NE	0.43	7.89	0.00086	U	NA			
1,2-DICHLOROPROPANE	NE	0.94	15.2	0.001	U	NA			
1,3-DICHLOROBENZENE	NE	NE	NE	0.001	U	NA			
1,4-DICHLOROBENZENE	NE	2.4	31.7	0.00095	U	NA			
2-HEXANONE	NE	210	NE	0.0046	U	NA			
ACETONE	NE	61000	66600	0.017	U	NA			
BENZENE	NE	1.1	15.4	0.0013	U	NA			
BROMODICHLOROMETHANE	NE	0.27	5.41	0.00095	U	NA			
BROMOFORM	NE	62	616	0.0013	U	NA			
BROMOMETHANE	NE	7.3	16.5	0.0017	U	NA			
CARBON DISULFIDE	NE	820	1530	0.0017	U	NA			
CARBON TETRACHLORIDE	NE	0.61	10.8	0.0015	U	NA			
CHLOROBENZENE	NE	290	376	0.00086	U	NA			
CHLOROETHANE	NE	15000	29800	0.0017	U	NA			
CHLOROFORM	NE	0.29	5.86	0.001	U	NA			
CHLOROMETHANE	NE	120	275	0.0017	U	NA			
CIS-1,2-DICHLOROETHYLENE	NE	160	156	0.0013	U	NA			
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	0.00086	U	NA			
CYCLOHEXANE	NE	7000	NE	0.0012	U	NA			
DIBROMOCHLOROMETHANE	NE	0.68	12.1	0.00086	U	NA			
DICHLORODIFLUOROMETHANE	NE	94	168	0.0013	U	NA			
ETHYLBENZENE	NE	5.4	68.4	0.00086	U	NA			
ISOPROPYLBENZENE	NE	2100	2430	0.00095	U	NA			
METHYL ACETATE	NE	78000	78200	0.011	U	NA			
METHYL ETHYL KETONE	NE	28000	37100	0.0052	U	NA			
METHYL ISOBUTYL KETONE	NE	5300	5820	0.0047	U	NA			
METHYLCYCLOHEXANE	NE	5630	5630	0.0011	U	NA			
METHYLENE CHLORIDE	NE	56	409	0.004	U	NA			

Risk Additivity Evaluation at Building 1201, Holloman AFB

Analyte	C / N	0-10 ft bgs Max Hit (mg/kg)	Cancer Risk	NC ratio
1,1,1-TRICHLOROETHANE		ND		
1,1,2,2-TETRACHLOROETHANE		ND		
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND		
1,1,2-TRICHLOROETHANE		ND		
1,1-DICHLOROETHANE		ND		
1,1-DICHLOROETHENE		ND		
1,2,4-TRICHLOROBENZENE		ND		
1,2-DIBROMO-3-CHLOROPROPANE		ND		
1,2-DIBROMOETHANE		ND		
1,2-DICHLOROBENZENE		ND		
1,2-DICHLOROETHANE		ND		
1,2-DICHLOROPROPANE		ND		
1,3-DICHLOROBENZENE		ND		
1,4-DICHLOROBENZENE		ND		
2-HEXANONE		ND		
ACETONE		ND		
BENZENE		ND		
BROMODICHLOROMETHANE		ND		
BROMOFORM		ND		
BROMOMETHANE		ND		
CARBON DISULFIDE		ND		
CARBON TETRACHLORIDE		ND		
CHLOROBENZENE		ND		
CHLOROETHANE		ND		
CHLOROFORM		ND		
CHLOROMETHANE		ND		
CIS-1,2-DICHLOROETHYLENE		ND		
CIS-1,3-DICHLOROPROPENE		ND		
CYCLOHEXANE		ND		
DIBROMOCHLOROMETHANE		ND		
DICHLORODIFLUOROMETHANE		ND		
ETHYLBENZENE		ND		
ISOPROPYLBENZENE		ND		
METHYL ACETATE		ND		
METHYL ETHYL KETONE		ND		
METHYL ISOBUTYL KETONE		ND		
METHYLCYCLOHEXANE		ND		
METHYLENE CHLORIDE		ND		

Risk Addtivity
Soil Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC538-IS-0011-062912		OTC538-IS-0012-110612	
			Sample Date	6/29/2012		11/6/2012	
			Location	MW-01 (STA 4)		MW-01 (STA 4) Confirmation	
			Depth (ft bgs)	25 - 27		25 - 27	
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)							
STYRENE	NE	6300	7280	0.0022	U	NA	
TERT-BUTYL METHYL ETHER	NE	43	901	0.0017	U	NA	
TETRACHLOROETHYLENE	NE	22	7.02	0.00086	U	NA	
TOLUENE	NE	5000	5270	0.001	U	NA	
TRANS-1,2-DICHLOROETHENE	NE	150	270	0.0013	U	NA	
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.00095	U	NA	
TRICHLOROETHYLENE	NE	0.91	8.77	0.001	U	NA	
TRICHLOROFLUOROMETHANE	NE	790	1410	0.0017	U	NA	
VINYL CHLORIDE	NE	0.06	0.728	0.0013	U	NA	
XYLENES, TOTAL	NE	630	814	0.0028	U	NA	
SEMIVOLATILES (mg/kg)							
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	0.019	U	NA	
2,4,5-TRICHLOROPHENOL	NE	6100	6110	0.019	U	NA	
2,4,6-TRICHLOROPHENOL	NE	44	61.1	0.019	U	NA	
2,4-DICHLOROPHENOL	NE	180	183	0.019	U	NA	
2,4-DIMETHYLPHENOL	NE	1200	1220	0.024	U	NA	
2,4-DINITROPHENOL	NE	120	122	0.39	U	NA	
2,4-DINITROTOLUENE	NE	1.6	15.7	0.019	U	NA	
2,6-DINITROTOLUENE	NE	61	61.1	0.023	U	NA	
2-CHLORONAPHTHALENE	NE	6300	6260	0.039	U	NA	
2-CHLOROPHENOL	NE	390	391	0.019	U	NA	
2-METHYLNAPHTHALENE	NE	230	NE	0.019	U	NA	
2-METHYLPHENOL	NE	3100	NE	0.019	U	NA	
2-NITROANILINE	NE	610	NE	0.039	U	NA	
2-NITROPHENOL	NE	NE	NE	0.019	U	NA	
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	0.039	U	NA	
3-NITROANILINE	NE	NE	NE	0.039	U	NA	
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	0.078	U	NA	
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.019	U	NA	
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	0.019	U	NA	
4-CHLOROANILINE	NE	2.4	NE	0.019	U	NA	
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.019	U	NA	
4-NITROANILINE	NE	24	NE	0.039	U	NA	
4-NITROPHENOL	NE	NE	NE	0.16	U	NA	
ACENAPHTHENE	NE	3400	3440	0.019	U	NA	
ACENAPHTHYLENE	NE	NE	NE	0.019	U	NA	
ACETOPHENONE	NE	7800	7820	0.019	U	NA	
ANTHRACENE	NE	17000	17200	0.019	U	NA	
ATRAZINE	NE	2.1	NE	0.019	U	NA	

Risk Additivity Evaluation at Building 1201, Holloman AFB

Analyte	C / N	0-10 ft bgs Max Hit (mg/kg)	Cancer Risk	NC ratio
VOLATILES - continued (mg/kg)		ND		
STYRENE		ND		
TERT-BUTYL METHYL ETHER		ND		
TETRACHLOROETHYLENE		ND		
TOLUENE		ND		
TRANS-1,2-DICHLOROETHENE		ND		
TRANS-1,3-DICHLOROPROPENE		ND		
TRICHLOROETHYLENE		ND		
TRICHLOROFLUOROMETHANE		ND		
VINYL CHLORIDE		ND		
XYLENES, TOTAL		ND		
SEMIVOLATILES (mg/kg)		ND		
2,2'-OXYBIS(1-CHLORO)PROPANE		ND		
2,4,5-TRICHLOROPHENOL		ND		
2,4,6-TRICHLOROPHENOL		ND		
2,4-DICHLOROPHENOL		ND		
2,4-DIMETHYLPHENOL		ND		
2,4-DINITROPHENOL		ND		
2,4-DINITROTOLUENE		ND		
2,6-DINITROTOLUENE		ND		
2-CHLORONAPHTHALENE		ND		
2-CHLOROPHENOL		ND		
2-METHYLNAPHTHALENE		ND		
2-METHYLPHENOL		ND		
2-NITROANILINE		ND		
2-NITROPHENOL		ND		
3,3'-DICHLOROBENZIDINE		ND		
3-NITROANILINE		ND		
4,6-DINITRO-2-METHYLPHENOL		ND		
4-BROMOPHENYL PHENYL ETHER		ND		
4-CHLORO-3-METHYLPHENOL		ND		
4-CHLOROANILINE		ND		
4-CHLOROPHENYL PHENYL ETHER		ND		
4-NITROANILINE		ND		
4-NITROPHENOL		ND		
ACENAPHTHENE		ND		
ACENAPHTHYLENE		ND		
ACETOPHENONE		ND		
ANTHRACENE		ND		
ATRAZINE		ND		

Risk Addtivity
Soil Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC538-IS-0011-062912		OTC538-IS-0012-110612	
				Sample Date	6/29/2012		11/6/2012	
				Location	MW-01 (STA 4)		MW-01 (STA 4) Confirmation	
				Depth (ft bgs)	25 - 27		25 - 27	
					Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)								
BENZALDEHYDE	NE	7800	NE	0.19	U	NA		
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.019	U	NA		
BENZO(A)PYRENE	NE	0.015	0.148	0.019	U	NA		
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.019	U	NA		
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.019	U	NA		
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.019	U	NA		
BENZYL BUTYL PHTHALATE	NE	260	NE	0.039	U	NA		
BIPHENYL	NE	51	57.1	0.019	U	NA		
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.019	U	NA		
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.019	U	NA		
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.078	U	NA		
CAPROLACTAM	NE	31000	NE	0.062	U	NA		
CARBAZOLE	NE	NE	NE	0.019	U	NA		
CHRYSENE	NE	15	148	0.019	U	NA		
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.019	U	NA		
DIBENZOFURAN	NE	78	NE	0.019	U	NA		
DIETHYL PHTHALATE	NE	49000	48900	0.078	U	NA		
DIMETHYL PHTHALATE	NE	611000	611000	0.039	U	NA		
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.078	U	NA		
DI-N-OCTYLPHTHALATE	NE	730	NE	0.039	U	NA		
FLUORANTHENE	NE	2300	2290	0.019	U	NA		
FLUORENE	NE	2300	2290	0.019	U	NA		
HEXACHLOROBENZENE	NE	0.3	3.04	0.019	U	NA		
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.039	U	NA		
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.085	U	NA		
HEXACHLOROETHANE	NE	12	42.8	0.039	U	NA		
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.019	U	NA		
ISOPHORONE	NE	510	5120	0.019	U	NA		
M,P-CRESOL	NE	NE	NE	0.028	U	NA		
NAPHTHALENE	NE	3.6	43.0	0.031	U	NA		
NITROBENZENE	NE	4.8	53.5	0.019	U	NA		
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.019	U	NA		
N-NITROSODIPHENYLAMINE	NE	99	993	0.019	U	NA		
PENTACHLOROPHENOL	NE	0.89	8.94	0.23	U	NA		
PHENANTHRENE	NE	1830	1830	0.019	U	NA		
PHENOL	NE	18000	18300	0.019	U	NA		
PYRENE	NE	1700	1720	0.019	U	NA		

Risk Additivity Evaluation at Building 1201, Holloman AFB

Analyte	C / N	0-10 ft bgs Max Hit (mg/kg)	Cancer Risk	NC ratio
SEMIVOLATILES - continued (mg/kg)		ND		
BENZALDEHYDE		ND		
BENZO(A)ANTHRACENE		ND		
BENZO(A)PYRENE		ND		
BENZO(B)FLUORANTHENE		ND		
BENZO(G,H,I)PERYLENE		ND		
BENZO(K)FLUORANTHENE		ND		
BENZYL BUTYL PHTHALATE		ND		
BIPHENYL		ND		
BIS(2-CHLOROETHOXY) METHANE		ND		
BIS(2-CHLOROETHYL) ETHER		ND		
BIS(2-ETHYLHEXYL) PHTHALATE		ND		
CAPROLACTAM		ND		
CARBAZOLE		ND		
CHRYSENE		ND		
DIBENZ(A,H)ANTHRACENE		ND		
DIBENZOFURAN		ND		
DIETHYL PHTHALATE		ND		
DIMETHYL PHTHALATE		ND		
DI-N-BUTYL PHTHALATE		ND		
DI-N-OCTYLPHTHALATE		ND		
FLUORANTHENE		ND		
FLUORENE		ND		
HEXACHLOROBENZENE		ND		
HEXACHLOROBUTADIENE		ND		
HEXACHLOROCYCLOPENTADIENE		ND		
HEXACHLOROETHANE		ND		
INDENO(1,2,3-C,D)PYRENE		ND		
ISOPHORONE		ND		
M,P-CRESOL		ND		
NAPHTHALENE		ND		
NITROBENZENE		ND		
N-NITROSODI-N-PROPYLAMINE		ND		
N-NITROSODIPHENYLAMINE		ND		
PENTACHLOROPHENOL		ND		
PHENANTHRENE		ND		
PHENOL		ND		
PYRENE		ND		

Risk Addtivity
Soil Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC538-IS-0011-062912		OTC538-IS-0012-110612	
				Sample Date	6/29/2012		11/6/2012	
				Location	MW-01 (STA 4)		MW-01 (STA 4) Confirmation	
				Depth (ft bgs)	25 - 27		25 - 27	
					Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)								
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.062	U	NA		
1,3-DINITROBENZENE	NE	6.10	NE	0.062	U	NA		
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.062	U	NA		
2,4-DINITROTOLUENE	NE	1.60	15.7	0.075	U	NA		
2,6-DINITROTOLUENE	NE	61.0	61.1	0.068	U	NA		
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.062	U	NA		
2-NITROTOLUENE	NE	2.90	29.1	0.062	U	NA		
3-NITROTOLUENE	NE	6.10	7.82	0.062	U	NA		
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.062	U	NA		
4-NITROTOLUENE	NE	30.0	244.4	0.079	U	NA		
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.062	U	NA		
NITROBENZENE	NE	4.80	53.5	0.072	U	NA		
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.062	U	NA		
TETRYL	NE	240.0	244.0	0.062	U	NA		
PCBS (mg/kg)								
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0078	U	NA		
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.0098	U	NA		
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.0098	U	NA		
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0078	U	NA		
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0078	U	NA		
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0078	U	NA		
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0078	U	NA		
METALS (mg/kg)								
ALUMINUM	13722	77000	78000	3840		NA		
ANTIMONY	1.6	31	31.3	0.98	U	NA		
ARSENIC	3.7	0.39	3.90	19.2		8.1		
BARIUM	169.3	15000	15600	32.4	J	NA		
BERYLLIUM	1.6	160	156	0.49	U	NA		
CADMIUM	0.3	70	70.3	0.49	U	NA		
CALCIUM	317332	NE	NE	117000		NA		
CHROMIUM[d]	25	117000	117000	6.6		NA		
COBALT	7.7	23	NE	2.9	J	NA		
COPPER	13	3100	3130	4.7	J	NA		
IRON	23049	55000	54800	11800		7020		
LEAD	10.9	400	400	3.2	J	NA		
MAGNESIUM	16991	NE	NE	2380	J	NA		
MANGANESE	393	1800	1860	162		NA		
MERCURY	0.0108	10	15.6	0.0093	U	NA		
NICKEL	17.4	1500	1560	5.7	J	NA		
POTASSIUM	5077	NE	NE	791	J	NA		

Risk Additivity Evaluation at Building 1201, Holloman AFB

Analyte	C / N	0-10 ft bgs Max Hit (mg/kg)	Cancer Risk	NC ratio
EXPLOSIVES (mg/kg)		ND		
1,3,5-TRINITROBENZENE		ND		
1,3-DINITROBENZENE		ND		
2,4,6-TRINITROTOLUENE		ND		
2,4-DINITROTOLUENE		ND		
2,6-DINITROTOLUENE		ND		
2-AMINO-4,6-DINITROTOLUENE		ND		
2-NITROTOLUENE		ND		
3-NITROTOLUENE		ND		
4-AMINO-2,6-DINITROTOLUENE		ND		
4-NITROTOLUENE		ND		
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE		ND		
NITROBENZENE		ND		
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE		ND		
TETRYL		ND		
PCBS (mg/kg)		ND		
PCB-1016 (AROCLOR 1016)		ND		
PCB-1221 (AROCLOR 1221)		ND		
PCB-1232 (AROCLOR 1232)		ND		
PCB-1242 (AROCLOR 1242)		ND		
PCB-1248 (AROCLOR 1248)		ND		
PCB-1254 (AROCLOR 1254)		ND		
PCB-1260 (AROCLOR 1260)		ND		
METALS (mg/kg)				
ALUMINUM	N	8990		0.12
ANTIMONY		ND		
ARSENIC	C	2.2	5.64E-06	
BARIUM	N	108		0.0069
BERYLLIUM	N	0.41		0.0026
CADMIUM		ND		
CALCIUM	NUTRIENT	258000		
CHROMIUMd	N	8.2		0.000070
COBALT	N	3		0.13
COPPER	N	7.4		0.0024
IRON	N	8010		0.15
LEAD	N	80.4		0.20
MAGNESIUM	NUTRIENT	5820		
MANGANESE	N	187		0.10
MERCURY		ND		
NICKEL	N	6.6		0.0042
POTASSIUM	NUTRIENT	2290		

Risk Addtivity
Soil Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC538-IS-0011-062912	
				Sample Date		6/29/2012	
				Location		MW-01 (STA 4)	
				Depth (ft bgs)		25 - 27	
				Result	VQ	Result	VQ
METALS (mg/kg)							
SELENIUM	1.4	390	391	2	U	NA	
SILVER	1.1	390	391	0.49	U	NA	
SODIUM	5196	NE	NE	656	J	NA	
THALLIUM	1.3	0.78	0.782	1.3	U	NA	
VANADIUM	42.6	390	391	45.8		NA	
ZINC	54.6	23000	23500	15.3		NA	
PETROLEUM HYDROCARBONS (mg/kg)							
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	2.2	U	NA	
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	3.8	U	NA	
OIL RANGE ORGANICS C28-C40	NE	NE	1000	3.8	U	NA	
CYANIDE (mg/kg)							
CYANIDE	NE	22.0	46.9	0.14	U	NA	
TRITIUM (pCi/g)							
TRITIUM	NE	NE	NE	4.84	U	NA	

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC538-IS-0012-110612	
				Sample Date		11/6/2012	
				Location		MW-01 (STA 4) Confirmation	
				Depth (ft bgs)		25 - 27	
				Result	VQ	Result	VQ
METALS (mg/kg)							
SELENIUM	1.4	390	391	2	U	NA	
SILVER	1.1	390	391	0.49	U	NA	
SODIUM	5196	NE	NE	656	J	NA	
THALLIUM	1.3	0.78	0.782	1.3	U	NA	
VANADIUM	42.6	390	391	45.8		NA	
ZINC	54.6	23000	23500	15.3		NA	
PETROLEUM HYDROCARBONS (mg/kg)							
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	2.2	U	NA	
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	3.8	U	NA	
OIL RANGE ORGANICS C28-C40	NE	NE	1000	3.8	U	NA	
CYANIDE (mg/kg)							
CYANIDE	NE	22.0	46.9	0.14	U	NA	
TRITIUM (pCi/g)							
TRITIUM	NE	NE	NE	4.84	U	NA	

Risk Additivity Evaluation at Building 1201, Holloman AFB

Analyte	C / N	0-10 ft bgs Max Hit (mg/kg)	Cancer Risk	NC ratio
METALS (mg/kg)				
SELENIUM		ND		
SILVER		ND		
SODIUM	NUTRIENT	1020		
THALLIUM		ND		
VANADIUM	N	14.3		0.037
ZINC	N	42.7		0.0018
PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10		ND		
DIESEL RANGE ORGANICS C10-C28		ND		
OIL RANGE ORGANICS C28-C40	N	8.39		0.0084
CYANIDE (mg/kg)				
CYANIDE		ND		
TRITIUM (pCi/g)				
TRITIUM		ND		
SUM:			**5.64E-06**	**0.76**

Risk Addtivity
Soil Analytical Data
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Appendix M
Ecological Evaluation

NEW MEXICO ENVIRONMENT DEPARTMENT
SITE ASSESSMENT CHECKLIST
(From NMED (2012) Attachment A)

I. SITE LOCATION

1. Site Name: Building 1201 (OT-C538) Inactive Septic System
   US EPA I.D. Number: NM6572124422
   Location: Tularosa Basin within Holloman Air Force Base (HAFB)
   County: Otero
   City: HAFB State: NM

2. Latitude: 32º 52´ 21.384˝ N Longitude: 106º 5´ 16.154˝ W

3. Attach site maps, including a topographical map, a diagram which illustrates the layout of the facility (e.g., site boundaries, structures, etc.), and maps showing all habitat areas identified in Section III of the checklist. Also, include maps which illustrate known release areas, sampling locations, and any other important features, if available.

Note: Site maps and supporting information that include (1) a Physiographic Map, (2) a Site Layout and Sampling Location Map, and (3) a Site Photo Log are generally included for all sites in the RFI reports. A site habitat map and a Google Earth photo that shows the site habitat are attached to this Site Assessment Checklist.

II. SITE CHARACTERIZATION

1. Indicate the approximate area of the site (i.e., acres or sq. ft):

   Buildings 1200 and 1201 are collocated and together occupy a site approximately 6 acres in size.

2. Provide an approximate breakdown of the land uses on the site:

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	_____% Undisturbed	100% Other[c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, etc.):

_____

[b]For agricultural areas, please list the crops and/or livestock which are present:

_____

[c]For areas designated as "other", please describe the usage of the area:

Building 1201, historically known as the Aerospace Medical Laboratory, was constructed in 1951 as one of several laboratories used for aeromedical research and is associated with the Primate Research Facility. The Septic Tanks Report (included as Appendix A) indicates that the building contained an autopsy/mortuary room, photography room, and animal cages. During a site inspection conducted in 2007, it was discovered that the bathroom drain was separate from the work area drain and that all floor drains had been plugged. The septic tank was abandoned in place in January 2008 by opening the tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill (North Wind, Inc., 2008).

3. Provide an approximate breakdown of the land uses in the area surrounding the site. Indicate the radius (in miles) of the area described: approximately 0.5 mile

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	80 % Undisturbed	20 % Other [c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, golf course, etc.):

_____

[b]For agricultural areas, please list the crops and/or livestock which are present:

_____

[c]For areas designated as "other", please describe the usage of the area:
Habitat Map for Holloman AFB (attached) shows that habitat within 0.5 mile radius is dominated by fourwing saltbush/alkali sacaton shrubland. To the north of the site there is a mix of fourwing saltbush/alkali sacaton shrubland, fourwing saltbush shrubland with honey mesquite, and fourwing saltbush gypsum dropseed shrubland. There is also some areas to the northeast of the site that are shown as Development/Ground Disturbance.

4. Describe reasonable and likely future land and/or water use(s) at the site.
Land use is likely to remain the same.

5. Describe the historical uses of the site. Include information on chemical releases that may have occurred as a result of previous land uses. For each chemical release, provide information on the form of the chemical released (i.e., solid, liquid, vapor) and the known or suspected causes or mechanism of the release (i.e., spills, leaks, material disposal, dumping, explosion, etc.).

_____

Building 1201, historically known as the Aerospace Medical Laboratory, was constructed in 1951 as one of several laboratories used for aeromedical research and is associated with the Primate Research Facility. The Septic Tanks Report (included as Appendix A) indicates that the building contained an autopsy/mortuary room, photography room, and animal cages. At the time of a survey conducted in 1995, the building use is listed as carpentry shop, employee break room, and office space

(HAFB, 2007). According to the Septic Tanks Report (HAFB, 2007), a survey conducted in November 2007 determined that the building was unused. Site use is likely to remain the same.

6. If any movement of soil has taken place at the site, describe the degree of the disturbance. Indicate the likely source of any disturbances (e.g., erosion, agricultural, mining, industrial activities, removals, etc.) and estimate when these events occurred.

Site disturbances of soil have been limited to excavation activities associated with building construction and septic system installation and septic system closure activities.

7. Describe the current uses of the site. Include information on recent (previous 5 years) disturbances or chemical releases that have occurred. For each chemical release, provide information on the form of the chemical released and the causes or mechanism of the release.

Building 1201 is currently unused. The septic tank was abandoned in place in January 2008 by opening the tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill (North Wind, Inc., 2008).

8. Identify the location or suspected location of chemical releases at the site. Provide an estimate of the distance between these locations and the areas identified in Section III.

Chemical releases that may have occurred are associated with septic system leakage.

9. Identify the suspected contaminants of concern (COCs) at the site. If known, include the maximum contaminant levels. Please indicate the source of data cited (e.g., RFI, confirmatory sampling, etc.).

As documented in the RFI, detected constituents from soil samples collected include several metals and petroleum hydrocarbons (oil range organics only). Additionally, samples were analyzed for VOCs, SVOCs, explosives, PCBs, petroleum hydrocarbons (gasoline and diesel range), cyanide, and tritium; however all were non-detect in soil samples from the site (for 0 to 10 feet bgs, the zone of interest for ecological receptors).

10. Identify the media (e.g., soil (surface or subsurface), surface water, air, groundwater) which are known or suspected to contain COCs. _____
Surface and subsurface soil, and potentially, groundwater

11. Indicate the approximate depth to groundwater (in feet below ground surface [(bgs)].

Depth to groundwater as measured from monitoring well OTC538-MW01 is approximately 29.7 feet from top of PVC casing.

12. Indicate the direction of groundwater flow (e.g., north, southeast, etc.)

According to Figure 2-3 of the RFI report, the direction of groundwater flow at Holloman AFB has been shown to be generally from northeast to southwest. According to this figure, groundwater flow direction in the vicinity of Building 1201 is to the southwest.

III. HABITAT EVALUATION

III.A Wetland Habitats

Are any wetland[1] areas such as marshes or swamps on or adjacent to the site?

☐ Yes X No

If yes, indicate the wetland area on the attached site map and answer the following questions regarding the wetland area. If more than one wetland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wetland area. Distinguish between wetland areas by using names or other designations (such as location), and clearly identify each area on the site map. Also, obtain and attach a National Wetlands Inventory Map (or maps) to illustrate each wetland area.

Identify the sources of the observations and information (e.g., National Wetland Inventory, Federal or State Agency, USGS topographic maps) used to make the determination that wetland areas are or are not present.

The Integrated Natural Resource Management Plan for Holloman AFB (HAFB, 2011) and site observations.

If no wetland areas are present, proceed to Section III.B.

1Wetlands are defined in 40 CFR §232.2 as " Areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Examples of typical wetlands plants include: cattails, cordgrass, willows and cypress trees. National wetland inventory maps may be available at http:\\nwi.fws.gov. Additional information on wetland delineation criteria is also available from the Army Corps of Engineers.

Wetland Area Questions

☐ Onsite ☐ Offsite

Name or
Designation:_____

1. Indicate the approximate area of the wetland (acres or ft^2)_____

2. Identify the type(s) of vegetation present in the wetland.

   - ❑ Submergent (i.e., underwater) vegetation
   - ❑ Emergent (i.e., rooted in the water, but rising above it) vegetation
   - ❑ Floating vegetation
   - ❑ Scrub/shrub
   - ❑ Wooded
   - ❑ Other (Please describe):_____

3. Estimate the vegetation density of the wetland area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Is standing water present? ☐ Yes ☐ No

   If yes, is the water primarily: ☐ Fresh or ☐ Brackish
   Indicate the approximate area of the standing water (ft^2): _____
   Indicate the approximate depth of the standing water, if known (ft. or in.)_____

5. If known, indicate the source of the water in the wetland.

   - ❑ Stream/River/Creek/Lake/Pond
   - ❑ Flooding
   - ❑ Groundwater
   - ❑ Surface runoff

6. Is there a discharge from the facility to the wetland? ☐ Yes ☐ No

   If yes, please
   describe:_____
   _____
   _____
   _____
   _____

Wetland Area Questions (Continued)

7. Is there a discharge from the wetland? ☐ Yes ☐ No
   If yes, indicate the type of aquatic feature the wetland discharges into:

   - ❑ Surface stream/River (Name:_____)
   - ❑ Lake/Pond (Name:_____)
   - ❑ Groundwater
   - ❑ Not sure

8. Does the area show evidence of flooding? ☐ Yes ☐ No
   If yes, indicate which of the following are present (mark all that apply):

   - ❑ Standing water
   - ❑ Water-saturated soils
   - ❑ Water marks
   - ❑ Buttressing
   - ❑ Debris lines
   - ❑ Mud cracks
   - ❑ Other (Please describe):_____

9. Animals observed in the wetland area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:

   _____
   _____
   _____
   _____

III.B Aquatic Habitats

III.B.1 Non-Flowing Aquatic Features

Are any non-flowing aquatic features (such as ponds or lakes) located at or adjacent to the site?

☐ Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the non-flowing aquatic features. If more than one non-flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.B.2.

Non-Flowing Aquatic Feature Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Indicate the type of aquatic feature present:

   - ❑ Natural (e.g., pond or lake)
   - ❑ Man-made (e.g., impoundment, lagoon, canal, etc.)

2. Estimate the approximate size of the water body (in acres or sq. ft.)_____

3. If known, indicate the depth of the water body (in ft. or in.)._____

Non-Flowing Aquatic Feature Questions (Continued)

4. Indicate the general composition of the bottom substrate. Mark all sources that apply from the following list.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

☐ Other (please specify):_____

5. Indicate the source(s) of the water in the aquatic feature. Mark all sources that apply from the following list.

- ❑ River/Stream/Creek
- ❑ Groundwater
- ❑ Industrial Discharge
- ❑ Surface Runoff
- ❑ Other (please specify):_____

6. Is there a discharge from the facility to the aquatic feature? ☐ Yes ☐ No

If yes, describe the origin of each discharge and its migration path:

_____

_____

_____

_____

7. Does the aquatic feature discharge to the surrounding environment? ☐ Yes ☐ No

If yes, indicate the features from the following list into which the aquatic feature discharges, and indicate whether the discharge occurs onsite or offsite:

- ❑ River/Stream/Creek ☐ onsite ☐ offsite
- ❑ Groundwater ☐ onsite ☐ offsite
- ❑ Wetland ☐ onsite ☐ offsite
- ❑ Impoundment ☐ onsite ☐ offsite
- ❑ Other (please describe)_____

Non-Flowing Aquatic Feature Questions (Continued)

8. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Fish
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, turtles)
- ❑ Amphibians (e.g., frogs, salamanders)
- ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

Specify species, if known:

_____

_____

_____

_____

III.B.2 Flowing Aquatic Features

Are any flowing aquatic features (such as streams or rivers) located at or adjacent to the site?

☐ Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the flowing aquatic features. If more than one flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map

If no, proceed to Section III.C.

Flowing Aquatic Feature Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Indicate the type of flowing aquatic feature present.

   - ❑ River
   - ❑ Stream
   - ❑ Creek
   - ❑ Brook
   - ❑ Dry wash
   - ❑ Arroyo
   - ❑ Intermittent stream
   - ❑ Artificially created (ditch, etc.)
   - ❑ Other (specify)
   - ❑

2. Indicate the general composition of the bottom substrate.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

   ☐ Other (please specify):_____

3. Describe the condition of the bank (e.g., height, slope, extent of vegetative cover) of the aquatic feature.

   _____
   _____
   _____
   _____

4. Is there a discharge from the facility to the aquatic feature? ☐ Yes ☐ No
   If yes, describe the origin of each discharge and its migration path:

   _____
   _____
   _____
   _____

5. Indicate the discharge point of the water body. Specify name, if known.

   _____
   _____
   _____

Flowing Aquatic Feature Questions (Continued)

6. If the flowing aquatic feature is a dry wash or arroyo, answer the following questions.
   - ❑ Check here if feature is not a dry wash or arroyo

   If known, specify the average number of days in a year in which flowing water is present in the feature: _____

   Is standing water or mud present? Check all that apply.
   - ❑ Standing water
   - ❑ Mud
   - ❑ Neither standing water or mud

   Does the area show evidence of recent flow (e.g., flood debris clinging to vegetation)?
   - ❑ Yes
   - ❑ No
   - ❑ Not sure
7. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:

   _____
   _____
   _____
   _____

III.C Terrestrial Habitats

III.C.1 Wooded

Are any wooded areas on or adjacent to the site? ☐ Yes X No

If yes, indicate the wooded area on the attached site map and answer the following questions. If more than one wooded area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wooded area. Distinguish between wooded areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.2.

Wooded Area Questions

☐ On-site ☐ Off-site

Name or Designation:_____

1. Estimate the approximate size of the wooded area (in acres or sq. ft.)

2. Indicate the dominant type of vegetation in the wooded area.

   - ❑ Evergreen
   - ❑ Deciduous
   - ❑ Mixed

Dominant plant species, if known:_____

3. Estimate the vegetation density of the wooded area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the predominant size of the trees at the site. Use diameter at chest height.

   - ❑ 0-6 inches
   - ❑ 6-12 inches
   - ❑ >12 inches
   - ❑ No single size range is predominant

5. Animals observed in the wooded area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:_____

III.C.2 Shrub/Scrub

Are any shrub/scrub areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the shrub/scrub area on the attached site map and answer the following questions. If more than one shrub/scrub area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual shrub/scrub area. Distinguish between shrub/scrub areas, using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.3.

Shrub/Scrub Area Questions

X Onsite X Offsite

Name or Designation: Chihuahuan Desert Scrub (HAFB, 2011).

Note also: On-site areas are almost entirely gravel covered and void of habitat or vegetation with some apparent pockets of desert vegetation. Surrounding site habitat is characterized as Chihuahuan Desert. The habitat map (attached) shows that habitat surrounding the site is dominated by fourwing saltbush/alkali sacaton shrubland habitat, with lesser amounts of fourwing saltbush shrubland with honey mesquite, and fourwing saltbush gypsum dropseed shrubland.

1. Estimate the approximate size of the shrub/scrub area (in acres or sq. ft.). Surrounding HAFB are tens of thousands of acres of Chihuahuan Desert Scrub.

2. Indicate the dominant type of shrub/scrub vegetation present, if known.

According to information provided in Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011), the area around Building 1201 (OT-C538) is dominated by fourwing saltbush/alkali sacaton shrubland with lesser amounts of fourwing saltbush shrubland with honey mesquite, and fourwing saltbush gypsum dropseed shrubland.

3. Estimate the vegetation density of the shrub/scrub area.

- ❑ Dense (i.e., greater than 75% vegetation)
- X Moderate (i.e., 25% to 75% vegetation)
- ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the scrub/shrub vegetation.

- ❑ 0-2 feet
- X 2-5 feet
- ❑ >5 feet

5. Animals observed in the shrub/scrub area or suspected to be present based on indirect evidence or file material:
   - X Birds
   - X Mammals
   - X Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:
   The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna associated with the shrubland habitat potentially present in the area of Building 1201.

Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam kangaroo rat (*Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus auduboni*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.3 Grassland

Are any grassland areas on or adjacent to the site? ☐ Yes X No

If yes, indicate the grassland area on the attached site map and answer the following questions. If more than one grassland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual grassland area. Distinguish between grassland areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.4.

Grassland Area Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Estimate the approximate size of the grassland area (in acres or sq. ft.)._____

2. Indicate the dominant plant type, if known.
_____
_____
_____
_____

3. Estimate the vegetation density of the grassland area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the dominant plant type (in ft. or in.)_

5. Animals observed in the grassland area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:

III.C.4 Desert

Are any desert areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the desert area on the attached site map and answer the following questions. If more than one desert area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual desert area. Distinguish between desert areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.5.

Desert Area Questions

X Onsite X Offsite
Name or Designation: Chihuahuan Desert

1. Estimate the approximate size of the desert area (in acres or sq. ft.).
This site including HAFB is contained within tens of thousands of acres of the Chihuahuan Desert.

2. Describe the desert area (e.g., presence or absence of vegetation, vegetation types, presence/size of rocks, sand, etc.)
Many volumes of literature have been written on the natural biota of the Chihuahuan Desert. Detailed descriptions about the biotic communities within HAFB can be found in the HAFB Integrated Natural Resource Management Plan, (HAFB, 2011). Habitats directly associated with this Site include typical desert scrub communities.

3. Animals observed in the desert area or suspected to be present based on indirect evidence or file material:

X Birds
X Mammals
X Reptiles (e.g., snakes, lizards)
☐ Amphibians (e.g., toads, salamanders)

Specify species, if known:

The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna associated with the shrubland habitat potentially present in the area of Building 1201. Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam

kangaroo rat (*Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubon*i), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.5 Other

1. Are there any other terrestrial communities or habitats on or adjacent to the site which were not previously described?

☐ Yes X No

If yes, indicate the "other" area(s) on the attached site map and describe the area(s) below. Distinguish between onsite and offsite areas. If no, proceed to Section III.D.

III.D Sensitive Environments and Receptors

1. Do any other potentially sensitive environmental areas[2] exist adjacent to or within 0.5 miles of the site? If yes, list these areas and provide the source(s) of information used to identify sensitive areas. *Do not answer "no" without confirmation from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

The following is taken from the Integrated Natural Resources Management Plan for HAFB (HAFB,2011). HAFB and its Geographically Separated Units (GSUs) have high biodiversity, including many sensitive species. No threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The White Sands pupfish is not Federally-listed nor has critical habitat been designated because of the multi-agency cooperative agreement to manage the species to support viable populations through habitat management and research.

Most of the sensitive species are birds that are either associated with grassland habitats on main base or with wetland habitats, primarily in the Lake Holloman Public Access Area wetlands complex south of the Cantonment. Sensitive grassland and desert species at HAFB that are discussed in further detail in the management plan include:

- White Sands pupfish

2 Areas that provide unique and often protected habitat for wildlife species. These areas are typically used during critical life stages such as breeding, hatching, rearing of young and overwintering. Refer to **Table 1** at the end of this document for examples of sensitive environments.

- Acarospora clauzadeana lichen
- Grassland neotropical migratory birds
- Western burrowing owl
- Aplomado falcon
- Grassland raptors
- Bats
- Texas horned lizard and other reptiles

2. Are any areas on or near (i.e., within 0.5 miles) the site which are owned or used by local tribes? If yes, describe. *Contact the Tribal Liason in the Office of the Secretary (505)827-2855 to obtain this information.*

No

3. Does the site serve or potentially serve as a habitat, foraging area, or refuge by rare, threatened, endangered, candidate and/or proposed species (plants or animals), or any otherwise protected species? If yes, identify species. *This information should be obtained from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

No, based on information in the Integrated Natural Resources Management Plan, no threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The plan establishes protocols for management of sensitive desert and grassland habitats.

4. Is the site potentially used as a breeding, roosting or feeding area by migratory bird species? If yes, identify which species.

Likely not. The site has very limited viable habitat due to the disturbed nature of the site, but areas surrounding the site could potentially provide habitat for these purposes.

5. Is the site used by any ecologically[3], recreationally, or commercially important species? If yes, explain.

No

3 Ecologically important species include populations of species which provide a critical (i.e., not replaceable) food resource for higher organisms and whose function as such would not be replaced by more tolerant species; or perform a critical ecological function (such as organic matter decomposition) and whose functions will not be replaced by other species. Ecologically important species include pest and opportunistic species that populate an area if they serve as a food source for other species, but do not include domesticated animals (e.g., pets and livestock) or plants/animals whose existence is maintained by continuous human interventions (e.g., fish hatcheries, agricultural crops, etc.,)

IV. EXPOSURE PATHWAY EVALUATION

1. Do existing data provide sufficient information on the nature, rate, and extent of contamination at the site?

   X Yes
   ❑ No
   ❑ Uncertain

   Please provide an explanation for your answer: Sample results have sufficiently characterized the site.

2. Do existing data provide sufficient information on the nature, rate, and extent of contamination in offsite affected areas?

   □ Yes
   ❑ No
   ❑ Uncertain
   X No offsite contamination

   Please provide an explanation for your answer:
   No offsite contamination is expected, and no off-site soil or groundwater samples were collected.

3. Do existing data address potential migration pathways of contaminants at the site?

   X Yes
   ❑ No
   ❑ Uncertain

   Please provide an explanation for your answer

   While potential migration from impacted soils to groundwater might occur, ecological receptors are not expected to contact groundwater.

4. Do existing data address potential migration pathways of contaminants in offsite affected areas?

   □ Yes
   ❑ No
   ❑ Uncertain
   X No offsite contamination

   Please provide an explanation for your answer:

   See response to No. 3 presented previously. Also, no off-site soil contamination is expected.

5. Are there visible indications of stressed habitats or receptors on or near (i.e., within 0.5 miles) the site that may be the result of a chemical release? If yes, explain. Attach photographs if available.

No.

6. Is the location of the contamination such that receptors might be reasonably expected to come into contact with it? For soil, this means contamination in the soil 0 to 5 feet below ground surface (bgs). If yes, explain.

Yes. Some soil samples were collected in site areas where receptors might contact detected constituents.

7. Are receptors located in or using habitats where chemicals exist in air, soil, sediment or surface water? If yes, explain.

Yes. See response to No. 6 presented above.

8. Could chemicals reach receptors via groundwater? Can chemicals leach or dissolve to groundwater? Are chemicals mobile in groundwater? Does groundwater discharge into receptor habitats? If yes, explain.

No. Ecological receptors are not expected to have contact with groundwater.

9. Could chemicals reach receptors through runoff or erosion? Answer the following questions:

What is the approximate distance from the contaminated area to the nearest watercourse or arroyo?

- ❑ 0 feet (i.e., contamination has reached a watercourse or arroyo)
- ❑ 1-10 feet
- ❑ 11-20 feet
- ❑ 21-50 feet
- ❑ 51-100 feet
- ❑ 101-200 feet
- ❑ > 200 feet
- ❑ > 500 feet
- X > 1000 feet

What is the slope of the ground in the contaminated area?

- X 0-10%
- ❑ 10-30%
- ❑ > 30%

What is the approximate amount of ground and canopy vegetative cover in the contaminated area?

- ❑ < 25%
- X 25-75%
- ❑ > 75%

Is there visible evidence of erosion (e.g., a rill or gully) in or near the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

Do any structures, pavement, or natural drainage features direct run-on flow (i.e., surface flows originating upstream or uphill from the area of concern) into the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

10. Could chemicals reach receptors through the dispersion of contaminants in air (e.g., volatilization, vapors, fugitive dust)? If yes, explain.

Yes. However, detected concentrations of constituents in soil do not generally exceeding relevant background values or ecological screening criteria (see screening assessment in main text).

11. Could chemicals reach receptors through migration of non-aqueous phase liquids (NAPLs)? Is a NAPL present at the site that might be migrating towards receptors or habitats? Could NAPL discharge contact receptors or their habitat?

No NAPLs are present at the site.

12. Could receptors be impacted by external irradiation at the site? Are gamma emitting radionuclides present at the site? Is the radionuclide contamination buried or at the surface?

No. No radionuclide contamination is expected to be present at the site.

PHOTOGRAPHIC DOCUMENTATION

During the site visit(s), photographs should be taken to document the current conditions at the site and to support the information entered in the checklist. For example, photographs may be used to document the following:

- The nature, quality, and distribution of vegetation at the site
- Receptors or evidence of receptors
- Potentially important ecological features, such as ponds and drainage ditches
- Potential exposure pathways
- Any evidence of contamination or impact

SUMMARY OF OBSERVATIONS AND SITE SETTING

Include information on significant source areas and migration pathways that are likely to constitute complete exposure pathways.

Although potentially complete exposure pathways exist (e.g. direct contact with surface soil), significant source areas are not present, as results of the screening assessment (see main text) indicate that detected concentrations of constituents in soil do not generally exceeding relevant ecological screening criteria.

Checklist Completed by William Squire

Affiliation CB&I Federal Services, LLC.

Author Assisted by William Stanhope, CB&I Federal Services, LLC.

Date July 29, 2013

Building 1201 Location

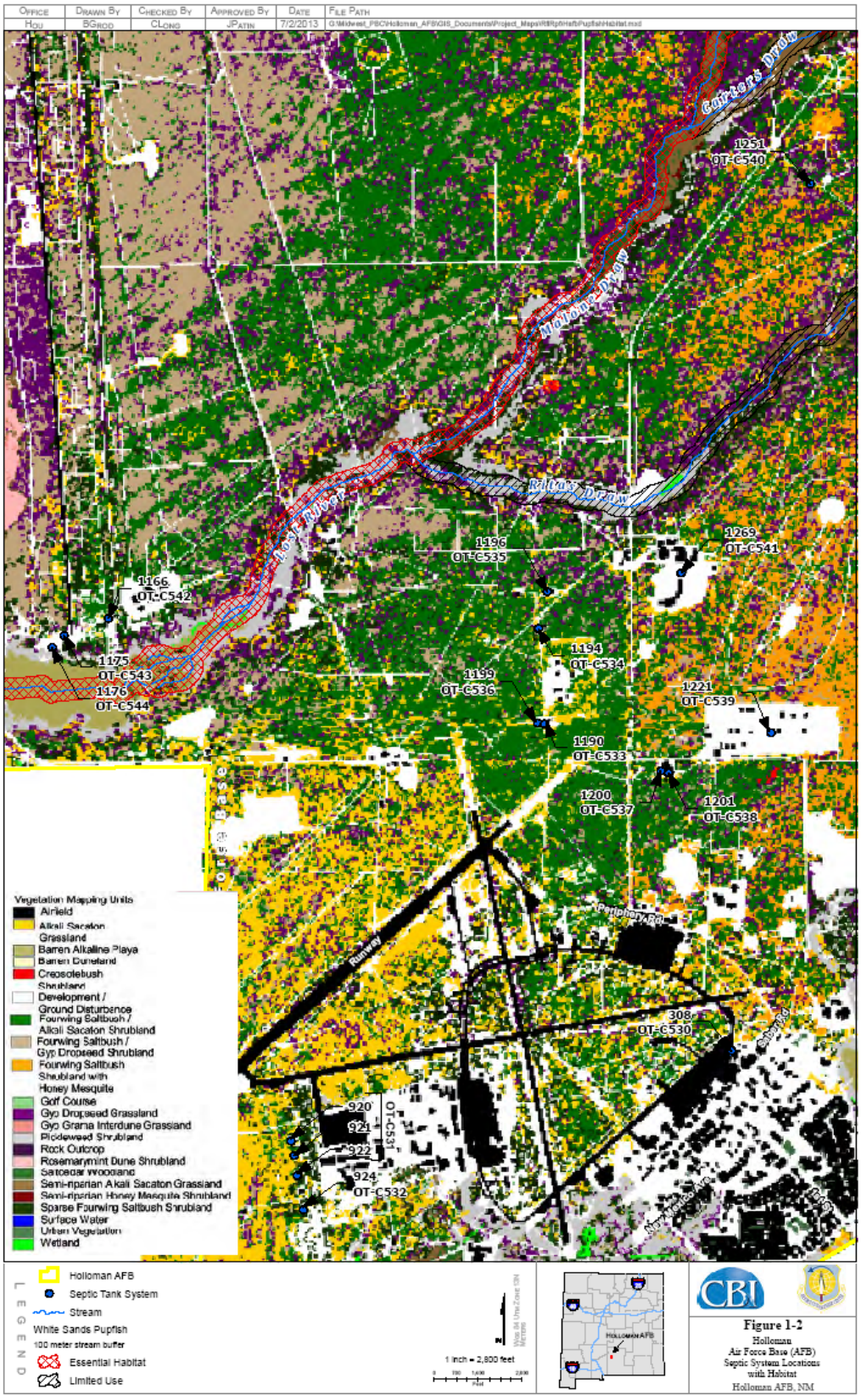

Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
with Habitat
Holloman AFB, NM

REFERENCES

Holloman Air Force Base (HAFB), 2011. *Integrated Natural Resource Management Plan*, February.

Holloman Air Force Base (HAFB), 2007. *Holloman Air Force Base Septic Tanks*, April.

New Mexico Environment Department (NMED), 2012. *Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document*, Hazardous Waste Bureau and Ground Water Quality Bureau, February, Table A-1 updated June 2012.

North Wind, Inc., 2008. *Technical Memorandum Summarizing Decommissioning Work Conducted on Inactive Septic Tanks at Holloman AFB*, March.

TABLE 1
EXAMPLES OF SENSITIVE ENVIRONMENTS

National Parks and National Monuments

Designated or Administratively Proposed Federal Wilderness Areas

National Preserves

National or State Wildlife Refuges

National Lakeshore Recreational Areas

Federal land designated for protection of natural ecosystems

State land designated for wildlife or game management

State designated Natural Areas

Federal or state designated Scenic or Wild River

All areas that provide or could potentially provide critical habitat[1] for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern

All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes

All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)

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1 Critical habitats are defined by the Endangered Species Act (50 CFR §424.02(d)) as:

> 1) Specific areas within the geographical area currently occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (ii) that may require special management considerations or protection, and 2) Specific areas outside the geographical area occupied by a species at the time it is listed upon a determination by the Secretary [of Interior] that such areas are essential for the conservation of the species.

All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)

All areas that provide or could potentially provide habitat for song birds as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-13)

All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)

All areas that provide or could potentially provide habitat for horned toads and Bullfrogs as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, resp.)

All perennial waters (e.g., rivers, lakes, playas, sloughs, ponds, etc)

All ephemeral drainage (e.g., arroyos, puddles/pools, intermittent streams, etc) that provide significant wildlife habitat or that could potentially transport contaminants off site to areas that provide wildlife habitat

All riparian habitats

All perennial and ephemeral wetlands (not limited to jurisdictional wetlands)

All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle.

ATTACHMENT B

ECOLOGICAL SITE EXCLUSION CRITERIA CHECKLIST AND DECISION TREE

1. NEW MEXICO ECOLOGICAL EXCLUSION CRITERIA CHECKLIST

The following questions are designed to be used in conjunction with the Ecological Exclusion Criteria Decision Tree (Figure 1). After answering each question, refer to the Decision Tree to determine the appropriate next step. In some cases, questions will be omitted as the user is directed to another section as indicated by the flow diagram in the Decision Tree. For example, if the user answers "yes" to Question 1 of Section I, he or she is directed to proceed to Section II.

I. Habitat

In the following questions, "affected property" refers to all property on which a release has occurred or is believed to have occurred, including off-site areas where contamination may have occurred or migrated.

1. Are any of the below-listed sensitive environments at, adjacent to, or in the locality1 of the affected property?

   - National Park or National Monument
   - Designated or administratively proposed Federal Wilderness Area
   - National Preserve
   - National or State Wildlife Refuge
   - Federal or State land designated for wildlife or game management
   - State designated Natural Areas
   - All areas that are owned or used by local tribes
   - All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle
   - All areas that provide or could potentially provide habitat for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern
   - All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes
   - All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)
   - All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)
   - All areas that provide or could potentially provide habitat for song birds as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game

1 *Locality* of the site refers to any area where an ecological receptor is likely to contact site-related chemicals. The locality of the site considers the likelihood of contamination migrating over time and places the site in the context of its general surrounding. Therefore, the locality is typically larger than the site and the areas adjacent to the site.

and Fish, 17-2-13)

- All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)
- All areas that provide or could potentially provide habitat for horned toads and bullfrogs as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, respectively)

2. Does the affected property contain land areas which were not listed in Question 1, but could be considered viable ecological habitat? The following are examples (but not a complete listing) of viable ecological habitats:

- Wooded areas
- Shrub/scrub vegetated areas
- Open fields (prairie)
- Other grassy areas
- Desert areas
- Any other areas which support wildlife and/or vegetation, excluding areas which support only opportunistic species (such as house mice, Norway rats, pigeons, etc.) that do not serve as prey to species in adjacent habitats.

The following features are <u>not</u> considered ecologically viable:

- Pavement
- Buildings
- Paved areas of roadways
- Paved/concrete equipment storage pads
- Paved manufacturing or process areas
- Other non-natural surface cover or structure

3. Does the affected property contain any perennial or ephemeral aquatic features which were not listed in Question 1?

II. Receptors

1. Is any part of the affected property used for habitat, foraging area, or refuge by any rare, threatened, or endangered species (plant *or* animal), or otherwise protected species (e.g., raptors, migratory birds)?

2. Is any part of the affected property used for habitat, foraging area, or refuge by any species used as a recreational (e.g., game animals) and/or commercial resource?

3. Is any part of the affected property used for habitat, foraging area, or refuge by any plant or animal species? This includes plants considered "weeds" and opportunistic insect and animal species (such as cockroaches and rats) if they are used as a food source for other species in the area.

III. Exposure Pathways

1. Could receptors be impacted by contaminants via direct contact?

   Is a receptor located in or using an area where it could contact contaminated air, soil3, or surface water?

For Questions 2 and 3, note that one must answer "yes" to all three bullets in order to be directed to the "exclusion denied" box of the decision tree. This is because answering "no" to one of the questions in the bullet list indicates that a complete exposure pathway is not present. For example, in Question 2, if the chemical cannot leach or dissolve to groundwater (bullet 1), there is no chance of ecological receptors being exposed to the chemical through contact with contaminated groundwater. Similarly, the responses to the questions in Question 4 determine whether a complete pathway exists for exposure to NAPL.

2. Could receptors contact contaminants via groundwater?
   - Can the chemical leach or dissolve to groundwater4?
   - Can groundwater mobilize the chemical?
   - Could (does) contaminated groundwater discharge into known or potential receptor habitats?

3. Could receptors contact contaminants via runoff (i.e., surface water and/or suspended sediment) or erosion by water or wind?
   - Are chemicals present in surface soils?
   - Can the chemical be leached from or eroded with surface soils?
   - Is there a receptor habitat located downgradient of the leached/eroded surface soil?

---

3 For soil, this means contamination less than 5 feet below ground surface (bgs).

4 Information on the environmental fate of specific chemicals can be found on the Internet at *http://www.epa.gov/opptintr/chemfact/* or at a local library in published copies of the *Hazardous Substances Data Bank*.

4. Could receptors contact contaminants via migration of non-aqueous phase liquids (NAPL)?

- Is NAPL present at the site?
- Is NAPL migrating toward potential receptors or habitats?
- Could NAPL discharge impact receptors or habitats?

Figure 1 -Ecological Exclusion Criteria Decision Tree

(Refer to corresponding checklist for the full text of each question)

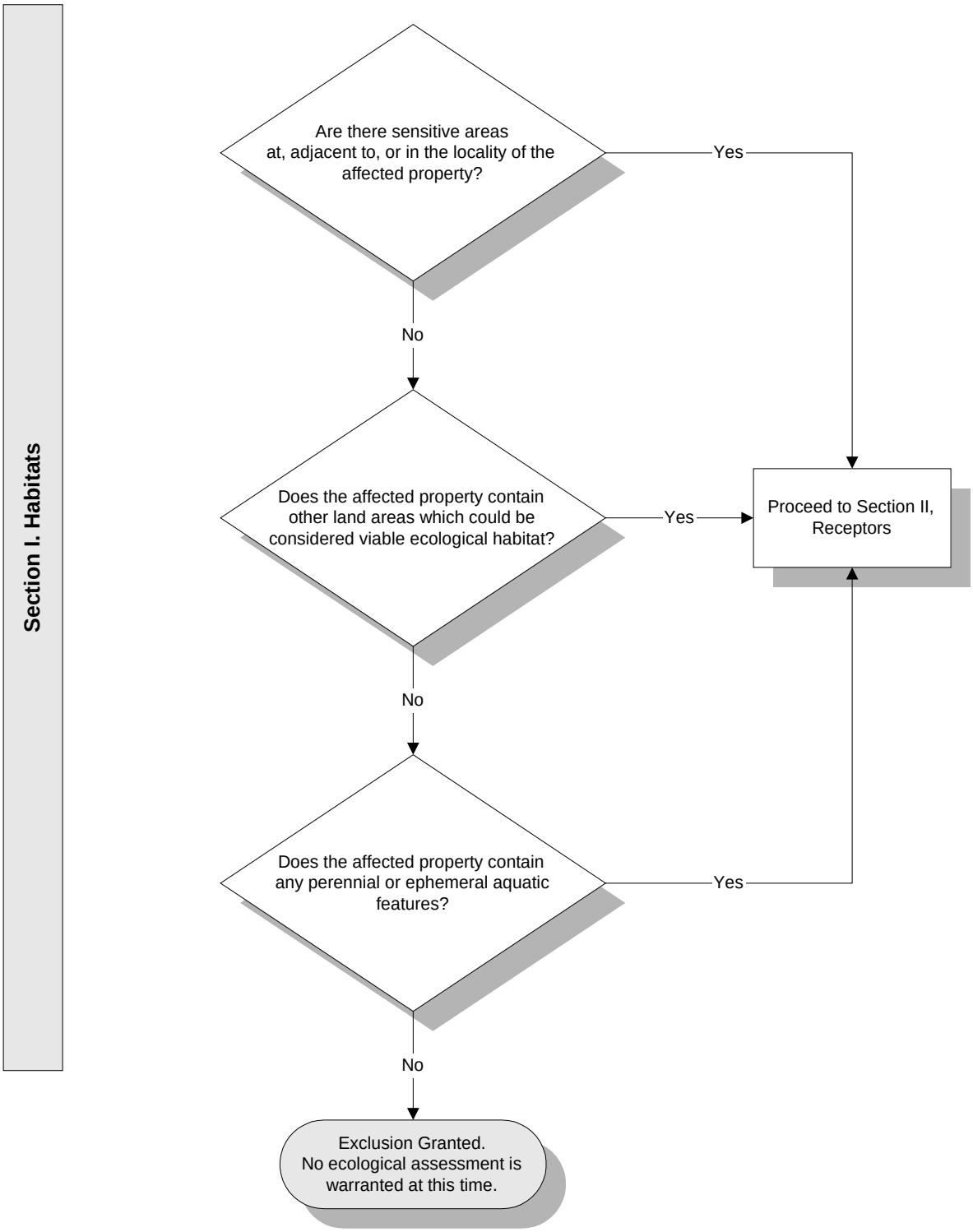


Figure 1 - Exclusion Criteria Decision Tree (continued)

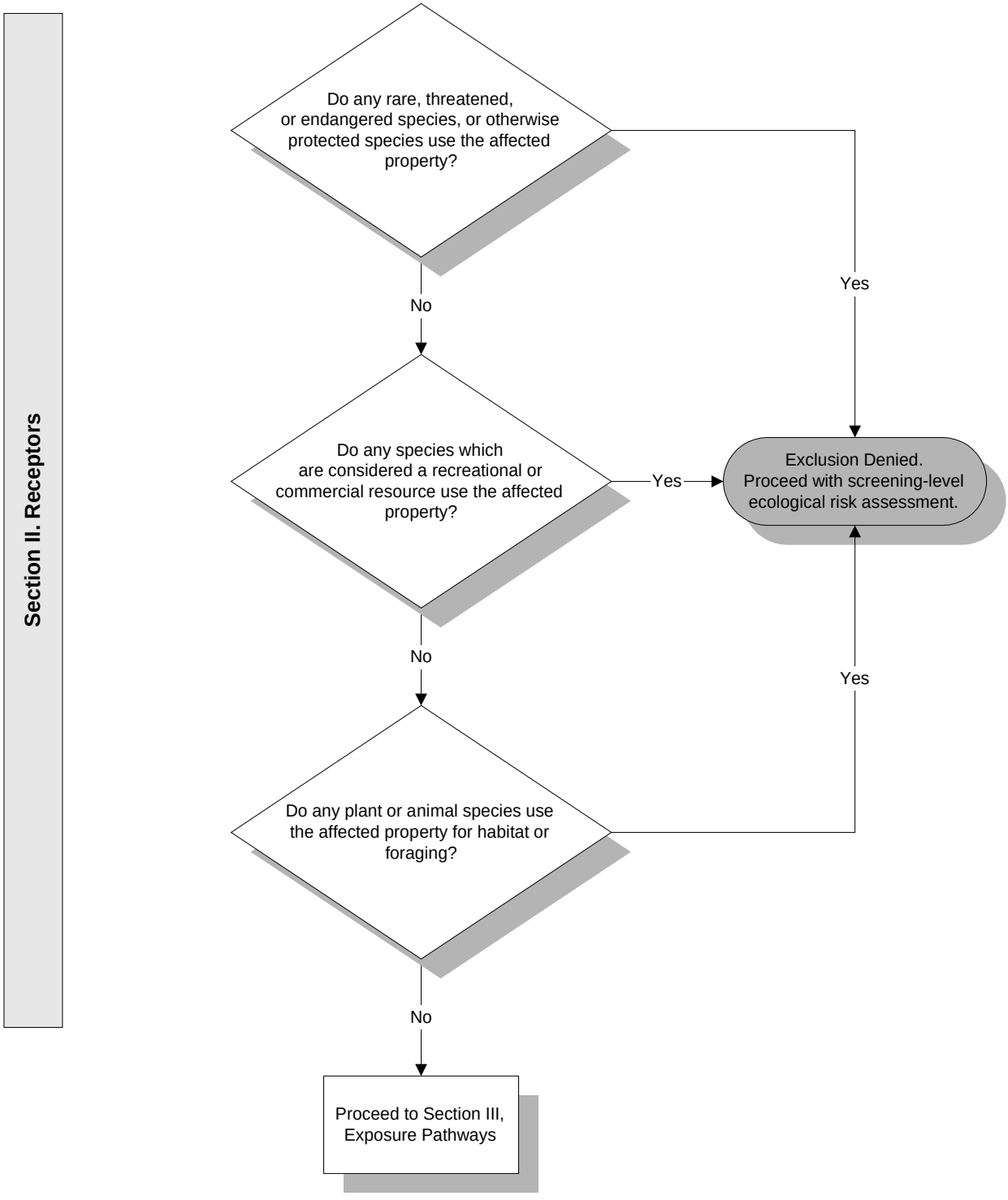
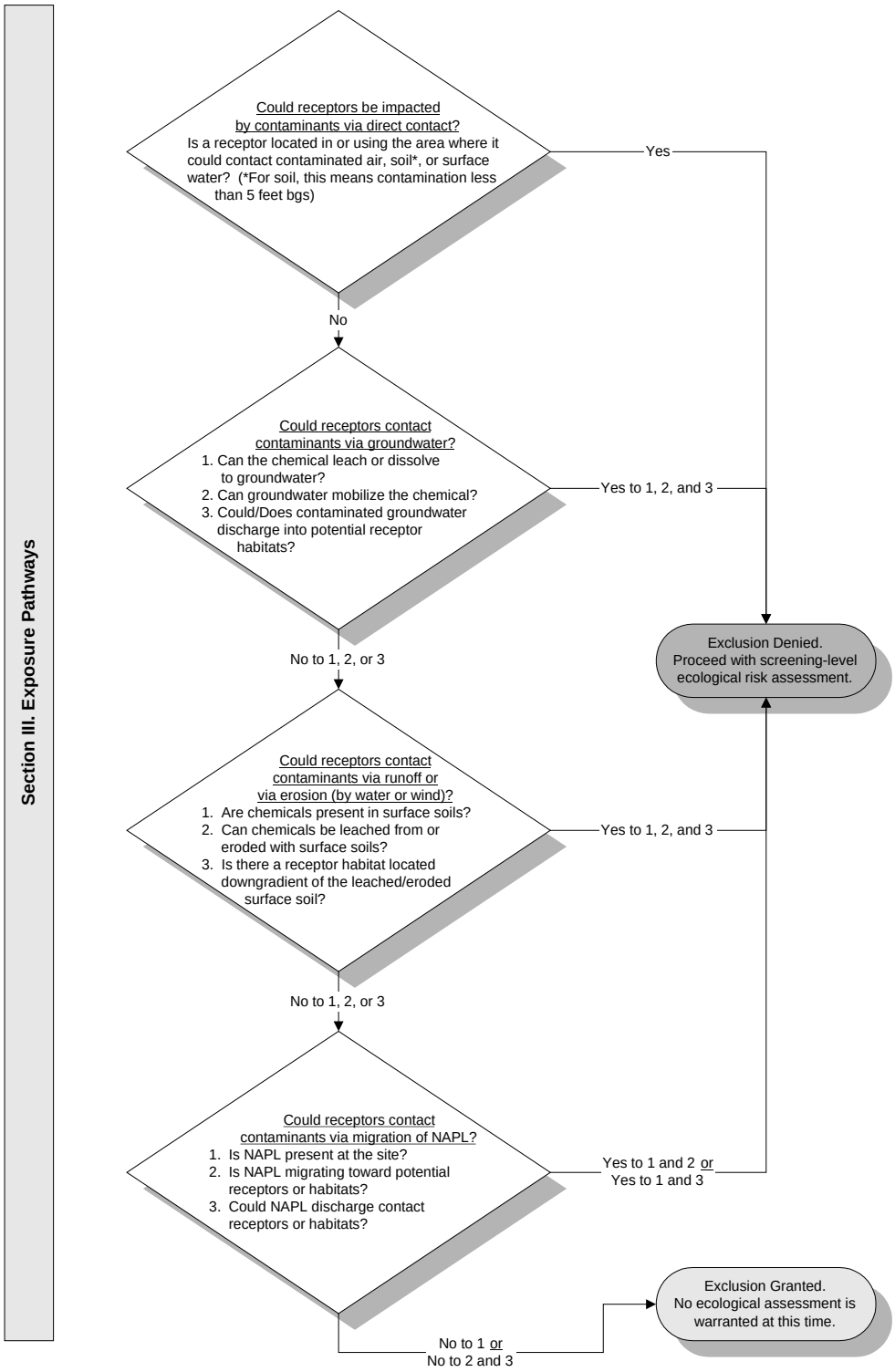


Figure 1 - Exclusion Criteria Decision Tree (continued)



Lead (mg/kg)	d_Lead (mg/kg)
0.97	0
80.4	1
2.3	1
2.3	1
2.9	1

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	input.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lead (mg/kg)

General Statistics

Number of Valid Data	5	Number of Detected Data	4
Number of Distinct Detected Data	3	Number of Non-Detect Data	1
		Percent Non-Detects	20.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	2.3	Minimum Detected	0.833
Maximum Detected	80.4	Maximum Detected	4.387
Mean of Detected	21.98	Mean of Detected	1.779
SD of Detected	38.95	SD of Detected	1.742
Minimum Non-Detect	0.97	Minimum Non-Detect	-0.0305
Maximum Non-Detect	0.97	Maximum Non-Detect	-0.0305

Warning: There are only 3 Distinct Detected Values in this data set
The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.635	Shapiro Wilk Test Statistic	0.676
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data not Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	17.68	Mean	1.279
SD	35.07	SD	1.878
95% DL/2 (t) UCL	51.12	95% H-Stat (DL/2) UCL	84070
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	12.73	Mean in Log Scale	0.983
SD	36.5	SD in Log Scale	2.334
95% MLE (t) UCL	47.52	Mean in Original Scale	17.6
95% MLE (Tiku) UCL	46.87	SD in Original Scale	35.12
		95% t UCL	51.09
		95% Percentile Bootstrap UCL	48.72
		95% BCA Bootstrap UCL	49.16
		95% H UCL	13725316

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.288	**Data do not follow a Discernable Distribution (0.05)**	
Theta Star	76.21		
nu star	2.307		
A-D Test Statistic	0.872	**Nonparametric Statistics**	
5% A-D Critical Value	0.682	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.682	Mean	18.04
5% K-S Critical Value	0.411	SD	31.18
Data not Gamma Distributed at 5% Significance Level		SE of Mean	16.1
		95% KM (t) UCL	52.37
Assuming Gamma Distribution		95% KM (z) UCL	44.52
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	51.28
Minimum	0.000001	95% KM (bootstrap t) UCL	2114
Maximum	80.4	95% KM (BCA) UCL	49.16
Mean	17.58	95% KM (Percentile Bootstrap) UCL	49.16
Median	2.3	95% KM (Chebyshev) UCL	88.23
SD	35.13	97.5% KM (Chebyshev) UCL	118.6
k star	0.205	99% KM (Chebyshev) UCL	178.3
Theta star	85.93		
Nu star	2.046	**Potential UCLs to Use**	
AppChi2	0.157	99% KM (Chebyshev) UCL	178.3
95% Gamma Approximate UCL (Use when n >= 40)	229.1		
95% Adjusted Gamma UCL (Use when n < 40)	N/A		

Warning: Recommended UCL exceeds the maximum observation

Note: DL/2 is not a recommended method.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

Analyte		Sample Number	OTC538-IS-0001-062912		OTC538-IS-0004-062912		OTC538-IS-0006-062912		OTC538-IS-0008-062912		OTC538-IS-0010-062912	
		Sample Date	6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
		Location	STA 1		STA 2		STA 3		MW-01 (STA 4)		MW-01 (STA 4)	
		Depth (ft bgs)	3 - 5		7 - 9		3 - 5		3 - 5		0 - 2	
	Background Values - Soil (mg/kg)[a]	**LANL (2012) ESLs (mg/kg)[b]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	**82.2**		**90.4**		**87.7**		**87.1**		**88.6**	
METALS (mg/kg)												
ALUMINUM	13722	pH Dependent	1590		8990		4140		6200		6110	
ARSENIC	3.7	6.8 / 68	0.97	U	2.2	J	1	J	1.1	J	1.8	J
BARIUM	169.3	110 / 260	21.2	J	71.9		33.4	J	54.5	J	108	
CALCIUM	317332	NSV	258000		169000		171000		234000		181000	
CHROMIUM	25	28 / 280	1.3	J	8.2		3.7	J	5.4	J	4.8	
COBALT	7.7	13 / 130	1.1	J	3	J	1.4	J	1.9	J	1.8	J
COPPER	13	15 / 46	1.2	J	7.4	J	3	J	3.3	J	4.1	J
IRON	23049	NSV	1320		8010		3590		5250		4850	
LEAD	10.9	14 / 28	0.97	U	80.4		2.3	J	2.3	J	2.9	J
MAGNESIUM	16991	NSV	2940		5820		2790		1950	J	2500	
MANGANESE	393	220 / 1,100	29.1		187		84.9		108		76.3	
NICKEL	17.4	9.7 / 19	1.8	J	6.6	J	3.3	J	4.4	J	4.2	J
POTASSIUM	5077	NSV	450	J	2290	J	1040	J	1440	J	1270	J
SODIUM	5196	NSV	1020	J	390	U	454	J	600	U	747	J
VANADIUM	42.6	0.025 / 0.25	6.6	J	14.3	J	7.6	J	12.5	J	10.3	J
ZINC	54.6	48 / 480	4.8	U	42.7		11.8		16.8		14.2	
PETROLEUM HYDROCARBONS (mg/kg)												
OIL RANGE ORGANICS C28-C40	NE	NSV	4.1	U	8.39	J	3.8	U	3.8	U	3.7	U

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1201 (OT-C538) RFI Report
Holloman Air Force Base, New Mexico

LANL (2012) ESL values represented as: No-Effect ESL / Low-Effect ESL (e.g., 6.8 / 68 for arsenic)

LANL (2012) ESL Exceeded

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] Los Alamos National Laboratory (LANL), 2012, ECORISK Database, LA-UR-12-24548, Release 3.1, October.

dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Final
RCRA Facility Investigation Report
Group 1 – Building 1221 (OT-C539)
Holloman Air Force Base, New Mexico

Prepared for U.S. Air Force Civil Engineer Center
2261 Hughes Ave., Suite 155
Lackland Air Force Base, Texas 78236-9861

Prepared by Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

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Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)

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Acronyms and Abbreviations

AFB	Air Force Base
bgs	below ground surface
COPC	chemical of potential concern
DPT	direct push technology
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
ft	foot/feet
GPR	ground-penetrating radar
GRO	gasoline range organics
HI	hazard index
IDW	investigation-derived waste
MDL	method detection limit
µg/L	micrograms per liter
m^3/kg	cubic meters per kilogram
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
ORO	oil range organics
PCB	polychlorinated biphenyl
PEF	particulate emission factor
PPRTV	Provisional Peer Reviewed Toxicity Values
RCRA	Resource Conservation and Recovery Act
RfD	reference dose
RFI	RCRA Facility Investigation
RSL	Regional Screening Level
Shaw	Shaw Environmental & Infrastructure, Inc. (a CB&I Company)
SSL	soil screening level
SVOC	semivolatile organic compound
TAL	target analyte list
TDS	total dissolved solids
TPH	total petroleum hydrocarbons
UCL	upper confidence limit
VOC	volatile organic compound
WQS	water quality standards

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1.0 INTRODUCTION

Shaw Environmental & Infrastructure, Inc. (Shaw), a CB&I company, has prepared this Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for the Air Force Civil Engineer Center (formerly the Air Force Center for Engineering and the Environment) under Contract No. FA8903-09-D-8580, Task Order No. 0013, Modification 01. Results presented in this report are from the investigation of the abandoned septic tank located at Building 1221 (OT-C539) at Holloman Air Force Base (AFB), New Mexico, which was one of the fifteen Group 1 septic tank sites under the Midwestern Region Performance-Based Remediation Contract. This RFI Report has been prepared pursuant to the requirements of the Holloman AFB Hazardous Waste Facility RCRA Permit No. NM6572124422 (the Permit) (New Mexico Environment Department [NMED], 2004). The purpose of this RFI was to delineate potential contamination that may have been released to the environment from the Building 1221 septic tank system.

Holloman AFB is situated in south-central New Mexico in the northwest central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). The 15 Group 1 former septic tank sites are located throughout Holloman AFB (Figure 1-2). Each former septic tank is associated with a specific building and is named in reference to the building, along with a numerical identification. As such, the 15 Group 1 septic tank systems are the following: OT-C530 (Building 308), OT-C531 (Buildings 920, 921, and 922), OT-C532 (Building 924), OT-C533 (Building 1190), OT-C534 (Building 1194), OT-C535 (Building 1196), OT-C536 (Building 1199), OT-C537 (Building 1200), OT-C538 (Building 1201), OT-C539 (Building 1221), OT-C540 (Building 1251), OT-C541 (Building 1269), OT-C542 (Building 1166), OT-C543 (Building 1175), and OT-C544 (Building 1176). This report presents a summary of the RFI work conducted at abandoned septic tank OT-C539 at Building 1221.

Building 1221, located in the Ammunition Depot, was constructed in 1983 for ammunition storage and was later used to store inert munitions. The *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) report in Appendix A indicates that the building contained a toilet, urinal, lavatory, and janitorial sink. The septic tank was abandoned in place in January 2008 by opening the tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill (North Wind, Inc., 2008, also included in Appendix A).

1.1 Purpose of the Investigation

Investigative activities were undertaken at Holloman AFB to determine the nature and extent of contamination and propose recommendations for either closure or additional corrective action, if necessary, at fifteen inactive, abandoned or removed septic tank systems, following

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the general guidance for closing septic systems found in 20.7.3.307 New Mexico Administrative Code (NMAC) Standards – Abandoned Sewers and On-Site Liquid Waste Systems.

Project quality objectives for each septic tank site consisted of the following:

- Gather and review all site historical information
- Identify septic tank components and historical uses
- Remove septic tank contents and contaminated soil (where necessary), and abandon the tank (where necessary)
- Determine the nature and extent of residual constituents of concern at each site, including potential pathways to groundwater
- Evaluate the risk at each site
- Develop conclusions and recommendations for each site.

This RFI Report presents the data collected to meet these project quality objectives at the Building 1221 abandoned septic tank.

1.2 Scope of Activities

This RFI Report describes all activities associated with the septic tank investigation at Building 1221, including site layout, soil sampling, soil analysis, as-built pipe mapping, and site boundary survey. All work was performed in accordance with the Holloman AFB *Basewide Septic Tank Solid Waste Management Unit RFI Work Plan* (USACE, 2010) and the *Quality Program Plan* (Shaw, 2012a). The *Quality Program Plan* (Shaw, 2012a) contains the Site Safety and Health Plan; the Uniform Federal Policy–Sampling and Analysis Plan/Quality Assurance Project Plan; and the Construction Quality Plan, which defines the methodology and practices used to control construction work during the performance of the RFI.

1.3 Regulatory Setting

The Permit (NMED, 2004) established the general and specific standards and activities for managing hazardous waste pursuant to Subtitle C of RCRA, the New Mexico Hazardous Waste Act, and the New Mexico Hazardous Waste Management Regulations. The Permit also set forth requirements for investigation, notification, corrective action, and reporting for the storage, management, and releases of hazardous wastes.

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The 15 septic systems were either inactive, abandoned, or previously removed as indicated in *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) report (Appendix A), and were not listed in the Permit (NMED, 2004). The Holloman AFB *RFI Work Plan* (USACE, 2010) was approved by NMED in a letter dated January 13, 2010 (NMED, 2010). The NMED-approved *RFI Work Plan* (USACE, 2010) contained investigation activities only; therefore Shaw submitted a Voluntary Corrective Measure Request (Shaw, 2012b) to include remediation and closure tasks that address septic system abandonment using 20.7.3.307 NMAC (Abandoned Sewers and On-Site Liquid Waste Systems). NMED has primary regulatory responsibility for the septic system sites; therefore corrective action must be performed under Title 20 NMAC.

The septic tank investigations were based on action/cleanup levels stipulated in Appendix 4-F of the Permit to be protective of human health and the environment. Permit Appendix 4-F specifies that soil contaminant concentrations be compared with the NMED residential soil screening levels (SSL), as presented in the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a), or the U.S. Environmental Protection Agency (EPA) Regional Screening Levels (RSLs) as presented in the *U.S. Environmental Protection Agency (EPA) Regions 3, 6, and 9 Regional Screening Levels for Chemical Contaminants at Superfund Sites* (EPA, 2012a), if no NMED SSL has been established. Holloman AFB also has NMED-approved background concentrations for metals in soil (NMED, 2012b).

For groundwater, the Permit specifies that the more stringent of either the New Mexico Water Quality Control Commission (NMWQCC) water quality standards (WQS) (20.6.2 NMAC), or the EPA drinking water maximum contaminant levels, be used for comparison with measured sample concentrations (EPA, 2012b).

1.4 RFI Report Organization

This RFI Report is organized into the following sections:

- **Section 1.0, Introduction**: identifies the objectives and purpose of this report.
- **Section 2.0, Environmental Setting**: provides pertinent descriptions of history, location, physiography, topography, surface water, hydrology, regional geology, soil types, regional hydrogeology, climate, current and future land use, and current and future water use for Holloman AFB.
- **Section 3.0, Source Characterization**: describes the data collection techniques and locations, as well as analytical methods.

- **Section 4.0, Investigation Results and Evaluation**: presents the soil analytical results, and provides the human health risk evaluation.
- **Section 5.0, Data Quality Assurance and Data Quality Control Review**: summarizes the analytical data validation results.
- **Section 6.0, Conclusions and Recommendations**: presents the conclusions and recommendations of this RFI report.
- **Section 7.0, References**: lists the references cited in this report.

In addition to the figures and tables listed in the table of contents, the following appendices are included in this report:

- **Appendix A** – Historical Records
- **Appendix B** – Geophysical Report
- **Appendix C** – Sample Collection Logs
- **Appendix D** – Boring Logs
- **Appendix E** – Site Survey Data
- **Appendix F** – Laboratory Analytical Data and Data Validation Checklists
- **Appendix G** – Waste Manifests
- **Appendix H** – Risk Evaluation Calculations.

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2.0 ENVIRONMENTAL SETTING

This section provides background information for Holloman AFB including physical setting, history, topography, climate, soils, geology, hydrology, and land and water use.

2.1 Physical Setting

Holloman AFB is situated in south-central New Mexico, in the northwest-central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). Holloman AFB has a population of 6,000, and occupies 59,639 acres in the northeast quarter of Section 1, Township 17 South, Range 8 East. The White Sands Missile Range testing facilities occupy additional land extending northward from the base. Privately- and publicly-owned lands border the remainder of Holloman AFB. The major highway servicing Holloman AFB is Highway 70, which runs southwest from the town of Alamogordo, New Mexico, and separates Holloman AFB from publicly owned lands to the south. Alamogordo, New Mexico which has a population of 30,401 according to the 2010 U.S. Census, is located approximately 7 miles east of the base.

2.2 Holloman Air Force Base History

Holloman AFB was first established in 1942 as Alamogordo Army Air Field. From 1942 through 1945, Alamogordo Army Air Field served as the training grounds for over 20 different flight groups, flying primarily B-17s, B-24s, and B-29s. After World War II, most operations had ceased at the base. In 1947, Air Material Command announced the air field would be its primary site for the testing and development of unmanned aircraft, guided missiles, and other research programs. On January 13, 1948, the Alamogordo installation was renamed in honor of the late Colonel George V. Holloman, a pioneer in guided missile research. In 1968, the 49th Tactical Fighter Wing arrived at Holloman AFB, and has remained since. Today, Holloman AFB also serves as the training center for the German Air Force's Tactical Training Center.

2.3 Physiography and Topography

Holloman AFB is located within the Sacramento Mountains physiographic province on the western edge of the Sacramento Mountains. The base is approximately 59,600 acres in area, and is located at a mean elevation of 4,093 feet (ft) above mean sea level. The region is characterized by high tablelands with rolling summit plains; cuesta-formed mountains dipping eastward; and west-facing escarpments, with the wide bracketed basin forming the basin and range complex. Holloman AFB is located in the Tularosa Basin, which is part of the Central Closed Basins. The bordering mountains rise abruptly to altitudes of 7,000 to 12,000 ft above mean sea level. The San Andres Mountains bound the basin to the west

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(approximately 30 miles) with the Sacramento Mountains approximately 10 miles to the east (Figure 2-1). At its widest, the basin is approximately 60 miles east to west, and stretches approximately 150 miles north to south.

2.4 Climate

As a whole, New Mexico has a mild, arid to semiarid continental climate characterized by light precipitation totals, abundant sunshine, relatively low humidity, and relatively large annual and diurnal temperature ranges (Western Regional Climate Center, 2013). The climate of the Central Closed Basins varies with elevation. The base is located in the low areas and is characterized by warm temperatures and dry air. Daytime temperatures often exceed 100 degrees Fahrenheit in the summer months, and are in the middle 50s degrees Fahrenheit in the winter. A preponderance of clear skies and relatively low humidity permits rapid nighttime cooling resulting in average diurnal temperature ranges of 25 to 35 degrees Fahrenheit. Potential evapotranspiration, at 67 inches per year, significantly exceeds annual precipitation, usually less than 15 inches. Arid conditions resulting from very low rainfall amounts, coupled with the topographically induced wind patterns combining with the sparse vegetation, tend to cause localized “dust devils.” The annual rainfall for Alamogordo, New Mexico is 12 inches per year. Much of the precipitation falls during the midsummer monsoonal period (July and August) as brief, yet frequent, intense thunderstorms culminating in 30 to 40 percent of the total annual rainfall.

2.5 Regional Geology and Soils

2.5.1 Geology

The sedimentary rocks that make up the adjacent mountain ranges are between 250 and 500 million years old (New Mexico Bureau of Geology and Mineral Resources, 2012). During the period when the area was submerged beneath the shallow intracontinental sea, the layers of limestone, shale, gypsum, and sandstone were formed. In time, these layers were pushed upward through various tectonic forces forming a large bulge on the surface. Approximately 10 million years ago, the center began to subside resulting in a vertical drop of thousands of feet, leaving the edges still standing (the present-day Sacramento and San Andres mountain ranges). In the millions of years following, rainfall, snowmelt, and wind eroded the mountain sediments depositing them in the valley (i.e., Tularosa Basin). Water carrying eroded limestone, dolomite, gravel, and other materials continue to flow into the basin.

As the Tularosa Basin is a bolson, which is a basin with no surface drainage outlet, sediments carried by surface water into a closed basin are bolson deposits. The overlying alluvium generally consists of unconsolidated gravels, sands, and clays. Soils in the basin are derived from the adjacent ranges as erosional deposits of limestone, dolomite, and gypsum. A fining

sequence from the ranges towards the basin's center characterizes the area with the near-surface soils as alluvial, eolian, and lacustrine deposits. The alluvial fan deposits are laterally discontinuous units of interbedded sand, silt, and clay while the eolian deposits consist primarily of gypsum sands. The eolian and alluvial deposits are usually indistinguishable due to the reworking of the alluvial sediment by eolian processes. The playa, or lacustrine deposits, consist of clay containing gypsum and are contiguous with the alluvial fan and eolian deposits throughout the base. Stiff caliche layers, varying in thickness, have been identified at different areas of the base.

2.5.2 Soils

The U.S. Natural Resources Conservation Service (formerly the Soil Conservation Service) has identified two soil associations in the vicinity of Holloman AFB: (1) the Holloman-Gypsum Land-Yesum Complex, and (2) the Mead silty clay loam (Figure 2-2) (U.S. Department of Agriculture, 1981). The permeability of these horizons ranges from 4×10^{-4} to 1×10^{-3} centimeters per second.

The Holloman-Gypsum Land-Yesum Complex, 0 to 5 percent sloped soil, consists of larger areas of shallow and deep, well-drained soils and areas of exposed gypsum. The Holloman soil makes up approximately 35 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 13 inches of the substratum is pink, very fine sandy loam that is very high in gypsum. Below that, the substratum is white gypsum to a depth of more than 60 inches. This soil is calcareous and mildly alkaline to moderately alkaline. Permeability is moderate. Available water capacity is very low.

Gypsum Land makes up approximately 30 percent of the Holloman-Gypsum Land-Yesum Complex (0 to 5 percent slopes). Typically, less than 1 inch of very fine sandy loam overlies soft to hard, white gypsum. The deep Yesum consists of very fine sandy loam that makes up approximately 20 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 9 inches of the substratum is light brown, fine sandy loam that is very high in gypsum. Below that, the substratum is pink, very fine sandy loam to a depth of more than 60 inches. The soil is calcareous throughout, and is mildly alkaline. Permeability is moderate. Available water capacity is moderate. Many fine gypsum crystals are found throughout the profile.

The soil type found across the main drainage area for the installation is Mead silty clay loam, 0 to 1 percent slopes. This deep, poorly drained, nearly level soil is on outer fringes of alluvial fans. This soil formed in fine textured alluvium over lacustrine lake sediment. It is very high in salt content because of periodic flooding and poor drainage. Slopes are smooth and concave. Typically, the surface layer is reddish brown, silty clay loam, and clay loam

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approximately 5 inches thick. The substratum, to a depth of 48 inches, is light reddish brown clay that has a high content of salt. Below that, the substratum is lacustrine material of variable texture and color to a depth of more than 60 inches. Included within this soil are areas of Holloman soils and Gypsum Land along the margins of the unit of steep, short gully sides and knolls. These inclusions make up approximately 15 percent of the map unit for this soil type. Individual areas are generally smaller than 10 acres. This soil is moderately calcareous throughout and is moderately to strongly alkaline. It has a layer of salt that is more soluble than gypsum. Permeability is very low. Available water capacity is low (USACE, 2010).

2.6 Regional Hydrogeology

Groundwater occurs as an unconfined aquifer in the unconsolidated deposits of the central basin, with the primary source of recharge as rainfall percolation and minor amounts of stream runoff along the western edge of the Sacramento Mountains. Surface water/rainfall migrates downward into the alluvial sediments at the edge of the shallow aquifer near the ranges and flows through progressively finer-grained sediments towards the central basin. Because the Tularosa Basin is a closed system, water that enters the area leaves either through evaporation or percolation. This elevated amount of percolation results in a fairly high water table. Beneath Holloman AFB, groundwater ranges from 5 to 50 ft below ground surface (bgs). Flow for the base is generally towards the southwest with localized influences from the variations in the topography of the base (Figure 2-3). In the northern and western portions of the base, groundwater flows more to the west towards the Ritas Draw, Malone Draw, and Lost River drainages. Groundwater flow is affected by local topography in areas immediately adjacent to arroyos, where groundwater flows directly toward the drainages regardless of the regional flow pattern.

Groundwater in the Tularosa Basin is of potable quality at the recharge areas in close proximity to the Sacramento Mountains and becomes increasingly mineralized toward the central portion of the basin and discharge areas. The majority (over 70 percent) of the Environmental Restoration Program sites located across Holloman AFB have groundwater monitoring wells containing water with an average total dissolved solids (TDS) concentration greater than 10,000 milligrams per liter (mg/L). These TDS data support the hypothesis that TDS concentrations below 10,000 mg/L at Holloman AFB are caused by dilution of natural groundwater quality from leaking water lines and surface irrigation from the domestic water supply. TDS concentrations greater than 10,000 mg/L exceed the NMWQCC limit as potable water (20.6.2 NMAC), and thus, the groundwater beneath Holloman AFB has been designated as unfit for human consumption. Likewise, the EPA guidelines have identified the groundwater as a Class IIIB water source, characterized by TDS concentrations exceeding 10,000 mg/L, and is characterized by a low degree of

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interconnection with adjacent surface water or groundwater of a higher class. Groundwater does not discharge or connect to any adjacent aquifers, because the Tularosa Basin is a closed basin. Adjacent surface waters include Lost River and Lake Holloman, which also have high concentrations of TDS, and are not considered potential drinking water sources.

2.7 Surface Water and Hydrology

The Tularosa Basin contains all of the surface flow in its boundaries. The nearest inflow of surface waters to Holloman AFB comes from the Lost River, located in the north-central region of the base. The upper reaches of the Three Rivers and the Sacramento River are perennial in the basin. Holloman AFB is dissected by several southwest-trending arroyos that control the surface drainage. Hay Draw arroyo is located in the far north. Malone and Ritas Draws, which drain into the Lost River and Dillard Draw arroyos, are located along the eastern perimeter of the base. Approximately 10,000 years ago, indications are that a much wetter climate existed. The present-day Lake Otero encompassed a much larger area, possibly upwards of several hundred square miles. Its remains are the Alkali Flat and Lake Lucero. Lake Lucero is a temporary feature of merely a few inches in depth during the rainy season.

Ancient lakes and streams deposited water-bearing deposits over the older bedrock basement materials. Fractures, cracks, and fissures in the Permian and Pennsylvanian bedrock yield small quantities of relatively good-quality water in the deeper peripheral. Potable water is only found from wells near the edges of the basin, with more saline water towards the center. Two of the principal sources of potable water are: (1) a long narrow area on the upslope sides of Tularosa and Alamogordo, and (2) in the far southwestern part of the basin. A portion of the city of Alamogordo's water, as well as Holloman AFB's water, is supplied from Bonito Lake (which is in the Pecos River Basin).

2.8 Current and Future Land Use

The land surrounding Holloman AFB consists of residential areas to the east and northeast (city of Alamogordo), rangeland to the south, the White Sands National Monument to the west, and areas where military activities are conducted to the north. The desert terrain of the area immediately surrounding Holloman AFB has limited development, and there are no agricultural operations, residential communities, or large industrial operations located adjacent to the base. The Boles Well Field, a freshwater source for Holloman AFB, is located approximately 6 miles to the southeast of the base. Holloman AFB is an active military installation and is expected to remain active for the foreseeable future. No transfer of military property to the public is anticipated, and public access to the base is restricted. Future land use is not expected to differ significantly from current land use practices (Foster Wheeler Environmental Corporation, 2002).

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2.9 Current and Future Water Use

At present, Holloman AFB receives approximately 50 percent of its freshwater supply from the Boles Well Field. An additional freshwater resource for Holloman AFB, and for the city of Alamogordo, is Bonito Lake, located 60 miles northeast of the Tularosa Basin. Currently, there are no potable supplies of groundwater or surface water located on the base because of poor groundwater quality with TDS concentrations greater than 10,000 mg/L.

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3.0 SOURCE CHARACTERIZATION

This section presents the overall technical approach in general accordance with the *RFI Work Plan* (USACE, 2010) (except where otherwise noted) and details the investigative and remediation activities that were implemented at Building 1221.

The primary environmental media of concern at Building 1221 are soil and groundwater. The extent of contamination in soil was expected to be relatively local to the abandoned septic tank location. Therefore, the basic approach was to identify the abandoned septic tank location and then work outward from the location in identifying contaminated soil. To evaluate the potential impacts to groundwater, a monitoring well was planned for installation in the leach field of each inactive, abandoned, or removed septic tank. The analytical programs for both soil and groundwater focused on the expected nature of contamination likely to be associated with septic tank discharges.

The RFI conducted at abandoned septic tank OT-C539 (Building 1221) was initiated as part of the Midwestern Region Performance-Based Remediation Contract. The *RFI Work Plan* (USACE, 2010) for this site included the following field work activities: pre-mobilization and mobilization/site setup activities, soil boring advancement, soil sample collection, soil sample analysis, investigation-derived waste (IDW) management; and land surveying. The Ammunition Depot is a secure area and photography is not permitted; therefore, photographs documenting field activities at Building 1221 are not available.

3.1 Pre-mobilization/Mobilization Activities

Several pre-investigation documents were filed and approvals obtained, as follows:

- Civil Engineer Work Request (Air Force Form 332) approval
- Base digging permits (Air Force Form 103, Base Civil Engineering Work Clearance Request) with utility clearances
- Site security clearances
- Facility manager notification of the intended operations.

Before the start of activities, a pre-investigation kick-off meeting and site walk-through were conducted with the Air Force Civil Engineer Center resident engineer, Holloman AFB personnel, and Shaw's Construction Manager, to plan for equipment access, equipment staging, decontamination area layout, potential site hazards, emergency evacuation routes, and project schedule.

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Prior to the submittal of the base digging permits, the drilling locations were delineated using marker flags, stakes, and paint. Utility clearance approvals were completed by the appropriate Holloman AFB utility office (i.e., telephone, sewer, water, natural gas, etc.), and by the New Mexico One Call utility clearance system. Upon receipt of the approved digging permit and utility clearances, Shaw's Construction Manager completed a site walk-through to confirm the utility and intrusive work locations. In addition, Shaw performed a site survey prior to the start of drilling activities to search for signs of other buried or overhead utilities.

3.2 Geophysical Investigation

A geophysical investigation was performed at Building 1221 in an attempt to define the limits of the abandoned septic system. Methods employed included: visual inspection, electromagnetic induction conductivity detection, ground-penetrating radar (GPR), and electromagnetic pipe and cable location.

Electromagnetic induction conductivity detection ground induction methods are employed to detect broad metal mass anomalies or conductive zones that may be indicative of potential septic tanks, and lateral changes in conductive zones of soil or backfill materials relative to native soil. GPR is used to detect abandoned septic tank excavation sidewalls and fill areas. An electromagnetic pipe and cable survey was conducted to detect buried utility lines.

Electromagnetic and GPR surveys were conducted at Building 1221 in June 2012. Influent piping and the location of the abandoned septic tank were identified. The location of the abandoned septic tank and leach field were identified approximately 50 ft west of Building 1221. The locations of the individual leach field piping could not be directly detected by the geophysical survey due to the similarity of composition of the clay pipes and the surrounding soil. However, the leach field could be identified by the geophysical survey equipment due to the differences in mineralization and conductivity between the native soil and the soils that were physically affected by normal leach field operation. The presence of the leach field piping was assumed within the leach field as identified by the geophysical survey which allowed for representative soil and groundwater sample collection. One buried utility line was identified near the west wall of the building, away from the investigation area. Geophysical findings are shown on Figure 3-1. The complete geophysical report is included in Appendix B.

3.3 Soil Investigation

The soil investigation of the abandoned septic tank at Building 1221 was conducted on June 29, 2012. The program consisted of sampling four borings advanced at the abandoned septic tank location, as shown on Figure 3-1. Soil boring OT-C539-Station 1 (sample numbers OTC539-IS-0001-062912 and OTC539-IS-0002-062912) was placed east of the

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abandoned septic tank along the influent line, OT-C539-Station 2 (sample numbers OTC539-IS-0003-062912 and OTC539-IS-0004-062912) was placed at the abandoned septic tank location, OT-C539-Station 3 (samples numbers OTC539-IS-0005-062912, OTC539-IS-0006-062912-FD, and OTC539-IS-0007-062912) was placed west of the abandoned septic tank near the effluent line, and OT-C539-Station 4 (sample numbers OTC539-IS-0008-062912 and OTC539-IS-0009-062912) was placed in the leach field of the abandoned septic tank. All borings were advanced using direct push technology (DPT), with soil samples collected at depths of 3 to 5 ft and 10 to 12 ft at OT-C539-Station 1; and 7 to 9 ft and 14 to 16 ft at OT-C539-Station 2; 3 to 5 ft and 10 to 12 ft at OT-C539-Station 3; and 3 to 5 ft and 10 to 12 ft at OT-C539-Station 4. A field duplicate was collected from the 3 to 5 ft depth at OT-C539-Station 3. Appendix C contains copies of the sample collection logs.

Soil samples were logged in the field in accordance with the Unified Soil Classification System requirements, and sample depths were in general accordance with the *RFI Work Plan* (USACE, 2010). Soil samples were not screened with a photoionization detector since there was no sensory evidence of contamination. Appendix D contains copies of the soil boring logs.

Soil samples for volatile organic compound (VOC) analysis were collected in accordance with EPA Method 5035, using a TerraCore® Sampler device (EPA, 1986), while non-VOC sample aliquots were placed in laboratory-provided containers. Samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), explosives, polychlorinated biphenyls (PCBs), target analyte list (TAL) metals, total petroleum hydrocarbons (TPH)-gasoline range organics (GRO), TPH-diesel range organics (DRO), TPH-oil range organics (ORO), cyanide, percent solids, and tritium by Accutest Laboratories, Inc., a National Environmental Laboratory Accreditation Program-accredited laboratory, using EPA analytical methods, as summarized on Table 3-1.

The excess sample core soil extracted using the DPT drilling method was placed in 55-gallon drums for later characterization and transport to a licensed disposal facility. The boreholes were abandoned upon completion by plugging from the bottom of the borehole to ground surface using bentonite pellets. Soil boring equipment was decontaminated between borings as detailed in Holloman AFB Standard Operating Procedure 2, “Sampling Equipment Decontamination” (located in Appendix B of the *RFI Work Plan* [USACE, 2010]) and Shaw’s Standard Operating Procedure No. EI-FS-014, “Decontamination of Contact Sampling Equipment.”

3.4 Groundwater Investigation

The groundwater investigation at the Building 1221 former septic tank location indicated no groundwater present in the any of the soil borings, including Station 4 in the former septic

tank leach field (the planned location for a groundwater monitoring well). As a result, a monitoring well was not installed, and groundwater sampling was not performed.

3.5 Investigation Derived Waste

The nonhazardous IDW generated during the RFI at Building 1221 (OT-C539) was segregated into the following categories:

- Soil – drill cuttings soil
- Water – decontamination liquids.

Upon generation, investigation derived waste was properly containerized and temporarily stored at the designated laydown yard, as specified by Holloman AFB. Wastes were contained in sealed, U.S. Department of Transportation–approved, steel 55-gallon drums (for soil cuttings and decontamination water), roll-off containers with liners and covers (for excavated waste soil), and a 1,400-gallon plastic tank (for waste water). The waste soil drums were emptied into 20-cubic yard roll-off containers, and the waste waters were pumped into a bulk plastic tank prior to characterization sampling and analysis for disposal. The drill cuttings from the Building 1221 Site were placed into the 20-cubic yard roll-off containers along with soils from other Holloman AFB investigation sites.

3.6 Site Surveying

Soil borings and other site features shown on Figure 3-1 were surveyed by Albuquerque Surveying Company, Inc. from Albuquerque, New Mexico, a state-licensed surveyor.

Horizontal coordinates are referenced to the North American Datum 1983 State Plane Coordinate System, New Mexico-Central, and surveyed to an accuracy of $\pm$1.0 ft. Vertical elevations are referenced to the North American Vertical Datum 1988 coordinate system to an accuracy of $\pm$0.01 ft. A copy of the survey results is presented in Appendix E.

3.7 Decontamination Procedures

A decontamination pad was constructed at the designated laydown area for decontamination of all downhole drilling equipment. The drilling rig was decontaminated prior to entering the site. Drilling equipment that came into contact with the borehole was decontaminated by hot-water pressure washing. Disposable equipment used for soil sample collection did not require decontamination.

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4.0 INVESTIGATION RESULTS AND EVALUATION

Soil analytical results presented in this section were used to delineate constituents of concern that may have been released to the environment, and confirm that no additional remedial measures are required.

4.1 Soil Analytical Results

DPT soil boring samples were collected during the Building 1221 RFI at the locations shown on Figure 3-1, and the data validation checklists for the soil sample data are provided in Appendix F.

The analytical results for metals in Table 4-1 show that Holloman AFB soil samples contain significant amounts of calcium, typically greater than 100,000 milligrams per kilogram (mg/kg) (10 percent), and can be as high as 250,000 mg/kg (25 percent). Calcium at these levels contributes spectral interferences during inductively-coupled plasma metals analysis, and can also clog the nebulizer that is used to introduce the sample. Sample dilution is the recommended method for solving both the spectral interference issue and the nebulizer clogging issue. However, sample dilution raises the analytical method detection limits (MDLs) for all associated metals, including thallium.

A typical method detection limit for thallium during inductively-coupled plasma analysis is 0.13 mg/kg. Diluting by a factor of 5 to 20 to eliminate calcium spectral interference and nebulizer clogging causes the thallium detection limit to be elevated by a factor of 5 to 20. This results in a MDL that is above the NMED residential SSL of 0.782 mg/kg thallium. Consequently, the required remedy to allow for proper equipment operation resulted in MDLs that were above the NMED residential SSL. However, thallium is not an element that is anticipated to be present at Building 1221 as a result of normal septic tank operation and maintenance.

The validated soil analytical results were compared with the NMED SSLs (NMED, 2012a), or the EPA RSLs (EPA, 2012a), if an NMED residential SSL was not established for a given analyte. In addition, a TPH screening level of 1,000 mg/kg was used to evaluate the laboratory analytical data. The 1,000 mg/kg action level for petroleum-contaminated soil is the Residential Direct Exposure Limit for unknown oil, listed in Table 6-2, TPH Screening Guidelines for Potable Groundwater, of the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a).

The thallium detection in OTC539-IS-0001-062912, 3 to 5 ft bgs (1.5 J mg/kg) exceeded the NMED residential SSL (0.782 mg/kg) and the Holloman AFB background value for thallium

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in soil (1.3 mg/kg). No other parameters had detections above the NMED residential SSL screening criteria in sample OTC539-IS-0001-062912, and all other samples met the NMED SSL criteria for all analytes. Likewise, all soil samples from all locations and depths had TPH-GRO, TPH-DRO, and TPH-ORO concentrations below the TPH screening level, and no tritium was detected in any of the soil samples.

The estimated thallium concentration of 1.5 J mg/kg for sample OTC539-IS-0001-062912 is equal to the method detection limit (MDL) of 1.5 mg/kg and is below the reporting limit of 5.8 mg/kg. An estimated result such as this is less accurate and less precise than a result reported above the MDL, and in this case the result is analytically equivalent to the Holloman AFB-established background value of 1.3 mg/kg. Therefore, it is believed that the estimated thallium concentration of 1.5 J mg/kg in this one soil sample is unlikely to be the result of contamination.

Zinc was detected in OTC539-IS-0007-062912 (OT-C539-Station 3, 10 to 12 ft bgs) at a concentration of 82.6 mg/kg which exceeds the Holloman AFB soil background value (54.6 mg/kg), but is below the NMED residential SSL screening criteria (23,500 mg/kg). No other soil detections exceeded the Holloman AFB soil background values.

4.2 Groundwater Analytical Results

The groundwater investigation at the Building 1221 former septic tank location indicated no groundwater present in the any of the soil borings, including Station 4 in the former septic tank leach field (the planned location for a groundwater monitoring well). As a result, a monitoring well was not installed, and groundwater sampling was not performed.

4.3 Investigation Derived Waste Analytical Results

A bulk waste characterization sample (LDY-IDW-01-090412) was collected from the bulk waste soil and analyzed for Toxicity Characteristic Leaching Procedure VOCs, SVOCs, and RCRA metals. The results are presented in Table 4-2. None of the waste soil analytical results were above the 40 Code of Federal Regulations Part 261.24 limits. The waste soil was managed as nonhazardous waste and was subsequently transported to Otero/Greentree Regional Landfill, Alamogordo, New Mexico for disposal (Waste Manifest in Appendix G-).

The wastewater from equipment decontamination was sampled and analyzed for VOCs, SVOCs, TAL metals, TPH-GRO, TPH-DRO, and TPH-ORO, with the analytical results presented in Table 4-3. The analytical results were reviewed by the Holloman AFB wastewater treatment plant personnel, and subsequently accepted for disposal.

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4.4 Risk-Based Evaluation

4.4.1 Soil

Nine soil samples, including one duplicate, were collected at Building 1221, from depths of 0 to 16 ft bgs, during the abandoned septic tank investigation. Per NMED (2012a), the soil depths of interest for a risk evaluation are 0 to 10 ft bgs for construction workers and residential receptors, and 0 to 1 ft bgs for commercial/industrial workers. Therefore, results from the screening assessment (Table 4-1) that present data for 0 to 10 ft bgs (four samples and one field duplicate) were used for the Risk Evaluation.

Based on the results of the initial screening evaluation for 0 to 10 ft bgs soil, one chemical had a maximum detected concentration greater than: (1) NMED residential SSLsor EPA residential RSLs (if NMED values have been established), and (2) site-specific background values. Total cancer risk ratios and total hazard ratios (hazard index [HI]) to address potential additive toxicological effects were also assessed (per NMED 2012a, Section 5.0). This was conducted by using maximum detected concentrations of carcinogens and non-carcinogens, estimating risk and hazard ratios, and scaling a total cancer risk and total HI. The total cancer risk was less than 1.0×10^{-5} (total cancer risk: 3.6×10^{-6}), but the total HI was greater than 1.0 (site HI: 2.2), as shown in Appendix H, with thallium contributing 87 percent of the total hazard. If thallium is excluded from the calculation, the HI would be less than 1.0 (Note: see the discussion below regarding the provisional toxicity assessment for thallium). Therefore, total cancer risks and non-cancer hazards were acceptable, except for thallium in soil, as further discussed in the following paragraphs).

The chemical of potential concern (COPC) in soil is as follows:

- Thallium.

Per the *RFI Work Plan* (USACE, 2010), for soil COPCs that are above the screening levels, an exposure model is required, including the following:

- Media of Concern
- Current and future receptors
- Complete and incomplete exposure pathways.

The media of concern is soil, and receptors could include current/future commercial/industrial workers, construction workers, and future residents. Complete exposure pathways for the receptors include ingestion of COPCs in soil, dermal contact with COPCs in soil, and inhalation of soil through particle mobilization via wind. Although VOCs in soil may migrate via vapor intrusion into indoor air or volatilize to ambient air and thus

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pose potential inhalation risks and/or hazards, no VOCs were selected as COPCs for soil at Building 1221 (OT-C539).

Per the *RFI Work Plan* (USACE, 2010), site-specific screening levels may be developed for all complete routes of exposure identified in the exposure model. NMED (2012a) presents soil exposure equations for residential exposure, as well as commercial/industrial workers and construction workers. Therefore, site-specific soil screening levels are developed for thallium for these receptor populations. EPA's on-line RSL tool was used to estimate these site-specific soil screening levels, relying on NMED-recommended default exposure parameters and toxicity values, when available.

Site-specific screening levels for thallium are listed as follows, with output from EPA's on-line calculator tool presented in Tables H-1 through H-3 in Appendix H:

- Screening Level for future resident: 0.782 mg/kg
- Screening Level for current/future commercial/industrial worker: 11.4 mg/kg
- Screening Level for current/future construction worker: 12.4 mg/kg.

It should be noted that the particulate emission factor (PEF) used by the on-line calculator for the construction worker (6.6×10^9 cubic meters per kilogram [m^3/kg]) is based on wind erosion, as this is the only PEF option available. However, NMED (2012a) recommends the use of an alternative PEF model based on dust emitted from construction vehicle traffic across a site for this receptor (with a PEF of 2.1×10^6 m^3/kg that is 318-fold different than the wind erosion PEF). As the air concentration is estimated by dividing the soil concentration by the PEF, a numerically smaller PEF results in a greater air concentration. However, as the construction worker screening level of 12.4 mg/kg for the COPC is based predominantly on the soil ingestion pathway (not the inhalation pathway) (Appendix H), this difference in PEF values is not considered significant.

Per the *RFI Work Plan* (USACE, 2010), a more representative site-specific exposure point concentration (EPC) should be compared with the site-specific screening levels previously determined. The EPC, based on the 95 percent upper confidence limit (UCL) of the mean, was attempted to be estimated using EPA's ProUCL statistical software, version 4.1.01 (EPA, 2010a). However, as only four soil analytical results are available for the COPC, ProUCL would not calculate an EPC, and gave the following warning statements:

> "Warning: This data set only has 4 observations. Data set is too small to compute reliable and meaningful statistics and estimates. The data set for variable thallium was not processed. It is suggested to collect at least 8 to 10

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observations before using these statistical methods. If possible, compute and collect Data Quality Objectives-based sample size and analytical results."

Therefore, a 95 percent UCL value was derived for the COPC (thallium) using a Bootstrap-t statistical program, described by Efron (1982) and discussed in EPA (1997). Non-detect values, if present, were represented in this Bootstrap-t program as random numbers between zero and the detection limit that were generated by the iterative process written into the program.

The Bootstrap-t method is a nonparametric method recommended by EPA for censored data and was used to calculate 95 percent UCLs for the COPC data sets when ProUCL would not run. Bootstrap 95 percent UCLs were calculated as follows (Efron and Tibshirani, 1993):

1. The data set was randomly resampled with replacement;
2. The arithmetic mean of the resampled data set was estimated;
3. Steps 1 and 2 were performed 2,000 times and created a new data set of 2,000 resampled means; and
4. The 95th percentile of the resampled mean data set created during Step 3 was selected.

Per Efron and Tibshirani (1993), the 95th percentile of the resampled mean data set is a good approximation of the 95 percent UCL on the mean of the original data set.

Using this Bootstrap method, the 95 percent UCL for thallium in soil (0-10 ft bgs) for the four soil samples (field duplicate was averaged with primary sample) is as follows (Table H-4 in Appendix H):

- Thallium 95 percent UCL: 1.38 mg/kg.

The 95 percent UCL of 1.38 mg/kg exceeds the risk based screening concentration of 0.782 mg/kg for potential future residential exposure.

It is important to note that the thallium toxicity value on which the site-specific screening levels are based is a provisional reference dose (RfD). Provisional Peer Reviewed Toxicity Values (PPRTVs) have a high degree of uncertainty. For this assessment, use of thallium provisional toxicity criteria was preferable to not evaluating the chemical. However, because provisional toxicity criteria have not been formally accepted by EPA, there is uncertainty with these types of toxicity values and, therefore, with the hazard-based site-specific screening concentration that were estimated for this metal.

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For thallium, the provisional chronic oral RfD of 1.0×10^{-5} mg/kg per day and subchronic oral RfD of 4.0×10^{-5} mg/kg per day are from an appendix to the Derivation Support Document dated October 2010 (EPA, 2010b), and the uncertainty associated with these RfDs is greater than usual, compared with other chemical PPRTVs. As stated in EPA (2010b), it was inappropriate to derive a provisional subchronic or chronic provisional-RfD for thallium. However, information was available that, although insufficient to support derivation of a provisional toxicity value under current guidelines, may be of limited use to risk assessors. In such cases, the Superfund Health Risk Technical Support Center summarizes available information in an appendix and develops a screening value. Users of screening toxicity values in an appendix to a PPRTV assessment should understand that there is considerably more uncertainty associated with the derivation of a supplemental screening toxicity value than for a value presented in the body of the PPRTV assessment. Therefore, the site-specific screening levels for thallium estimated for soil at Building 1221should be viewed as screening-level only, and should not be used for remedial action decisions.

Therefore, for the COPC thallium in soil, future residential exposure is a potential health risk, while current and/or future commercial/industrial worker and construction worker exposure scenarios are not a health risk.

4.4.2 Groundwater

The groundwater investigation at the Building 1221 former septic tank location indicated no groundwater present in the any of the soil borings, including Station 4 in the former septic tank leach field (the planned location for a groundwater monitoring well). As a result, a monitoring well was not installed, groundwater sampling was not performed, and a risk evaluation was not performed.

4.4.3 Risk-Based Conclusions

For the COPC thallium in soil, future residential exposure is a potential health risk, but not for current and/or future commercial/industrial worker, and current and/or future construction worker. However, the important uncertainties associated with the thallium toxicity values, as discussed previously, should be taken into account, and the site-specific screening levels for this COPC should not be used for remedial action decisions, as they are screening level only. Total cancer risks (discounting thallium) and total non-cancer hazards in soil were acceptable.

4.5 Ecological Evaluation

Building 1221 is located within the Ammunition Depot at Holloman AFB. The Ammunition Depot is an isolated facility containing ammunition storage bunkers and other features. Using the Ecological Site Exclusion Criteria Decision Tree (Attachment B to Volume 2 of *Risk*

Assessment Guidance for Investigations and Remediation; NMED, 2012), no sensitive areas exist at or adjacent to the septic system site, the site does not contain other land areas which could be considered viable ecological habitat, and the site does not contain any perennial or ephemeral aquatic features. Therefore, an ecological assessment is not warranted at this time.

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5.0 DATA QUALITY ASSURANCE AND DATA QUALITY CONTROL REVIEW

All analytical data were reviewed in accordance with EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA, 2004a) and the EPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (EPA, 2004b). Data qualifiers were added to the database prior to project use. The data tables provided in Section 4.0 show the data qualifiers added during data validation. Detailed data validation checklists for each data deliverable are provided in Appendix F.

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6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary and Conclusions

6.1.1 Soil

Nine soil samples were collected at various Holloman AFB Building 1221 locations during the abandoned septic tank investigation. The samples were analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium. Validated analytical results were compared with the NMED Residential SSLs, the NMED Residential Direct Exposure Limit for soil contaminated with unknown petroleum oil, and the Holloman AFB soil background values. One analyte, thallium, was detected above the New Mexico Residential Soil screening values at an estimated (J-flagged) concentration in one sample from one location. All other soil samples from all other locations and depths were non-detect or below their respective NMED Residential SSLs or NMED Residential Direct Exposure Limit.

The soil sample from a depth interval of 3.0 to 5.0 ft bgs in soil boring OT-C539-Station 1 (septic tank inlet line) had a thallium concentration of 1.5 J mg/kg, which was greater than the NMED SSL of 0.782 mg/kg and the Holloman AFB background level of 1.3 mg/kg. This estimated concentration of thallium of 1.5 J mg/kg for sample OTC539-IS-0001-062912 is equal to the MDL of 1.5 mg/kg, is analytically equivalent to the Holloman-established background value of 1.3 mg/kg, and is not be believed to be the result contamination.

The risk-based health screening concluded that, for the COPC selected in soil (thallium), future residential exposure is a potential health risk, but not for current and/or future commercial/industrial worker, and current and/or future construction worker. However, the important uncertainties associated with the thallium toxicity values, as discussed previously, should be taken into account, and the site-specific screening levels for this COPC should not be used for remedial action decisions, as they are screening level only.

The ecological evaluation concluded that ecological assessment is not warranted at this time because no sensitive areas exist at or adjacent to the septic system site, the site does not contain other land areas which could be considered viable ecological habitat, and the site does not contain any perennial or ephemeral aquatic features.

6.1.2 Groundwater

The groundwater investigation at the Building 1221 former septic tank location indicated no groundwater present in the any of the soil borings, including Station 4 in the former septic tank leach field (the planned location for a groundwater monitoring well). As a result, a

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monitoring well was not installed, groundwater was not sampled, and a risk-based health screening was not performed.

6.2 Recommendations

6.2.1 Soil

The risk-based evaluation concluded that exposure to the COPC thallium in soil is a potential health risk for a future residential scenario. This conclusion was based on one soil sample result that was an estimated (J-flagged) result equal to the MDL of 1.5 mg/kg. This estimated result is the analytical equivalent of the Holloman AFB background value for thallium of 1.3 mg/kg. Holloman AFB is an active military installation and is expected to remain active for the foreseeable future. Future land use is not expected to differ significantly from current land use practices. No transfer of military property to the public is anticipated, and public access to the base is restricted. Based on this information, no additional corrective action is recommended for the soil at Building 1221.

6.2.2 Groundwater

No groundwater was encountered during the subsurface investigation at this site. No additional corrective action is recommended for groundwater at Building 1221.

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7.0 REFERENCES

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Tables

Table 3-1
Sample Summary
Building 1221 (OT-C539) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C539-Station 1	682511.7704	1693518.1734	6/29/2012	Investigation Soil	3 - 5	OTC539-IS-0001-062912	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/29/2012	Investigation Soil	10 - 12	OTC539-IS-0002-062912	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OT-C539-Station 2	682518.0355	1693499.7618	6/29/2012	Investigation Soil	7 - 9	OTC539-IS-0003-062912	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/29/2012	Investigation Soil	14 - 16	OTC539-IS-0004-062912	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1221 (OT-C539) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C539-Station 3	682510.1318	1693494.7872	6/29/2012	Investigation Soil	3 - 5	OTC539-IS-0005-062912	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/29/2012	Investigation Soil - Field Duplicate	3 - 5	OTC539-IS-0006-062912-FD	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/29/2012	Investigation Soil	10 - 12	OTC539-IS-0007-062912	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OT-C539-Station 4	682492.2960	1693475.7957	6/29/2012	Investigation Soil	3 - 5	OTC539-IS-0008-062912	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/29/2012	Investigation Soil	10 - 12	OTC539-IS-0009-062912	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1221 (OT-C539) RFI Report
Holloman Air Force Base, New Mexico

Notes:

[a] Coordinates are in North American Datum, 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] EPA, 2007, Test Methods for Evaluating Soil Waste Physical/Chemical Methods, EPA Publication SW-846, Final Update IV. Available online at www.epa.gov/osw/hazard/testmethods/sw846.

Percent Solids and Total Dissolved Solids from *Standard Methods for the Examination of Water and Wastewater*, 19th edition, 1995.

bgs	Below ground surface.
DRO	Diesel range organics.
EPA	Environmental Protection Agency
FD	Field Duplicate.
ft	Feet/foot.
GRO	Gasoline range organics.
ORO	Oil range organics.
PCB	Polychlorinated Biphenyl.
RCRA	Resource Conservation and Recovery Act.
RFI	RCRA Facility Investigation.
SVOC	Semivolatile organic compound.
TAL	Target analyte list.
TPH	Total petroleum hydrocarbons.
VOC	Volatile organic compound.

Table 4-1
Soil Analytical Data
Building 1221 (OT-C539) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC539-IS-0001-062912		OTC539-IS-0002-062912		OTC539-IS-0003-062912		OTC539-IS-0004-062912		OTC539-IS-0005-062912		OTC539-IS-0006-062912-FD		OTC539-IS-0007-062912		OTC539-IS-0008-062912		OTC539-IS-0009-062912	
				Sample Date	6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location	OT-C539-Station 1 influent line to tank		OT-C539-Station 1 influent line to tank		OT-C539-Station 2 septic tank		OT-C539-Station 2 septic tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 4 leach field		OT-C539-Station 4 leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		3 - 5		10 - 12		3 - 5		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**85.1**		**87.6**		**89.5**		**88**		**84**		**84.3**		**88.3**		**87.4**		**87.4**	
VOLATILES (mg/kg)																						
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0011	U	0.001	U	0.001	U	0.0012	U	0.0013	U	0.0011	U	0.001	U	0.0011	U	0.001	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.0014	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0017	U	0.0016	U	0.0016	U	0.0019	U	0.002	U	0.0016	U	0.0016	U	0.0017	U	0.0016	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0011	U	0.001	U	0.001	U	0.0012	U	0.0013	U	0.0011	U	0.001	U	0.0011	U	0.001	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0011	U	0.001	U	0.001	U	0.0012	U	0.0013	U	0.0011	U	0.001	U	0.0011	U	0.001	U
1,1-DICHLOROETHENE	NE	240	449		0.0014	U	0.0013	U	0.0013	U	0.0015	U	0.0017	U	0.0013	U	0.0013	U	0.0014	U	0.0013	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0012	UJ	0.0011	U	0.0011	U	0.0013	U	0.0014	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0023	U	0.0021	U	0.0021	U	0.0025	U	0.0028	U	0.0022	U	0.0021	U	0.0022	U	0.0022	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.00099	U	0.00093	U	0.00092	U	0.0011	U	0.0012	U	0.00096	U	0.00091	U	0.00097	U	0.00095	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0011	UJ	0.001	U	0.001	U	0.0012	U	0.0013	U	0.0011	U	0.001	U	0.0011	U	0.001	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.00099	U	0.00093	U	0.00092	U	0.0011	U	0.0012	U	0.00096	U	0.00091	U	0.00097	U	0.00095	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.0014	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0012	UJ	0.0011	U	0.0011	U	0.0013	U	0.0014	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0011	UJ	0.001	U	0.001	U	0.0012	U	0.0013	U	0.0011	U	0.001	U	0.0011	U	0.001	U
2-HEXANONE	NE	210	NE		0.0053	U	0.005	U	0.005	U	0.0059	U	0.0065	U	0.0052	U	0.0049	U	0.0052	U	0.0051	U
ACETONE	NE	61000	66600		0.02	U	0.019	U	0.018	U	0.022	U	0.024	U	0.019	U	0.018	U	0.019	U	0.019	U
BENZENE	NE	1.1	15.4		0.0015	U	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0011	U	0.001	U	0.001	U	0.0012	U	0.0013	U	0.0011	U	0.001	U	0.0011	U	0.001	U
BROMOFORM	NE	62	616		0.0015	U	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U
BROMOMETHANE	NE	7.3	16.5		0.002	U	0.0019	U	0.0018	U	0.0022	U	0.0024	U	0.0019	U	0.0018	U	0.0019	U	0.0019	U
CARBON DISULFIDE	NE	820	1530		0.002	U	0.0019	U	0.0018	U	0.0022	U	0.0024	U	0.0019	U	0.0018	U	0.0019	U	0.0019	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0018	U	0.0017	U	0.0017	U	0.002	U	0.0022	U	0.0017	U	0.0016	U	0.0017	U	0.0017	U
CHLOROBENZENE	NE	290	376		0.00099	U	0.00093	U	0.00092	U	0.0011	U	0.0012	U	0.00096	U	0.00091	U	0.00097	U	0.00095	U
CHLOROETHANE	NE	15000	29800		0.002	U	0.0019	U	0.0018	U	0.0022	U	0.0024	U	0.0019	U	0.0018	U	0.0019	U	0.0019	U
CHLOROFORM	NE	0.29	5.86		0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.0014	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U
CHLOROMETHANE	NE	120	275		0.002	U	0.0019	U	0.0018	U	0.0022	U	0.0024	U	0.0019	U	0.0018	U	0.0019	U	0.0019	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0015	U	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.00099	U	0.00093	U	0.00092	U	0.0011	U	0.0012	U	0.00096	U	0.00091	U	0.00097	U	0.00095	U
CYCLOHEXANE	NE	7000	NE		0.0014	UJ	0.0013	U	0.0013	U	0.0015	U	0.0017	U	0.0013	U	0.0013	U	0.0014	U	0.0013	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.00099	U	0.00093	U	0.00092	U	0.0011	U	0.0012	U	0.00096	U	0.00091	U	0.00097	U	0.00095	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0015	U	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U
ETHYLBENZENE	NE	5.4	68.4		0.00099	U	0.00093	U	0.00092	U	0.0011	U	0.0012	U	0.00096	U	0.00091	U	0.00097	U	0.00095	U
ISOPROPYLBENZENE	NE	2100	2430		0.0011	U	0.001	U	0.001	U	0.0012	U	0.0013	U	0.0011	U	0.001	U	0.0011	U	0.001	U
METHYL ACETATE	NE	78000	78200		0.012	U	0.012	U	0.012	U	0.014	U	0.015	U	0.012	U	0.011	U	0.012	U	0.012	U
METHYL ETHYL KETONE	NE	28000	37100		0.006	U	0.0057	U	0.0056	U	0.0067	U	0.0074	U	0.0059	U	0.0056	U	0.0059	U	0.0058	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0054	U	0.0051	U	0.0051	U	0.006	U	0.0066	U	0.0053	U	0.005	U	0.0053	U	0.0052	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0013	UJ	0.0012	U	0.0012	U	0.0014	U	0.0016	U	0.0012	U	0.0012	U	0.0013	U	0.0012	U
METHYLENE CHLORIDE	NE	56	409		0.0045	U	0.0043	U	0.0042	U	0.005	U	0.0055	U	0.0044	U	0.0042	U	0.0045	U	0.0044	U

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Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC539-IS-0001-062912		OTC539-IS-0002-062912		OTC539-IS-0003-062912		OTC539-IS-0004-062912		OTC539-IS-0005-062912		OTC539-IS-0006-062912-FD		OTC539-IS-0007-062912		OTC539-IS-0008-062912		OTC539-IS-0009-062912	
				Sample Date	6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location	OT-C539-Station 1 influent line to tank		OT-C539-Station 1 influent line to tank		OT-C539-Station 2 septic tank		OT-C539-Station 2 septic tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 4 leach field		OT-C539-Station 4 leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		3 - 5		10 - 12		3 - 5		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																						
STYRENE	NE	6300	7280		0.0026	U	0.0024	U	0.0024	U	0.0029	U	0.0031	U	0.0025	U	0.0024	U	0.0025	U	0.0025	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.002	U	0.0019	U	0.0018	U	0.0022	U	0.0024	U	0.0019	U	0.0018	U	0.0019	U	0.0019	U
TETRACHLOROETHYLENE	NE	22	7.02		0.00099	U	0.00093	U	0.00092	U	0.0011	U	0.0012	U	0.00096	U	0.00091	U	0.00097	U	0.00095	U
TOLUENE	NE	5000	5270		0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.0014	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0015	U	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0011	U	0.001	U	0.001	U	0.0012	U	0.0013	U	0.0011	U	0.001	U	0.0011	U	0.001	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.0014	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.002	U	0.0019	U	0.0018	U	0.0022	U	0.0024	U	0.0019	U	0.0018	U	0.0019	U	0.0019	U
VINYL CHLORIDE	NE	0.06	0.728		0.0015	U	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U
XYLENES, TOTAL	NE	630	814		0.0032	UJ	0.003	U	0.003	U	0.0035	U	0.0039	U	0.0031	U	0.0029	U	0.0031	U	0.0031	U
SEMIVOLATILES (mg/kg)																						
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
2,4-DICHLOROPHENOL	NE	180	183		0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.026	U	0.024	U	0.023	U	0.024	U	0.025	U	0.025	U	0.024	U	0.024	U	0.024	U
2,4-DINITROPHENOL	NE	120	122		0.41	U	0.38	U	0.37	U	0.38	U	0.4	U	0.4	U	0.38	U	0.38	U	0.38	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
2,6-DINITROTOLUENE	NE	61	61.1		0.024	U	0.022	U	0.022	U	0.022	U	0.024	U	0.024	U	0.022	U	0.022	U	0.022	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U
2-CHLOROPHENOL	NE	390	391		0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
2-METHYLNAPHTHALENE	NE	230	NE		0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
2-METHYLPHENOL	NE	3100	NE		0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
2-NITROANILINE	NE	610	NE		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U
2-NITROPHENOL	NE	NE	NE		0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U
3-NITROANILINE	NE	NE	NE		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.083	U	0.076	U	0.074	U	0.076	U	0.08	U	0.08	U	0.076	U	0.076	U	0.075	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
4-CHLOROANILINE	NE	2.4	NE		0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
4-NITROANILINE	NE	24	NE		0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U
4-NITROPHENOL	NE	NE	NE		0.17	U	0.15	U	0.15	U	0.15	U	0.16	U	0.16	U	0.15	U	0.15	U	0.15	U
ACENAPHTHENE	NE	3400	3440		0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
ACENAPHTHYLENE	NE	NE	NE		0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
ACETOPHENONE	NE	7800	7820		0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
ANTHRACENE	NE	17000	17200		0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
ATRAZINE	NE	2.1	NE		0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U

Table 4-1
Soil Analytical Data
Building 1221 (OT-C539) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC539-IS-0001-062912		OTC539-IS-0002-062912		OTC539-IS-0003-062912		OTC539-IS-0004-062912		OTC539-IS-0005-062912		OTC539-IS-0006-062912-FD		OTC539-IS-0007-062912		OTC539-IS-0008-062912		OTC539-IS-0009-062912	
				Sample Date	6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location	OT-C539-Station 1 influent line to tank		OT-C539-Station 1 influent line to tank		OT-C539-Station 2 septic tank		OT-C539-Station 2 septic tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 4 leach field		OT-C539-Station 4 leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		3 - 5		10 - 12		3 - 5		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																						
BENZALDEHYDE	NE	7800	NE	0.21	U	0.19	U	0.18	U	0.19	U	0.2	U	0.2	U	0.19	U	0.19	U	0.19	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
BENZO(A)PYRENE	NE	0.015	0.148	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U
BIPHENYL	NE	51	57.1	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.083	U	0.076	U	0.074	U	0.076	U	0.08	U	0.08	U	0.076	U	0.076	U	0.075	U
CAPROLACTAM	NE	31000	NE	0.066	U	0.061	U	0.059	U	0.061	U	0.064	U	0.064	U	0.061	U	0.061	U	0.06	U
CARBAZOLE	NE	NE	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
CHRYSENE	NE	15	148	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
DIBENZOFURAN	NE	78	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
DIETHYL PHTHALATE	NE	49000	48900	0.083	U	0.076	U	0.074	U	0.076	U	0.08	U	0.08	U	0.076	U	0.076	U	0.075	U
DIMETHYL PHTHALATE	NE	611000	611000	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.083	U	0.076	U	0.074	U	0.076	U	0.08	U	0.08	U	0.076	U	0.076	U	0.075	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U
FLUORANTHENE	NE	2300	2290	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
FLUORENE	NE	2300	2290	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.091	U	0.083	U	0.081	U	0.084	U	0.088	U	0.088	U	0.083	U	0.083	U	0.083	U
HEXACHLOROETHANE	NE	12	42.8	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
ISOPHORONE	NE	510	5120	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
M,P-CRESOL	NE	NE	NE	0.03	U	0.027	U	0.026	U	0.027	U	0.029	U	0.029	U	0.027	U	0.027	U	0.027	U
NAPHTHALENE	NE	3.6	43.0	0.033	U	0.03	U	0.029	U	0.031	U	0.032	U	0.032	U	0.03	U	0.03	U	0.03	U
NITROBENZENE	NE	4.8	53.5	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.25	U	0.23	U	0.22	U	0.23	U	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
PHENANTHRENE	NE	1830	1830	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
PHENOL	NE	18000	18300	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
PYRENE	NE	1700	1720	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U

Table 4-1
Soil Analytical Data
Building 1221 (OT-C539) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC539-IS-0001-062912		OTC539-IS-0002-062912		OTC539-IS-0003-062912		OTC539-IS-0004-062912		OTC539-IS-0005-062912		OTC539-IS-0006-062912-FD		OTC539-IS-0007-062912		OTC539-IS-0008-062912		OTC539-IS-0009-062912	
				Sample Date	6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location	OT-C539-Station 1 influent line to tank		OT-C539-Station 1 influent line to tank		OT-C539-Station 2 septic tank		OT-C539-Station 2 septic tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 4 leach field		OT-C539-Station 4 leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		3 - 5		10 - 12		3 - 5		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																						
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U
1,3-DINITROBENZENE	NE	6.10	NE	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U
2,4-DINITROTOLUENE	NE	1.60	15.7	0.09	U	0.085	U	0.096	U	0.09	U	0.094	U	0.092	U	0.087	U	0.077	U	0.095	U
2,6-DINITROTOLUENE	NE	61.0	61.1	0.081	U	0.076	U	0.086	U	0.081	U	0.084	U	0.082	U	0.078	U	0.069	U	0.085	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U
2-NITROTOLUENE	NE	2.90	29.1	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U
3-NITROTOLUENE	NE	6.10	7.82	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U
4-NITROTOLUENE	NE	30.0	244.4	0.094	U	0.089	U	0.1	U	0.094	U	0.098	U	0.096	U	0.091	U	0.08	U	0.099	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U
NITROBENZENE	NE	4.80	53.5	0.086	U	0.082	U	0.092	U	0.087	U	0.09	U	0.088	U	0.084	U	0.074	U	0.091	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U
TETRYL	NE	240.0	244.0	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U
PCBS (mg/kg)																						
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0078	U	0.0075	U	0.0074	U	0.0076	U	0.0078	U	0.0079	U	0.0075	U	0.0076	U	0.0076	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.0097	U	0.0094	U	0.0093	U	0.0094	U	0.0098	U	0.0098	U	0.0093	U	0.0095	U	0.0094	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.0097	U	0.0094	U	0.0093	U	0.0094	U	0.0098	U	0.0098	U	0.0093	U	0.0095	U	0.0094	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0078	U	0.0075	U	0.0074	U	0.0076	U	0.0078	U	0.0079	U	0.0075	U	0.0076	U	0.0076	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0078	U	0.0075	U	0.0074	U	0.0076	U	0.0078	U	0.0079	U	0.0075	U	0.0076	U	0.0076	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0078	U	0.0075	U	0.0074	U	0.0076	U	0.0078	U	0.0079	U	0.0075	U	0.0076	U	0.0076	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0078	U	0.0075	U	0.0074	U	0.0076	U	0.0078	U	0.0079	U	0.0075	U	0.0076	U	0.0076	U
METALS (mg/kg)																						
ALUMINUM	13722	77000	78000	2140	J	2120		2440		1810		2830		3730		2750		2340		2560	
ANTIMONY	1.6	31	31.3	1.2	UJ	0.88	U	1.4	U	0.92	U	0.86	U	1	U	0.86	U	1	U	1.7	U
ARSENIC	3.7	0.39	3.90	1.3	J	0.88	U	0.71	U	0.92	U	0.91	J	1.4	J	0.86	U	1	U	0.87	U
BARIUM	169.3	15000	15600	30	J	18.6	J	21.4	J	24.3	J	26.4	J	31.5	J	25.1	J	21.9	J	20.5	J
BERYLLIUM	1.6	160	156	0.58	U	0.44	U	0.36	U	0.46	U	0.43	U	0.51	U	0.43	U	0.5	U	0.44	U
CADMIUM	0.3	70	70.3	0.58	U	0.44	U	0.71	U	0.68	J	0.43	U	0.51	U	0.43	U	0.5	U	0.87	U
CALCIUM	317332	NE	NE	246000		198000		182000		222000		210000		199000		214000		216000		205000	
CHROMIUM[d]	25	117000	117000	2	J	2	J	2.4	J	2.8	J	2.6	J	3.4	J	2.9	J	2.4	J	2.6	J
COBALT	7.7	23	NE	1	J	0.57	J	0.85	J	0.7	J	1.1	J	1.4	J	0.85	J	0.84	J	0.71	J
COPPER	13	3100	3130	1.4	J	0.95	J	1.4	J	1.9	J	1	J	1.4	J	5.1	J	1	U	0.96	J
IRON	23049	55000	54800	2000		2110		2640		1850		2490		3200		2780		2360		2540	
LEAD	10.9	400	400	0.78	J	1.3	J	0.71	U	0.73	B	1.2	J	1.5	J	1.1	J	0.92	J	0.87	U
MAGNESIUM	16991	NE	NE	2550	J	1310	J	1320	J	1550	J	2680		3400		1400	J	1600	J	1470	J
MANGANESE	393	1800	1860	28.7	J	30.6		39		27		41.2		62.7		37.8		31.3		35.3	
MERCURY	0.0108	10	15.6	0.0095	U	0.0089	U	0.0085	U	0.009	U	0.009	U	0.0096	U	0.0088	U	0.0089	U	0.0088	U
NICKEL	17.4	1500	1560	2.2	J	1.3	J	1.7	J	1.6	J	2.4	J	3	J	1.8	J	1.9	J	1.5	J
POTASSIUM	5077	NE	NE	675	J	650	J	621	J	560	J	935	J	1180	J	716	J	727	J	784	J

Table 4-1
Soil Analytical Data
Building 1221 (OT-C539) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC539-IS-0001-062912		OTC539-IS-0002-062912		OTC539-IS-0003-062912		OTC539-IS-0004-062912		OTC539-IS-0005-062912		OTC539-IS-0006-062912-FD		OTC539-IS-0007-062912		OTC539-IS-0008-062912		OTC539-IS-0009-062912	
				Sample Date	6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location	OT-C539-Station 1 influent line to tank		OT-C539-Station 1 influent line to tank		OT-C539-Station 2 septic tank		OT-C539-Station 2 septic tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 4 leach field		OT-C539-Station 4 leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		3 - 5		10 - 12		3 - 5		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
METALS (mg/kg)																						
SELENIUM	1.4	390	391		2.3	U	1.8	U	2.8	U	1.8	U	1.7	U	2	U	1.7	U	2	U	3.5	U
SILVER	1.1	390	391		0.58	U	0.44	U	0.36	U	0.46	U	0.43	U	0.51	U	0.43	U	0.5	U	0.44	U
SODIUM	5196	NE	NE		630	U	480	U	390	U	500	U	1420	J	1630	J	470	U	842	J	496	J
THALLIUM	1.3	0.78	0.782		1.5	J	1.1	U	1.9	U	1.2	U	1.1	U	1.3	U	1.1	U	1.3	U	2.3	U
VANADIUM	42.6	390	391		8.3	J	4.4	J	5.7	J	4.3	J	8.1	J	10.4	J	5.3	J	7.9	J	5.2	J
ZINC	54.6	23000	23500		5	J	5.2	J	4.8	J	5.2	J	6.6	J	8.8	J	82.6		5.4	J	4.8	J
PETROLEUM HYDROCARBONS (mg/kg)																						
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000		3.2	U	2.7	U	2.7	U	2.7	U	3.2	U	2.9	U	2.8	U	2.8	U	3.1	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000		3.9	U	3.8	U	3.7	U	5.28	J	3.9	U	3.9	U	3.7	U	3.8	U	3.8	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000		3.9	U	3.8	U	3.7	U	3.8	U	3.9	U	3.9	U	3.7	U	3.8	U	3.8	U
CYANIDE (mg/kg)																						
CYANIDE	NE	22.0	46.9		0.069	U	0.067	U	0.064	U	0.067	U	0.071	U	0.07	U	0.067	U	0.066	U	0.067	U
TRITIUM (HYDROGEN-3)																						
TRITIUM	NE	NE	NE		4.96	U	4.9	U	4.86	U	4.93	U	4.86	U	4.93	U	4.86	U	4.84	U	4.91	U

Table 4-1
Soil Analytical Data
Buidling 1221 (OT-C539) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Table 4-2
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	LDY-IDW01-090412	
		Sample Date	9/4/2012	
		Sample Type	Waste	
		40 CFR 261 Waste Characteristic Criteria	Result	Lab Qual
General Chemistry				
Corrosivity as pH	pH Units	> 2 and < 12.5	**7.7**	
Cyanide Reactivity	mg/kg	< 250	1.5	U
Ignitability (Flashpoint)	°F	> 140 °F	>200	
Solids, Percent	%	-	**84.4**	
Sulfide Reactivity	mg/kg	< 500	59	U
TCLP Volatiles				
Benzene	mg/L	0.5	0.0020	U
Chlorobenzene	mg/L	100	0.0020	U
Chloroform	mg/L	6	0.0022	U
Carbon tetrachloride	mg/L	0.5	0.0025	U
1,1-Dichloroethylene	mg/L	0.7	0.0023	U
1,2-Dichloroethane	mg/L	0.5	0.0020	U
p-Dichlorobenzene	mg/L	7.5	0.0023	U
Methyl ethyl ketone	mg/L	200	0.0020	U
Tetrachloroethylene	mg/L	0.7	0.0025	U
Trichloroethylene	mg/L	0.5	0.0026	U
Vinyl chloride	mg/L	0.2	0.0022	U
TCLP Semivolatiles				
2-Methylphenol	mg/L	200	0.0054	U
3&4-Methylphenol	mg/L	200	0.011	U
Pentachlorophenol	mg/L	100	0.054	U
2,4,5-Trichlorophenol	mg/L	400	0.0050	U
2,4,6-Trichlorophenol	mg/L	2	0.0050	U
1,4-Dichlorobenzene	mg/L	7.5	0.010	U
2,4-Dinitrotoluene	mg/L	0.13	0.0050	U
Hexachlorobenzene	mg/L	0.13	0.0056	U
Hexachlorobutadiene	mg/L	0.5	0.010	U
Hexachloroethane	mg/L	3	0.010	U
Nitrobenzene	mg/L	2	0.0059	U
Pyridine	mg/L	100	0.016	U
TCLP Metals				
Arsenic	mg/L	5	0.020	U
Barium	mg/L	100	**0.12**	J
Cadmium	mg/L	1	0.010	U
Chromium	mg/L	5	0.010	U
Lead	mg/L	5	0.010	U
Mercury	mg/L	0.2	0.00050	U
Selenium	mg/L	1	0.020	U
Silver	mg/L	5	0.010	U

Table 4-2
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

°F = degrees Fahrenheit
> = greater than
< = less than
% = percent
CFR = Code of Federal Regulations
J = estimated value
Lab Qual = laboratory qualifier
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
TCLP = Toxicity Characteristic Leaching Procedure
U = not detected at the detection limit shown

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles				
Acetone	µg/L	NE	10	U
Benzene	µg/L	5	0.21	U
Bromodichloromethane	µg/L	80	0.20	U
Bromoform	µg/L	80	0.34	U
Chlorobenzene	µg/L	100	0.20	U
Chloroethane	µg/L	NE	0.50	U
Chloroform	µg/L	80	0.26	U
Carbon disulfide	µg/L	NE	0.49	U
Carbon tetrachloride	µg/L	5	0.31	U
Cyclohexane	µg/L	NE	0.48	U
1,1-Dichloroethane	µg/L	NE	0.21	U
1,1-Dichloroethylene	µg/L	7	0.20	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.71	U
1,2-Dibromoethane	µg/L	0.05	0.30	U
1,2-Dichloroethane	µg/L	5	0.22	U
1,2-Dichloropropane	µg/L	5	0.26	U
Dibromochloromethane	µg/L	80	0.20	U
Dichlorodifluoromethane	µg/L	NE	0.50	U
cis-1,2-Dichloroethylene	µg/L	70	**0.42**	J
cis-1,3-Dichloropropene	µg/L	NE	0.22	U
m-Dichlorobenzene	µg/L	NE	0.25	U
o-Dichlorobenzene	µg/L	600	0.22	U
p-Dichlorobenzene	µg/L	75	0.20	U
trans-1,2-Dichloroethylene	µg/L	100	0.23	U
trans-1,3-Dichloropropene	µg/L	NE	0.21	U
Ethylbenzene	µg/L	700	0.29	U
Freon 113	µg/L	NE	0.33	U
2-Hexanone	µg/L	NE	2.0	U
Isopropylbenzene	µg/L	NE	0.20	U
4-Methyl-2-pentanone	µg/L	NE	2.3	U
Methyl Acetate	µg/L	NE	5.0	U
Methyl bromide	µg/L	NE	0.79	U
Methyl chloride	µg/L	NE	0.50	U
Methylcyclohexane	µg/L	NE	0.20	U
Methylene chloride	µg/L	5	2.0	U
Methyl ethyl ketone	µg/L	NE	3.1	U
Methyl Tert Butyl Ether	µg/L	NE	0.21	U
Styrene	µg/L	100	0.20	U

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles (continued)				
1,1,1-Trichloroethane	µg/L	200	0.20	U
1,1,2,2-Tetrachloroethane	µg/L	NE	0.24	U
1,1,2-Trichloroethane	µg/L	5	0.20	U
1,2,4-Trichlorobenzene	µg/L	70	0.50	U
Tetrachloroethylene	µg/L	5	0.32	U
Toluene	µg/L	1000	0.20	U
Trichloroethylene	µg/L	5	0.31	U
Trichlorofluoromethane	µg/L	NE	0.50	U
Vinyl chloride	µg/L	2	0.44	U
Xylene (total)	µg/L	10000	0.50	U
Semivolatiles				
2-Chlorophenol	µg/L	NE	0.68	U
4-Chloro-3-methyl phenol	µg/L	NE	0.78	U
2,4-Dichlorophenol	µg/L	NE	0.67	U
2,4-Dimethylphenol	µg/L	NE	0.74	U
2,4-Dinitrophenol	µg/L	NE	5.0	U
4,6-Dinitro-o-cresol	µg/L	NE	1.4	U
2-Methylphenol	µg/L	NE	0.69	U
3&4-Methylphenol	µg/L	NE	1.3	U
2-Nitrophenol	µg/L	NE	0.65	U
4-Nitrophenol	µg/L	NE	4.8	U
Pentachlorophenol	µg/L	1	4.8	U
Phenol	µg/L	NE	0.53	U
2,4,5-Trichlorophenol	µg/L	NE	0.86	U
2,4,6-Trichlorophenol	µg/L	NE	0.75	U
Acenaphthene	µg/L	NE	0.67	U
Acenaphthylene	µg/L	NE	0.67	U
Acetophenone	µg/L	NE	0.72	U
Anthracene	µg/L	NE	0.72	U
Atrazine	µg/L	3	0.83	U
Benzaldehyde	µg/L	NE	4.8	U
Benzo(a)anthracene	µg/L	NE	0.52	U
Benzo(a)pyrene	µg/L	0.2	0.55	U
Benzo(b)fluoranthene	µg/L	NE	0.73	U
Benzo(g,h,i)perylene	µg/L	NE	0.64	U
Benzo(k)fluoranthene	µg/L	NE	0.64	U
4-Bromophenyl phenyl ether	µg/L	NE	0.76	U
Butyl benzyl phthalate	µg/L	NE	0.68	U
1,1'-Biphenyl	µg/L	NE	0.92	U
2-Chloronaphthalene	µg/L	NE	0.70	U

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Semivolatiles (continued)				
4-Chloroaniline	µg/L	NE	0.66	U
Caprolactam	µg/L	NE	2.4	U
Carbazole	µg/L	NE	0.50	U
Chrysene	µg/L	NE	0.56	U
bis(2-Chloroethoxy)methane	µg/L	NE	0.67	U
bis(2-Chloroethyl)ether	µg/L	NE	0.69	U
bis(2-Chloroisopropyl)ether	µg/L	NE	0.76	U
4-Chlorophenyl phenyl ether	µg/L	NE	0.84	U
2,4-Dinitrotoluene	µg/L	NE	0.66	U
2,6-Dinitrotoluene	µg/L	NE	0.77	U
3,3'-Dichlorobenzidine	µg/L	NE	0.71	U
Dibenzo(a,h)anthracene	µg/L	NE	0.56	U
Dibenzofuran	µg/L	NE	0.72	U
Di-n-butyl phthalate	µg/L	NE	0.96	U
Di-n-octyl phthalate	µg/L	NE	0.96	U
Diethyl phthalate	µg/L	NE	0.96	U
Dimethyl phthalate	µg/L	NE	0.77	U
bis(2-Ethylhexyl)phthalate	µg/L	6	1.1	U
Fluoranthene	µg/L	NE	0.56	U
Fluorene	µg/L	NE	0.73	U
Hexachlorobenzene	µg/L	1	0.66	U
Hexachlorobutadiene	µg/L	NE	0.92	U
Hexachlorocyclopentadiene	µg/L	50	0.76	U
Hexachloroethane	µg/L	NE	0.71	U
Indeno(1,2,3-cd)pyrene	µg/L	NE	0.55	U
Isophorone	µg/L	NE	0.61	U
2-Methylnaphthalene	µg/L	NE	0.66	U
2-Nitroaniline	µg/L	NE	0.72	U
3-Nitroaniline	µg/L	NE	0.62	U
4-Nitroaniline	µg/L	NE	0.93	U
Naphthalene	µg/L	NE	0.61	U
Nitrobenzene	µg/L	NE	0.69	U
N-Nitroso-di-n-propylamine	µg/L	NE	0.82	U
N-Nitrosodiphenylamine	µg/L	NE	0.96	U
Phenanthrene	µg/L	NE	0.68	U
Pyrene	µg/L	NE	0.65	U
Petroleum Hydrocarbons				
Gasoline Range Organics (C6-C10)	mg/L	NE	0.05	U
Diesel Range Organics (C10-C28)	mg/L	NE	**0.115**	J
Oil Range Organics (C28-C40)	mg/L	NE	0.10	U

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Metals				
Aluminum	µg/L	NE	**36.2**	J
Antimony	µg/L	6	**6.7**	J
Arsenic	µg/L	10	2.5	U
Barium	µg/L	2000	**29.1**	J
Beryllium	µg/L	4	0.50	U
Cadmium	µg/L	5	1.0	U
Calcium	µg/L	NE	**654,000**	
Chromium	µg/L	100	4	U
Cobalt	µg/L	NE	**6.2**	J
Copper	µg/L	1300	**2.9**	J
Iron	µg/L	NE	**97.5**	J
Lead	µg/L	15	2.2	U
Magnesium	µg/L	NE	**310,000**	
Manganese	µg/L	NE	**179**	
Mercury	µg/L	2	0.03	U
Nickel	µg/L	NE	**3.7**	J
Potassium	µg/L	NE	**16,500**	
Selenium	µg/L	50	4.0	U
Silver	µg/L	NE	0.50	U
Sodium	µg/L	NE	**762,000**	
Thallium	µg/L	2	0.078	U
Vanadium	µg/L	NE	**4.5**	J
Zinc	µg/L	NE	**12.8**	J

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

[a] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

EPA = U.S. Environmental Protection Agency.

J = estimated value.

MCL = maximum contaminant level.

µg/L = micrograms per liter.

mg/L = milligrams per liter.

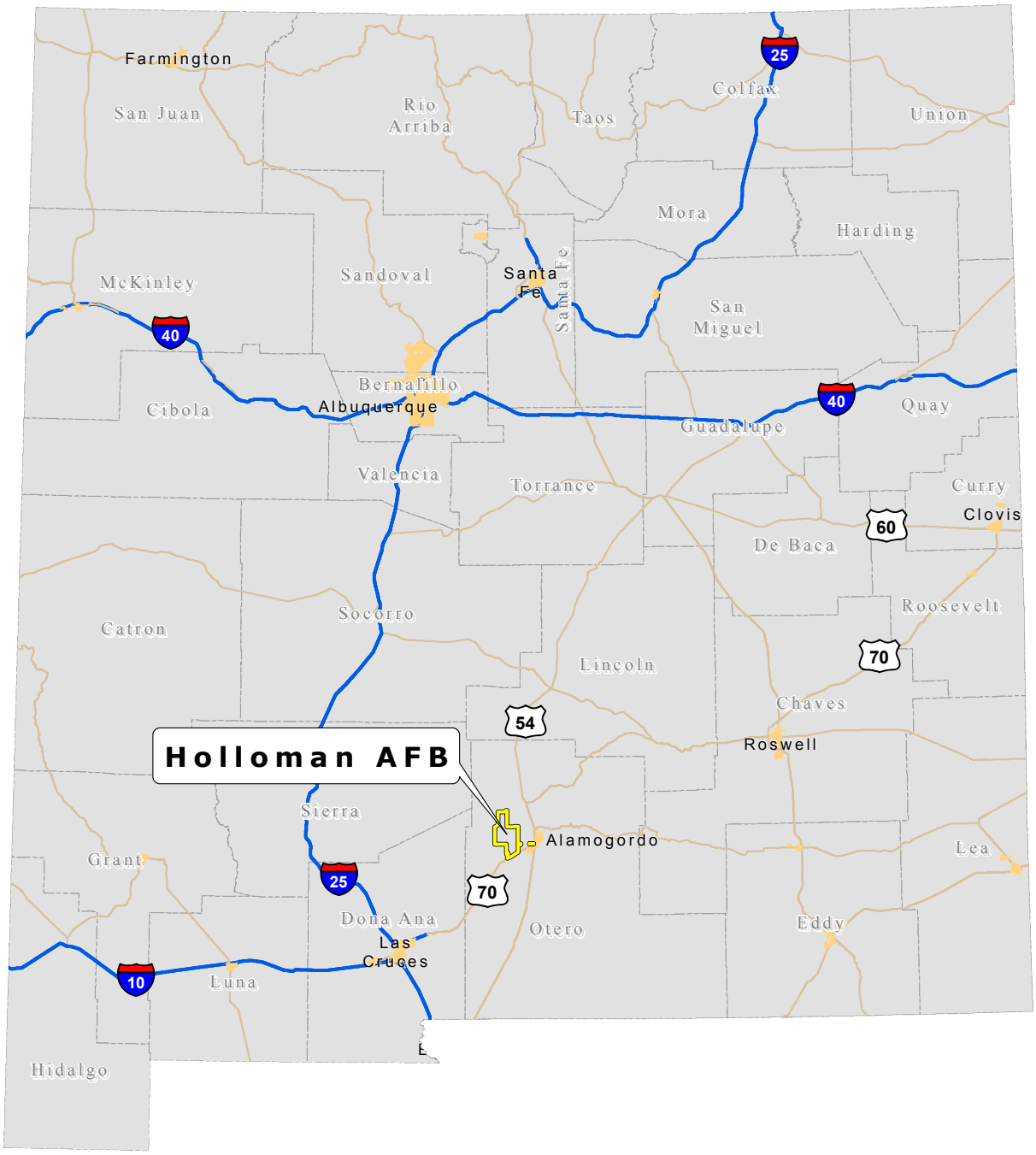
NE = not established

RSL = regional screening level.

U = not detected at the detection limit shown.

VQ = validation qualifier.

Figures



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Date: 8/28/2013

Approved By: BFoss

Checked By: CLong

Drawn By: BGrod

Office: Hou

Legend

Holloman AFB

N

WGS 84 UTM Zone 13N Meters

0 20 40 80
Kilometers

0 10 20 40
Miles

Figure 1-1

Holloman Air Force Base Location

Holloman AFB, New Mexico

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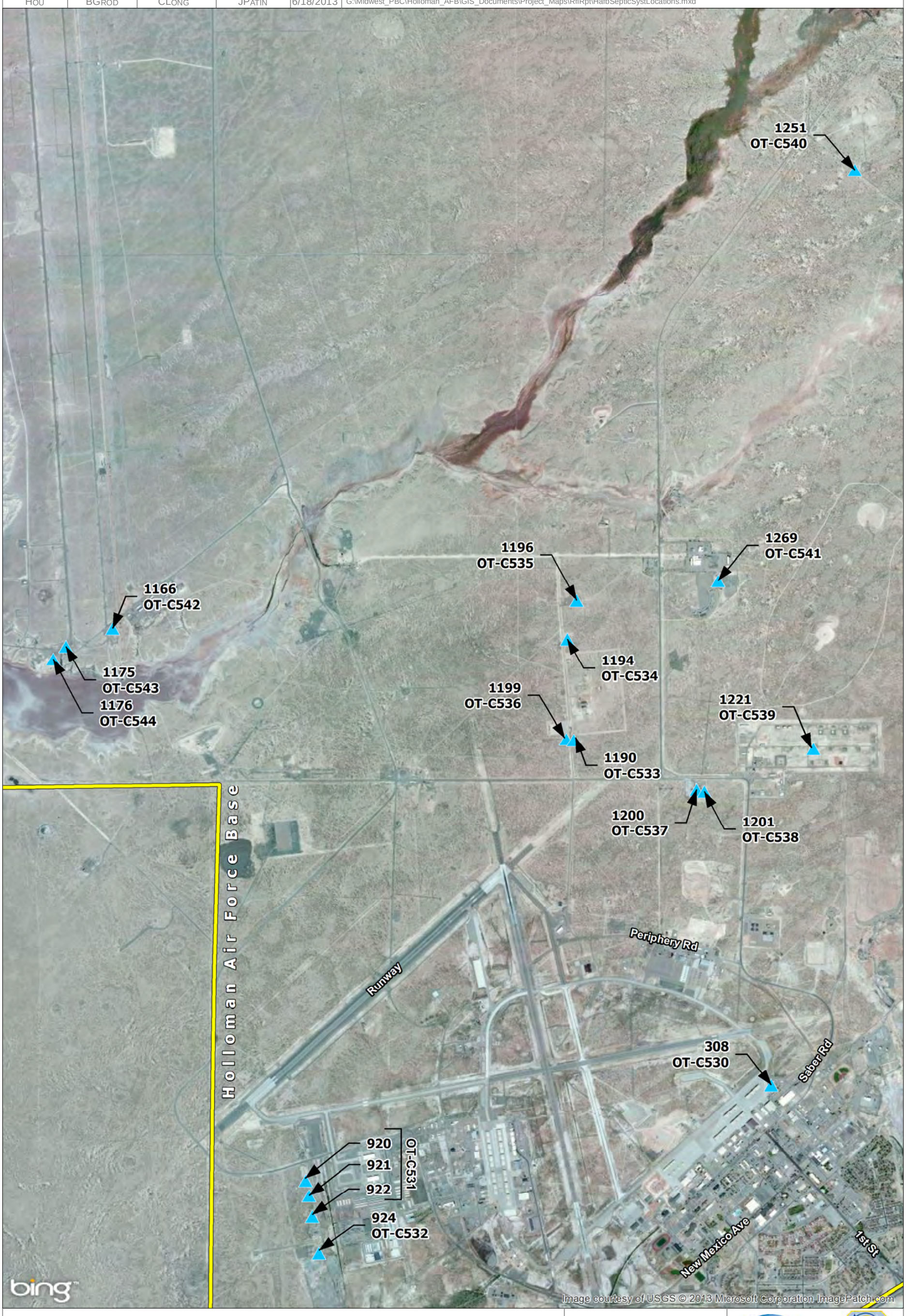


LEGEND

- Holloman AFB
- Septic Tank System

N

WGS 84 UTM Zone 13N
Meters

1 inch = 2,800 feet

0 700 1,400 2,800
Feet

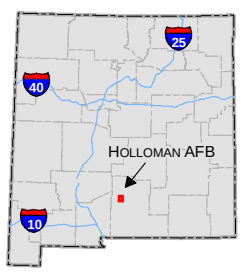
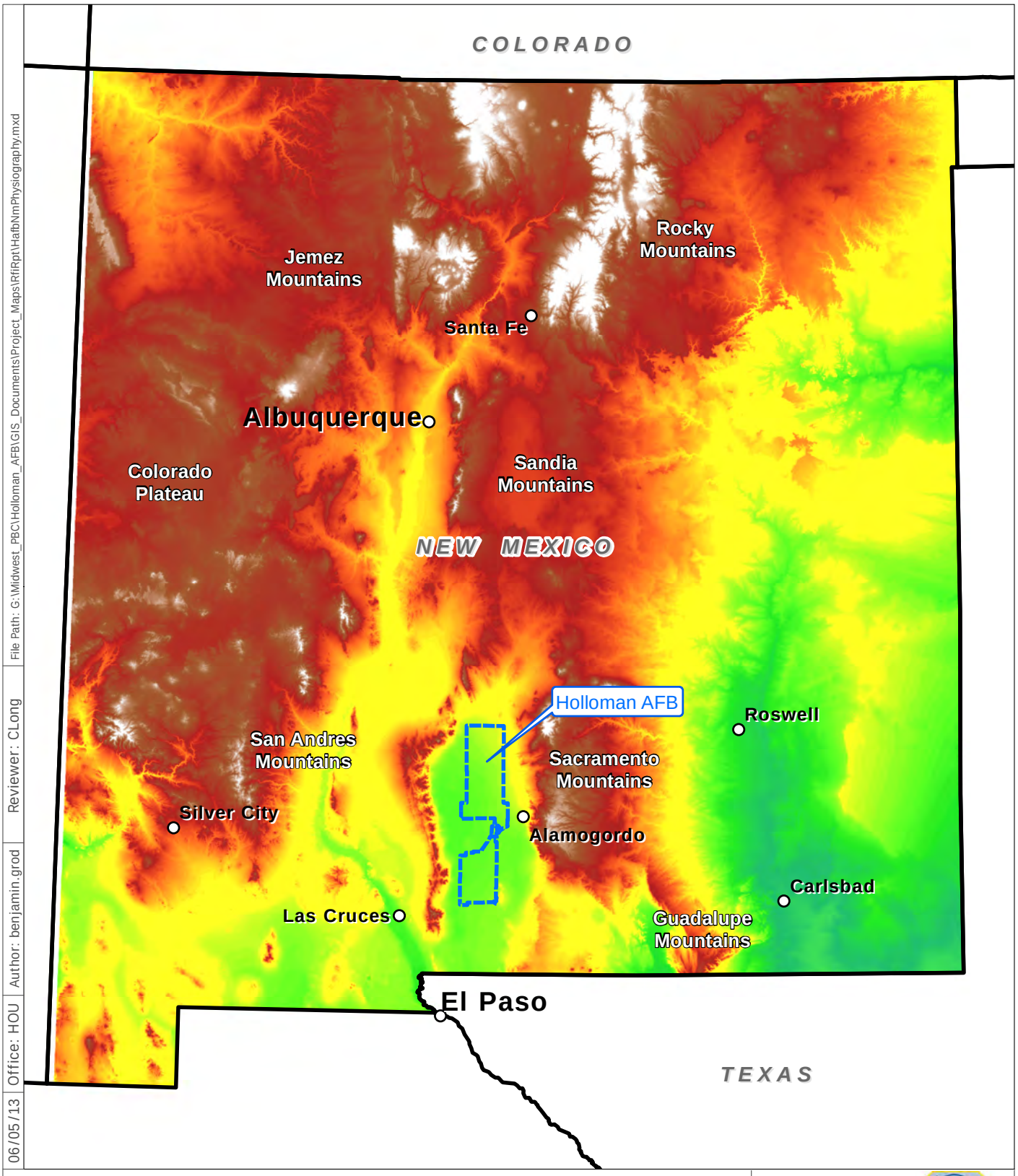


Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
Holloman AFB, NM



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Reviewer: CLong
Author: benjamin.grod
Office: HOU
06/05/13

Legend

Holloman Air Force Base (AFB) Installation Area

Elevation
- High : 3,936 meters
- Low : 0 meters

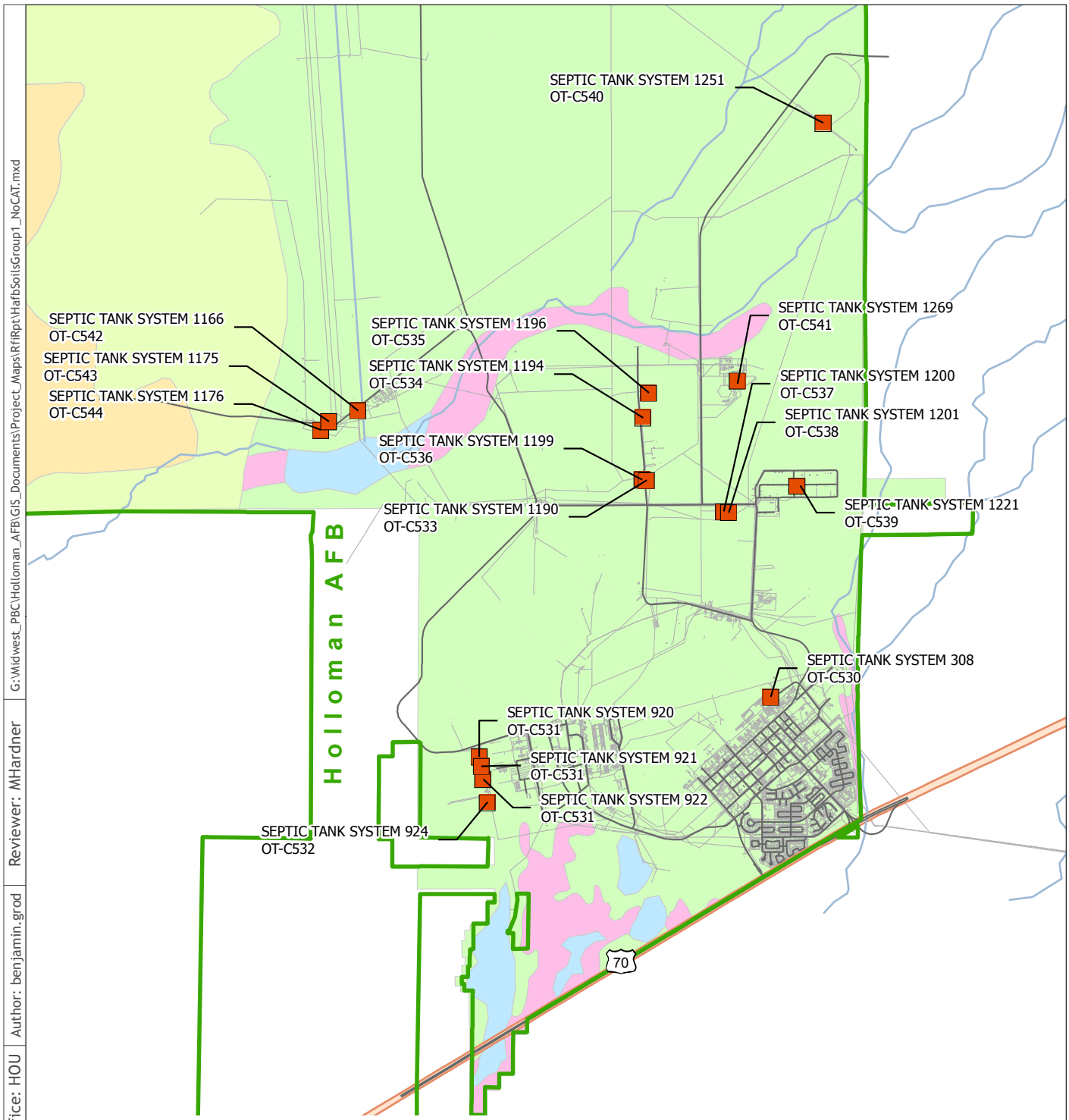
NAD 83 SPCS
New Mexico Central
Feet

0 50
Miles

Figure 2-1

Physiographic Map

Holloman AFB, New Mexico



Note:
1) Soils types at Holloman Air Force Base, New Mexico are based on United States Department of Agriculture (USDA) Soil Conservation Service Classifications. Source USDA, 1981

06/18/13 | Office: HOU | Author: benjamin.grod | Reviewer: MHardner | G:\Widwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbSoilsGroup1_NoCAT.mxd

Legend

- Installation Area
- Group 1 Septic Tank Sites
- Surface Water
- Active Dune Land Gypsum
- Duneland Yesum Association
- Holloman-Gypsum Land-Yesum complex
- Intermittent Water
- Mead Silty Clay Loam
- Rock Land Warm

NAD 83 SPCS
New Mexico Central
Feet

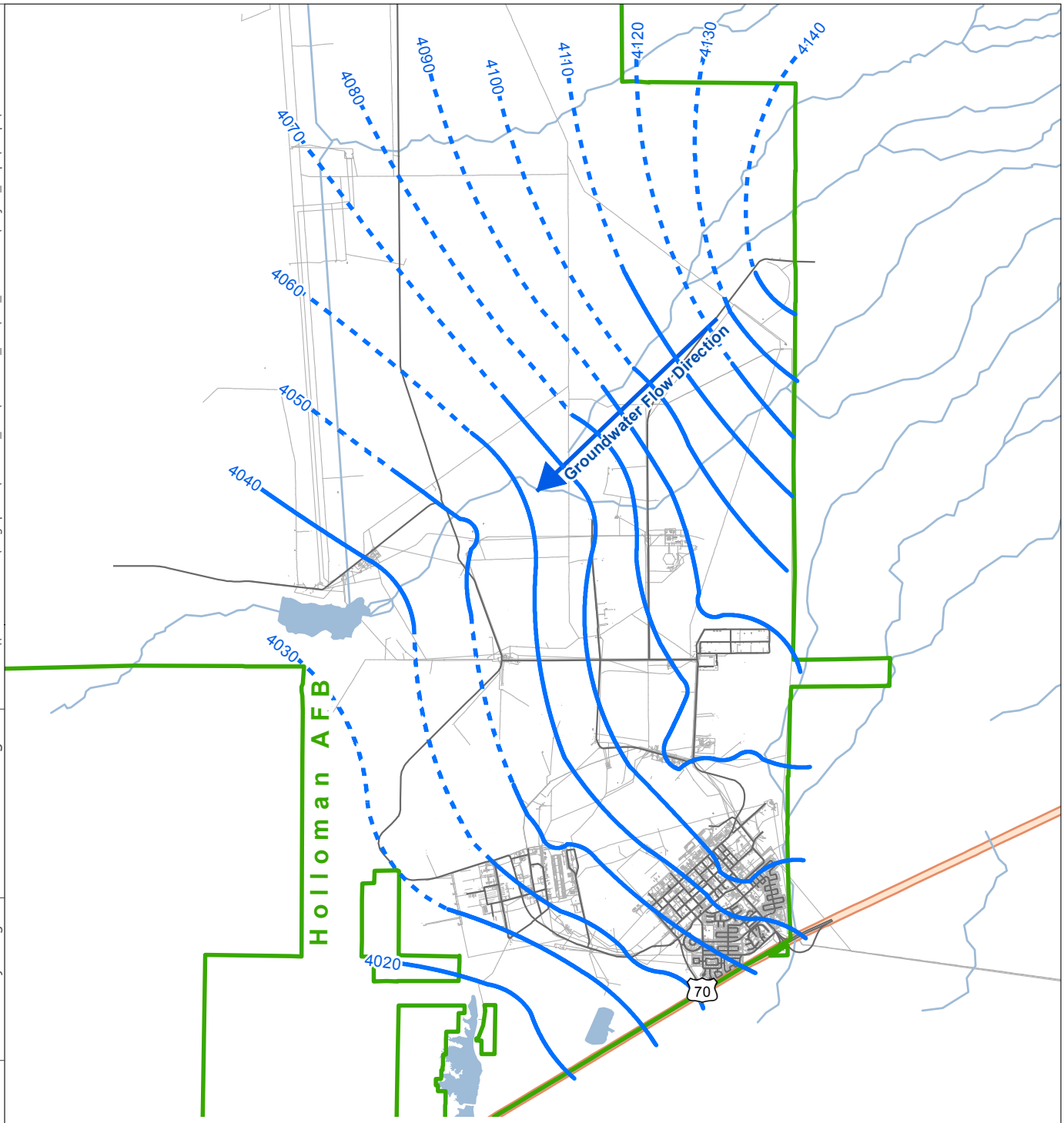
0 7,000
Feet

CBI

Figure 2-2

Septic Systems Soils Map

Holloman AFB, New Mexico



Note:
1) Groundwater contour map showing groundwater elevation contours across Holloman Air Force Base, New Mexico, are based on 2002 measurements taken from the shallow aquifer.
2) Source: Holloman AFB GIS, 2002 LTM.

08/28/13 | Office: HOU | Author: benjamin.grod | Reviewer: CLong | File Path: \\cfsfs01.cfs.com\arcgisprod2\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbGw2002.mxd

Legend

- Installation Area
- Groundwater Flow Direction
- Groundwater Elevation Contour (ft) (Dashed where inferred)
- Surface Water

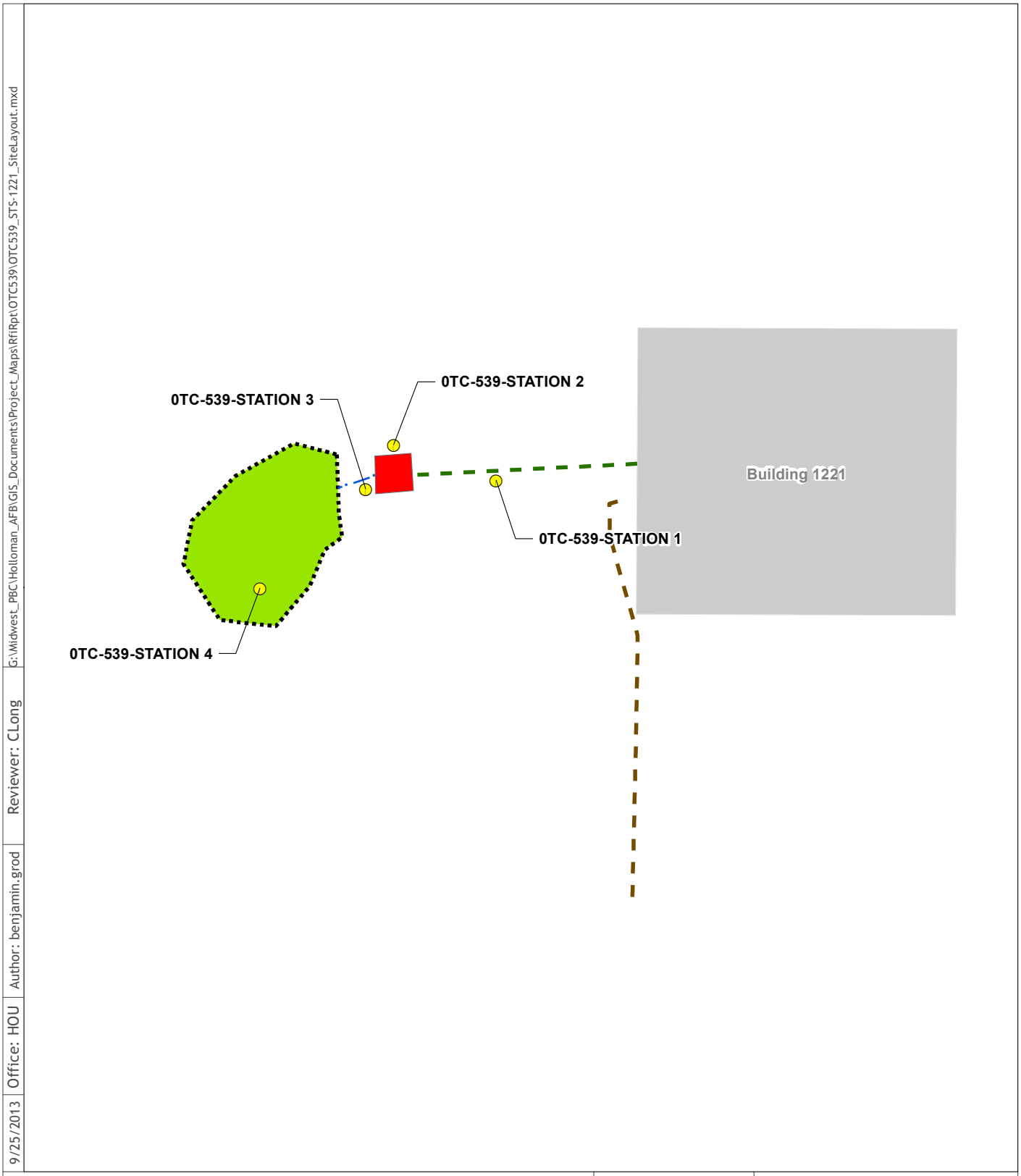
NAD 83 SPCS
New Mexico Central
Feet

0 8,000
Feet

Figure 2-3

Regional Groundwater Contour Map

Holloman AFB, New Mexico



9/25/2013 | Office: HOU | Author: benjamin.grod | Reviewer: CLong | G:\Widwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\OTC539\OTC539_STS-1221_SiteLayout.mxd

Legend

- Soil Boring Station
- Unknown Utility
- Influent Line
- Effluent Line
- Septic Tank
- Leach Field
- Building

N

NAD 83 SPCS
New Mexico Central
Feet

0 10 20
Feet

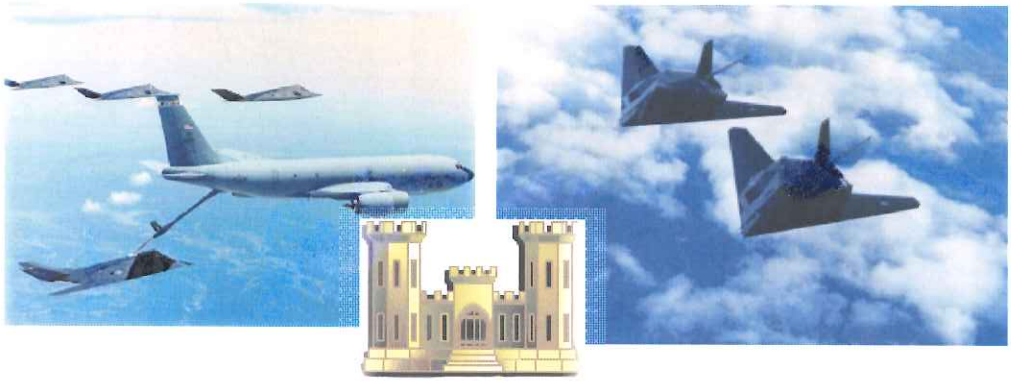
Figure 3-1

Site Layout and
Sampling Locations
Building 1221
Septic Tank System OT-C539

Holloman AFB, New Mexico

Appendix A
Historical Records

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS



Holloman Air Force Base
New Mexico

APRIL 2007

Headquarters, Air Combat Command
Langley Air Force Base, Virginia

49 CES/CEV
Holloman Air Force Base, New Mexico

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH FIGHTER WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

APR 27 2007

MEMORANDUM FOR NEW MEXICO ENVIRONMENT DEPARTMENT
Attn: Mr. James P. Bearzi
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe NM 87505-6303

FROM: 49 CES/CEV
550 Tabosa Ave.
Holloman AFB NM 88330-8458

SUBJECT: Submittal of Information Required by NMED Letter of August 30, 2006
Septic Tanks and Associated Drain Fields, Holloman AFB
EPA ID# NM6572124422

1. Pursuant to Part 4, Condition IV.B.3 of Permit No. NM6572124422, Holloman AFB is submitting the final portion of the required information.

2. This final portion of the required information covers the history of the facilities served by each septic tank and, based on the historic activities that occurred in each facility, the possible wastes that were discharged into the septic systems.

3. If you have any questions or comments, please contact Mr. Dave Griffin or Mr. George Fish at (505) 572-3931.

DEBORAH J. HARTELL
Chief, Environmental Flight

cc: w/Attachments
Mr. Cornelius Amindyas
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

Mr. David Strasser
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS
HISTORY

Holloman's records show a list of fifty seven (57) septic tank systems broken into three categories- Active Septic Systems, Inactive Septic Systems, and Removed Septic Systems. The systems are identified by the Building number they are/were attached to. There are twenty five (25) Active Septic Systems which are listed in this report. There are twenty one (21) Inactive Septic Systems that are listed and the history of activities in the building associated with the system is identified to the extent of available knowledge. There are eleven (11) Removed Septic Systems listed with histories based on available record knowledge.

The Active systems are identified, but no histories of the buildings are provided as this will likely change over time particularly with change in mission (aircraft on base) or tie-in to the base waste water treatment system. A history will be added to this list if and when the septic system is no longer needed and moved to the Inactive or Removed list.

The Inactive systems are scheduled for proper closure per guidance given in the NMED Liquid Waste Regulation 20.7.3.307 NMAC. This regulation calls for capping of the line(s) from the building to the septic tank, pumping out the tanks contents, penetration of the bottom of the tank, along with collapse of the tank roof and filling of the tank with sand or soil.

The septic systems on the Removed list have had the actual septic tank excavated and removed.

A search of Real Property records and the Historic Properties Inventory yielded the information available on the buildings. There was not information available on every building, but if new information becomes available, it will be added to the list.

Attachment 54a-e shows the current plan of where the sewer system lies to show what buildings are currently connected to Holloman's Sewer System. Any building that does not have an active septic tank is either abandoned or connect to Holloman's Sewer System.

ACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	149	1998		1000
2	312	1994		1000
3	375	1968		500
4	882			
5	864 (863)	1994	5'x8'x6'4"	750
6	885	1970	7'10"x4'8"x6'10"	1000
7	886			
8	887	1991		1000
9	923	1959	4'2"x7"x7'9.5"	1600
10	1022	1992		1200
11	1066	1994		1000
12	1160	1957	5'x12'4"x7'6"	1500
13	1161	1957		750
14	1162	1957		350
15	1163	1957		350
16	1169	1962		1680
17	1195	1962		1260
18	1256	1970	12'8"x4'8"x5'	
19	1270			
20	1271			
21	1278	2004		1250
22	1284			
23	1625			
24	75600	1989		1200
25	La Luz Gate (1290)(**1292**)	2004		1250

INACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	308	1965		
2	920	1959	4'2"x7"x7'9.5"	1600
3	921	1959	4'2"x7"x7'9.5"	1600
4	922	1959	4'2"x7"x7'9.5"	1600
5	924	1959	4'2"x7"x7'9.5"	1600
6	1091	1969	6'8"x3'x8'5"	
7	1097	1987	5'10"x5'x7'8"	1672
8	1190	1952	9'x4'x8'10"	3000
9	1194	1987	4'x4'x8'10"	1350
10	1196	1993	4'6"x11'x6'	1300
11	1199	1957		500
12	1200	1954	4'x8'x4'	1000
13	1201	1951	2'6"x6'6"x5'5"	650
14	1219	1985	5'4"x10'6"x8'4"	
15	1221	1983	4'8"x9'4"x6'2"	1100
16	1226	1985	5'6'2"x6'	
17	1235	1986		1189
18	1239	1977	4'6"x8'6"x6'	750
19	1250	1957		350
20	1251			
21	1269	1966	4'6"x9'	500

INACTIVE SEPTIC SYSTEMS

BUILDING 308

This is a 3200 SF building originally constructed in 1965. The original operation in the building was calibration of guided weapons for aircraft. In the 1970s and early 1980s the building was used as a nosedock for F-4 - Test Aircraft Radar electronic work area. It has never had a floor drain.
This facility is currently being used to store air craft support equipment for Building 309. The shop has been used in the past for servicing, inspecting, and repairing AGE equipment, but due to the reduction in personnel, this work is currently only performed in Building 309. The need to expand the work area for AGE equipment maintenance into Building 308 in the near future is not anticipated. A current view of the building is shown below in Figure 1.

Figure 1: Picture of Bldg. 308

Facilities associated with the septic system consist of:

- Toilet
- Lavatory
- Janitorial Sink

The building is located at 340 Delaware Ave. The point of contact for this building is Ms. Vicky Cruz and Mr. Adam Ferrara, they can be reached at 575-~~475~~-5272. The hours

572

of operation for this building when it is in use is one 8.5 hr shift (0630-1500) and one 9 hr shift (1500-2400), five days per week.

Industrial Wastewater Drainage: There are no floor or trench drains in this facility. A janitor's sink is located in the restroom. The sanitary sewer pipe from the restroom connects with the pipe from the restrooms in Building in 309. The effluent pipe then proceeds south to Manhole 334E the layout of this facility can be seen below in **Figure 2**. At the time of the inspection surveyors were unable to open Manhole 334E. No cross-connections to the storm sewer were identified.

Industrial Wastewater Sources/Existing Pretreatment/ Existing Management Practices: There is only once source of industrial wastewater from this facility: floor washing

Floor Washing: The floor in this facility is washed every three months using a Tennant floor scrubber, 10 gallons of water and Simple Green. Average and maximum daily wastewater flows from this activity are estimated to be less than one gallon and ten gallons, respectively. The wastewater from this activity is discharged into the French drain at Building 309; therefore, the quantity of wastewater generated by this activity is included in the flow summary for Building 309.

Existing management practices consist of sweeping the floor prior to washing it.

Site Description: Aircraft Corrosion Control
Site Specific Contingency Action Plan: See Attachment 1
Secondary Containment Routes: None
Probable Spill Route: Leaks dissipate in local area on ground
Material Compatibility: No material incompatibilities

Connected to Sewer?

Stored Substances:

Chemical	Container Type
MEK	1 gallon can
Polyurethane Paint	1 gallon can
Naptha	1 gallon can
Toluene	1 gallon can
Epoxy Primer	1 gallon can
PD-680 Type II	55 gallon drum
Waste Paint/Thinners	55 gallon drum

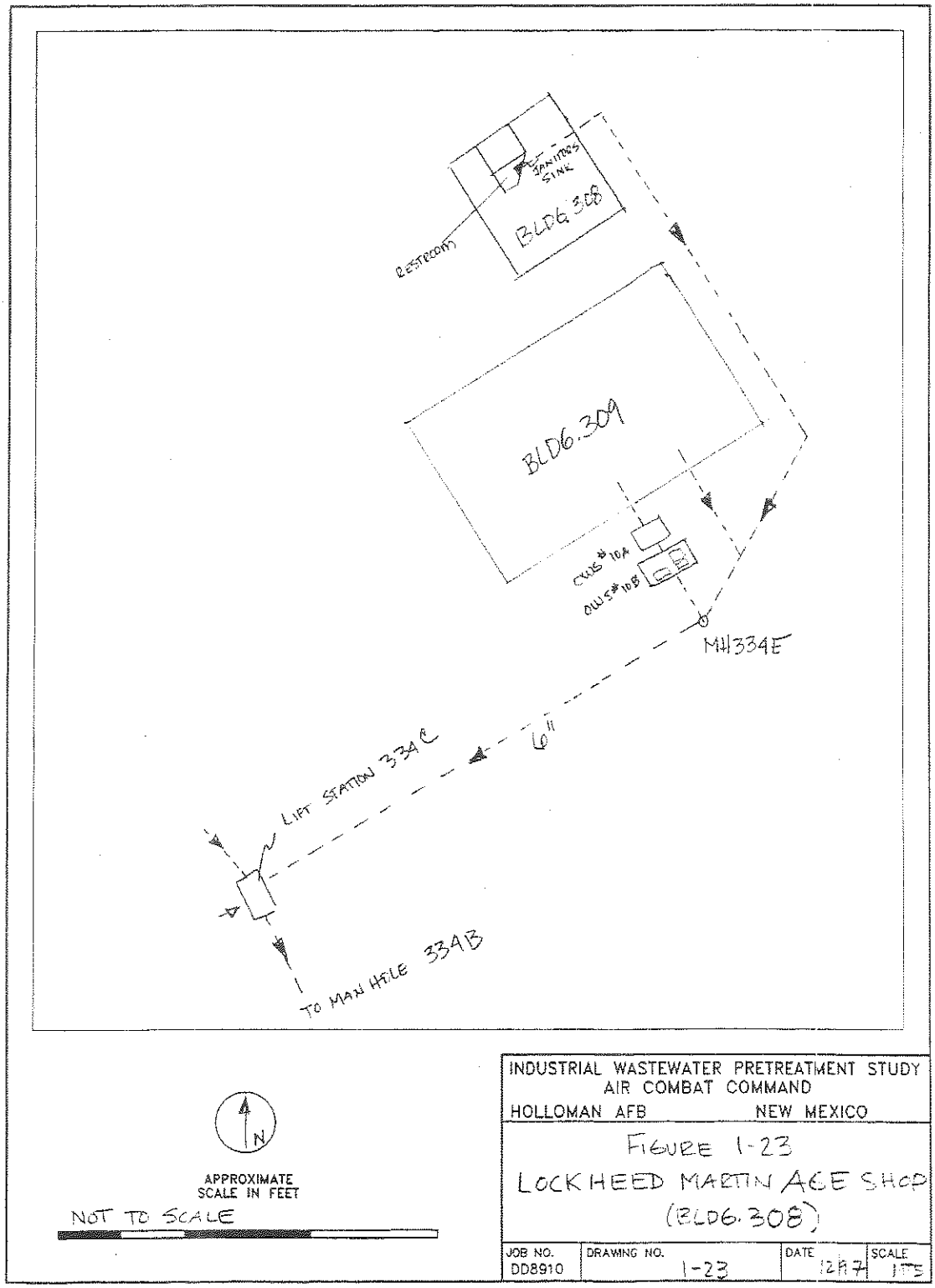


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Figure 2: Layout of Bldg. 308 and 309

INACTIVE SEPTIC SYSTEMS

BUILDINGS 920, 921, 922

These are three identical buildings constructed in 1959. Each building has 1900 SF. They were originally built for ammunition assembly which primarily consisted of bolting rocket components together prior to use. All three buildings are presently vacant and empty.
Each of the three buildings has a simple bathroom consisting of a:

- Toilet
- Lavatory

Multiple inspections were set up for this site, but no one showed up. Therefore, no follow-up information was found. Pictures of the current buildings are shown below in Figures 3-5.

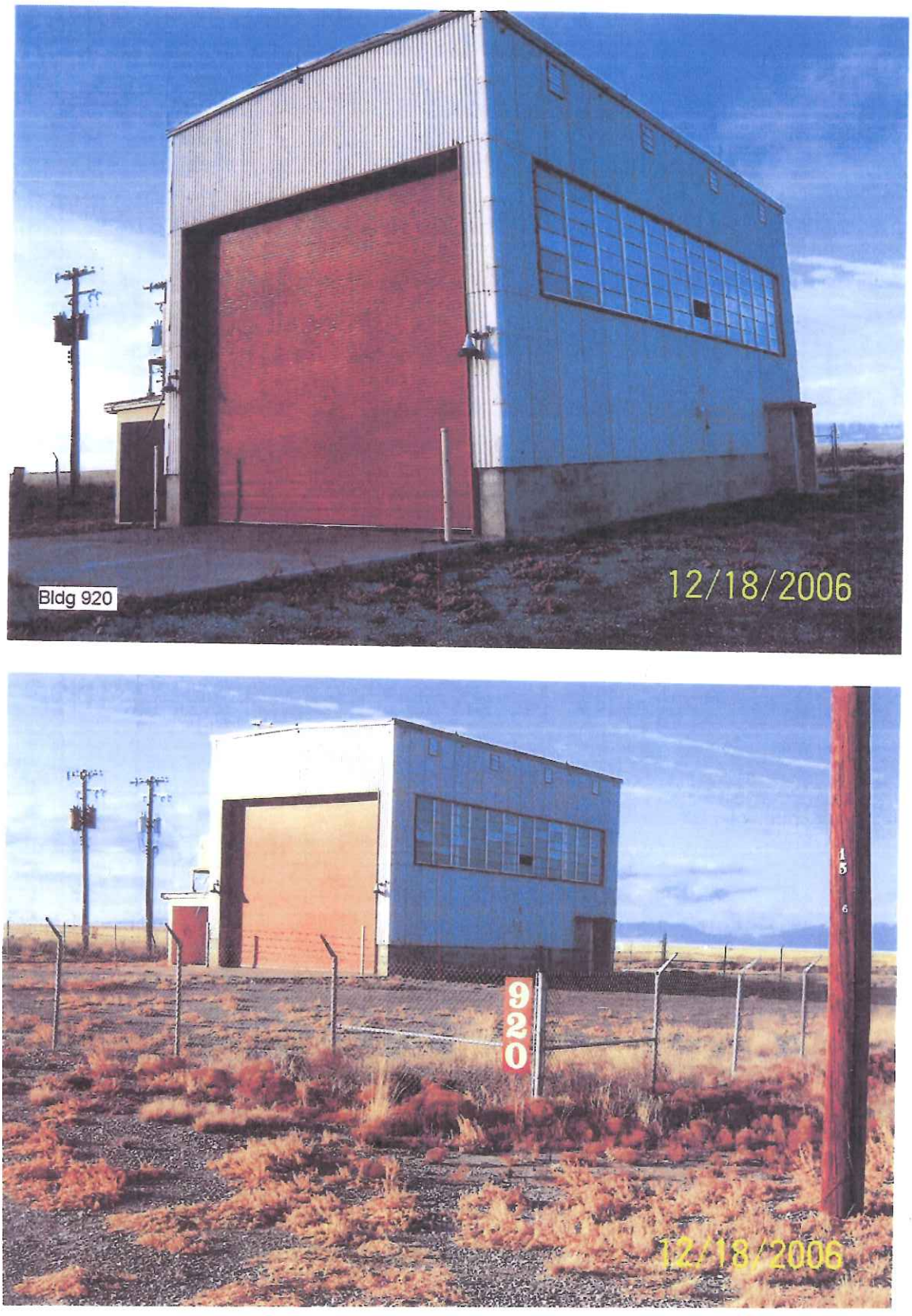


Figure 3: Pictures of Bldg. 920

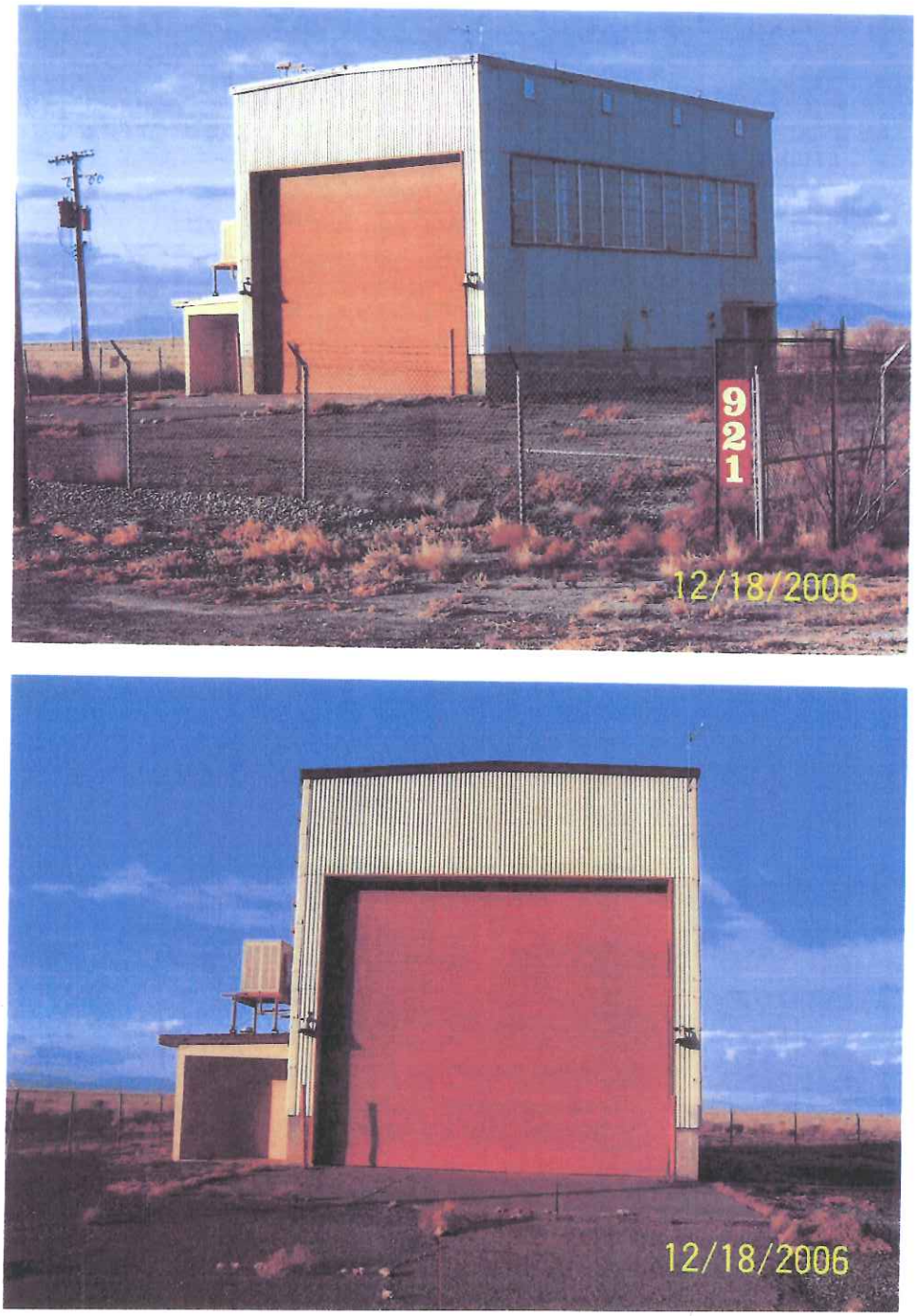


Figure 4: Pictures of Bldg. 921

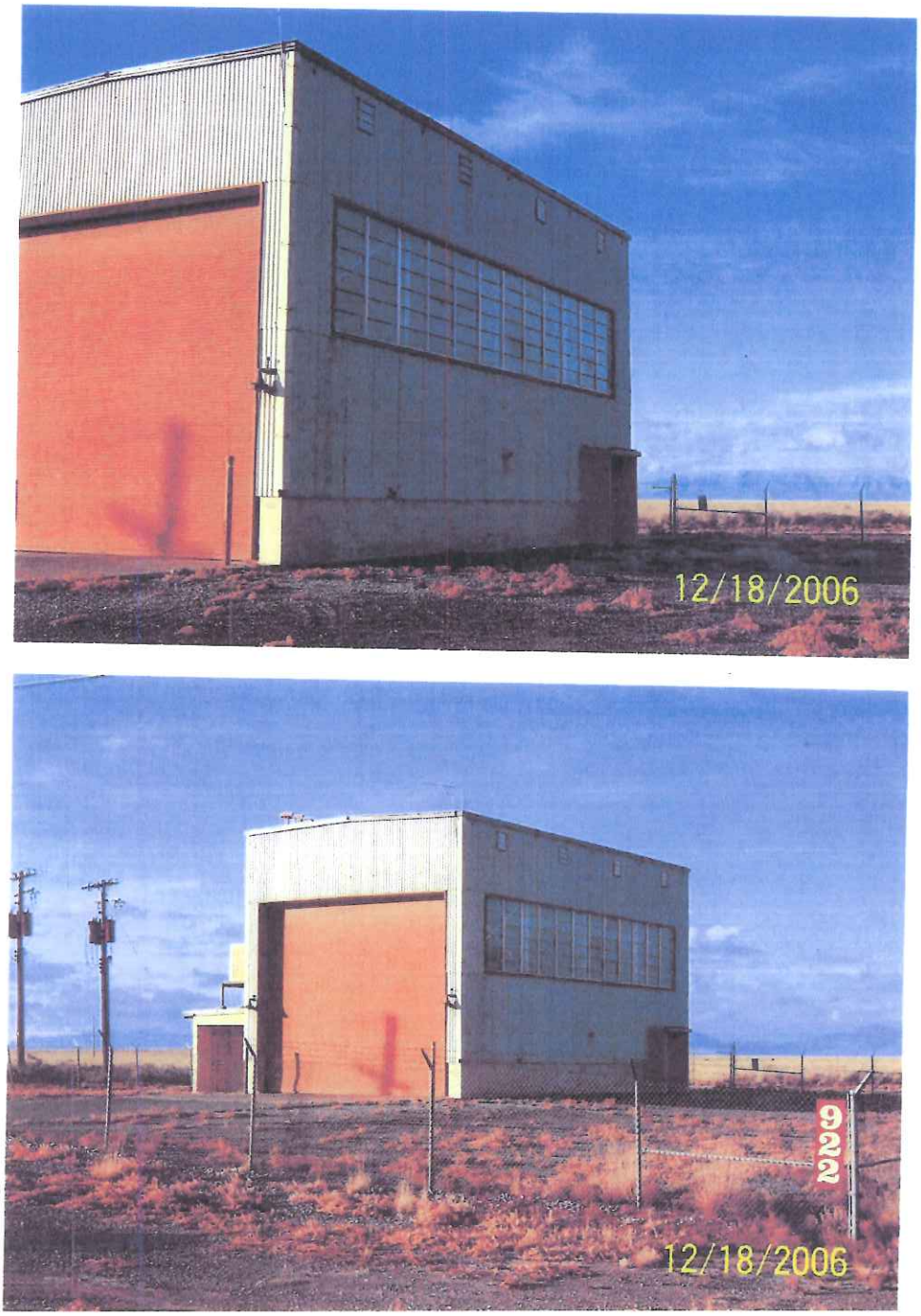


Figure 5: Pictures of Bldg. 922

INACTIVE SEPTIC SYSTEMS

BUILDING 924

This building was constructed in 1959 and has 4800 SF.
The building's original service was ammunition assembly similar to buildings 920-922.
It was later used for maintenance of radar tracking equipment.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

An on site inspection was done for this building on 20 Dec 2007 with the current facility manager, Mr. Michael Tackett. He did not have any information about the history of the septic tank system. Currently the building is being used for munitions storage. For the past two year it has stored rocket motors for the test track. From the on site inspection and drawings (Attachment 4-6) it can be seen that the bathroom drain is separate and there are no floor drains.

There are no pictures on file of this building.

INACTIVE SEPTIC SYSTEMS

BUILDING 1091

Site Description: There are no current files on this building because the building has been demolished. The building served as the Airfield Control Tower until replaced by the present Control Tower
On Attachment 55b a drawing of where the leach field was located in 1984 can be seen.
Grid Coordinates: J.9, 10.2
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: No secondary containment associated with underground storage tank
Probable Spill Route: Leakage from underground tank will contaminate water table in local vicinity

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 / UST

There were also three drawings that were discovered during the research stage of the project. The drawing (Attachment 7) shows the Septic Tank Details, Septic Tank Drain Field and the Drain Field Details.

INACTIVE SEPTIC SYSTEMS

BUILDING 1097

Specifications and history of this building are given in the following "Cold War Survey: Holloman Air Force Base". Along with this survey an on site inspection was done on 28 November 2007 with the current facility managers, A1C Clinton Bennett and TSgt Robert Edyburn. During the on site inspection it was discovered that the bathroom is separated from work area drains. In the past the building was used as a communications work center (office space) until 2005. There are no floor drains in the work area. It is currently being used as a houses base for a radio system network. There were also three drawings (Attachment 8-10) that were discovered in the investigation phase of the project. The drawings show the Materials Septic System, the Septic Tank Placement and Piping, the Latrine Plan, and the Mechanical Plumbing Plan.

Facilities in this building consist of:

- Toilet
- Urinal
- Lavatory

Description: Communications facility
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: None
Probable Spill Route: Leaks dissipate in local area on ground

Tank Location: South of facility
Fuel Flow – South/West

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 /AST
	500 gal each/ 1 /UST (Abandoned)

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Communications, Receiver.
Historic: Transmitter/Receiver.
Street Address: 1432 Sabre Road, HAFB, 88330-7842.

Building Number: 1097

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [ ] Minor [ ] Moderate [x] Major

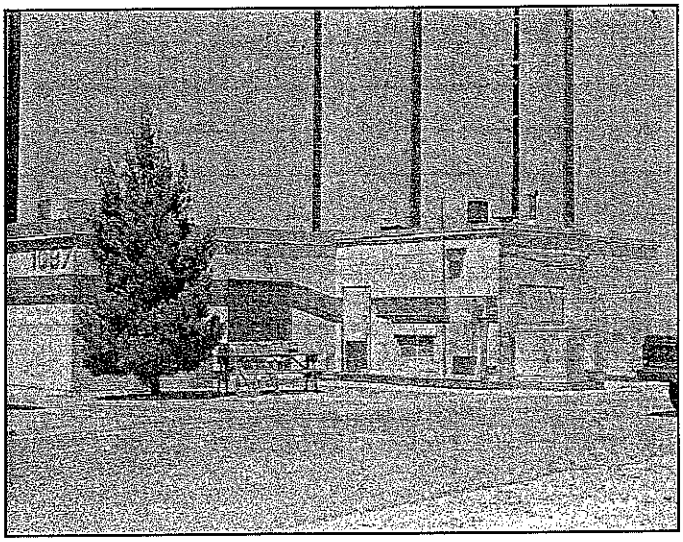
Comments:

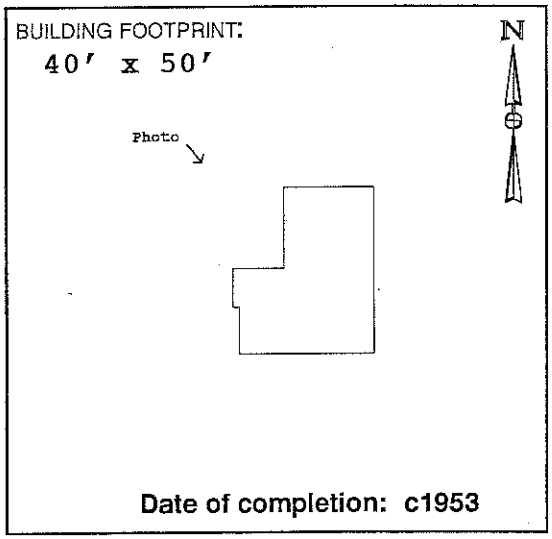
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1097 has not retained historic integrity.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1953

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1097 is a small transmitter building designed with few embellishments for utilitarian use only. Building 1097 originally had a rectangular footprint identical to Building 1098 and Building 1095. The original floor plan was sectioned into 4 rooms. An addition was constructed at the west elevation in 1986 using compatible structural and architectural components (CE File #1097-1). Both the builder and the architect are unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1097.

Current Function: Receiver/Air Traffic Control/Radio Control.

Original Function: Transmitter/Receiving/Communications.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1098-1 (c1952).

Foundation: Concrete wall footing. Concrete slab on granular fill.

Exterior walls: Painted concrete masonary units (CMU).

Roof: BUR on 2" rigid insul.; 2" poured gypsum on gyp board sup. by steel joists.

Notable interior features, including machinery:
Construction drawings document *"UHF Radio Air/Ground Facilities AN/GRC-27"*.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:
Continues to function as a communications facility/receiver site.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1097 has served as a Base communications facility since its completion c1953. Several renovations have resulted in a loss of historic integrity for this building. Building 1097 is no longer eligible for the National Register of Historic Places.

VII. ASSOCIATED BUILDINGS:

Location plan CE File #1098-2 identifies at least three north area transmitter sites. Building 1097 was associated with transmitter Building 1098. This facility is also associated with the flightline, and with communications Building 221.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building #1097 retains its original function as a radio receiver facility, however it has been modified to accommodate electrical, mechanical, and equipment additions and change-outs. Original equipment has been replaced.

Office space was added to the south elevation (1986: CE File #1097-1). All six windows at the north, east and west elevations have been blocked in. Original doors have been replaced. Vinyl floor tile covers original tile throughout. Dropped ceilings have been added.

This building, although retaining historic significance as a receiving site, has lost integrity of design, materials, workmanship, and association with its period of significance. Note: A Sgt. Boots (extension 3132) was identified by Building 1097 personnel as being a possible source for oral history research concerning specific activities associated with this facility.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Office space added to the west elevation (c1986: CE File #1097-1).

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Construction of adjacent buildings has altered viewshed.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Windows have been blocked in.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: An addition obscures the original west elevation. The original window treatments removed. Dropped ceilings added. Original asphalt floor tile covered.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: The presence of interior communications equipment and exterior poles contribute to the integrity of feeling as a radio site.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

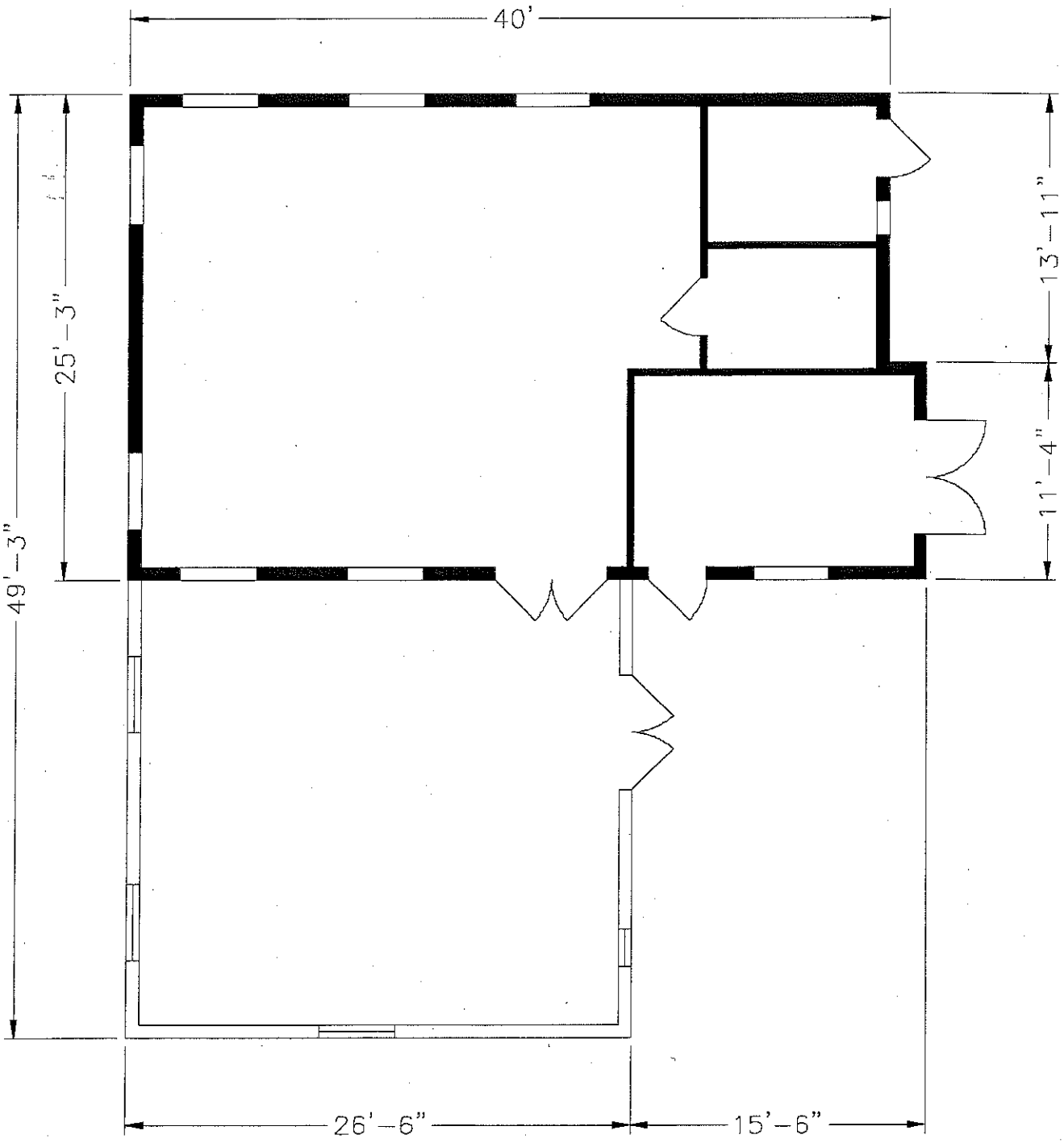
Comments: Original equipment has all been replaced.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #81**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



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Source: CE File #1098-2 (c1971)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1097** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1190

This building was constructed in 1952 and demolished in 2002. Specifications and history are provided in the "Cold War Survey".

The only drawing discovered was the plumbing floor plan and it can be seen in Attachment 11. Attachment 55d shows the current location of the leach field in 1984.

2002 Demolished Due To Unrelated Condition

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Security Police Building.
Historic: Change House/Unconventional Fuel Storage.
Street Address: 1514 Lethal Road, HAFB, 88330-7840.

Building Number: 1190

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1190 is in need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

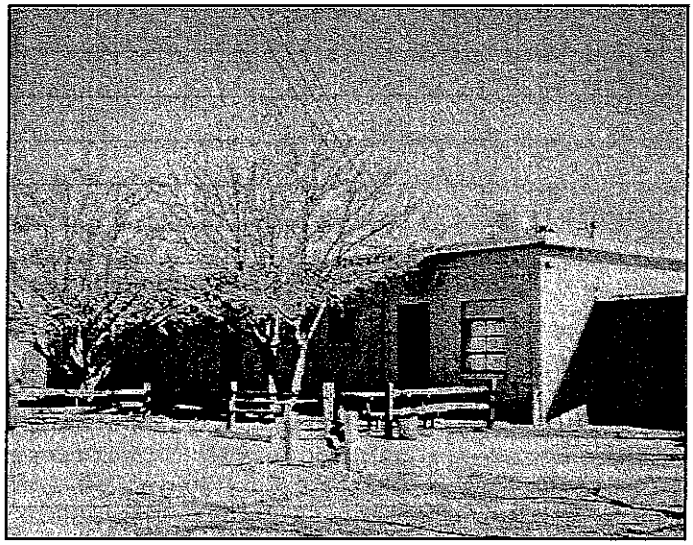
Comments: Interior partitions have been removed (date unknown).

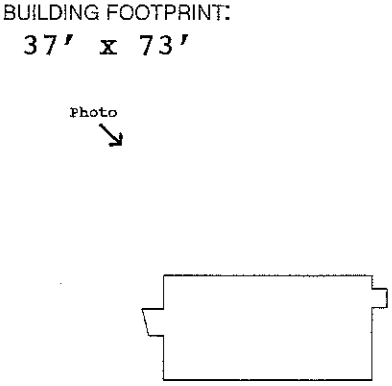
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1190 is a single-story, flat-roofed, concrete masonry unit (CMU) building exhibiting large roll-up equipment doors, numerous personnel access doors, and asymmetrical window fenestration. Construction drawings prepared in 1951 were stamped "As-built" but were not stamped in the revision block. Real Property Accountable Record/1190 indicates that Building 1190 was completed c1952 as a Change House for unconventional fuels personnel. W. C. Kruger Company (Santa Fe, NM) provided the construction drawings stored in CE File #1190. The builder is not known. A comparison of the current building and original blueprints reveals that no structural modifications to the building have occurred.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1190; CE File 1195-1 (c1951).

Current Function: Security Police operations.

Original Function: Change House, Unconventional Fuels.

Interim Functions: "RC Con House" (n.d.); "Prpln R-L Fuel/Lub" (n.d.); Prop Res Lab Rocket" (n.d.); "Prpln R-L Rkt" (n.d.); Sp Operations (n.d.).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1190-1 (c1951).

Foundation: Poured concrete footings and grade beams; concrete slab.

Exterior walls: Concrete masonry units (CMU).

Roof: (Built-up) gravel on rigid insul.; 2" slab sup. by metal lath and steel joists.

Notable interior features, including machinery: Shower stalls, locker room, dressing room, and laboratories.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

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VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Recommend reassessment of Building 1190 once the fifty-year construction date is met in the year 2002. This building retains historic integrity.

VII. ASSOCIATED BUILDINGS:

According to CE File #1190-1 *Title Sheet*, Unconventional Fuels Storage Building 1190 was associated with Building 1194 (Booster Inspection), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

This building retains all aspects of historic integrity. Although not meeting the "exceptional importance" standard imposed on buildings constructed within the last fifty years, Building 1190 remains potentially eligible as an individual property once the fifty-year date of construction is met in the year 2002. Recommend inclusion in a Multiple Property nomination along with the other unconventional fuels storage buildings. Building 1190 is currently being used as a storage and administrative facility by the 49th Squadron Security Police personnel. The original shower stalls, dressing room, locker room, shop, tools and supply rooms are all used for storage. Free-standing shelves have been installed to accommodate storage. As a result, some original doors and windows are blocked from view. Minor alterations have occurred at the interior. Two partitions have been removed. Glazed tile walls appear to have been added to at least one office. Vinyl tile has been installed over one section of the concrete slab in what once served as a machine shop. Some of the window panes have been painted. Because this facility remains potentially eligible, recommend that the original design features be considered in future modifications, and that photographs document any changes to the essential features. Suggested routine maintenance: Prune trees away from principal facade. Noticeable water damage warrants inspection of the roof. Replace broken window panes. Repair hole at exterior south elevation wall.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: Interior room layout as a Change House remains a key design element. This layout includes large open interior spaces, smaller labs/offices, and showers, dressing, and locker rooms used by unconventional fuels personnel.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Although no longer used as such, Building 1190 continues to be situated in the vicinity of other buildings historically associated with unconventional fuels testing and storage. This building appears to been recently landscaped.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two interior partitions removed. Glazed tile walls in office rather than CMU shown on original drawings.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Nearly all original workmanship remains visible, particularly at exterior.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Aside from the change in operations occurring here, Building 1190 remains essentially as it was originally constructed.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

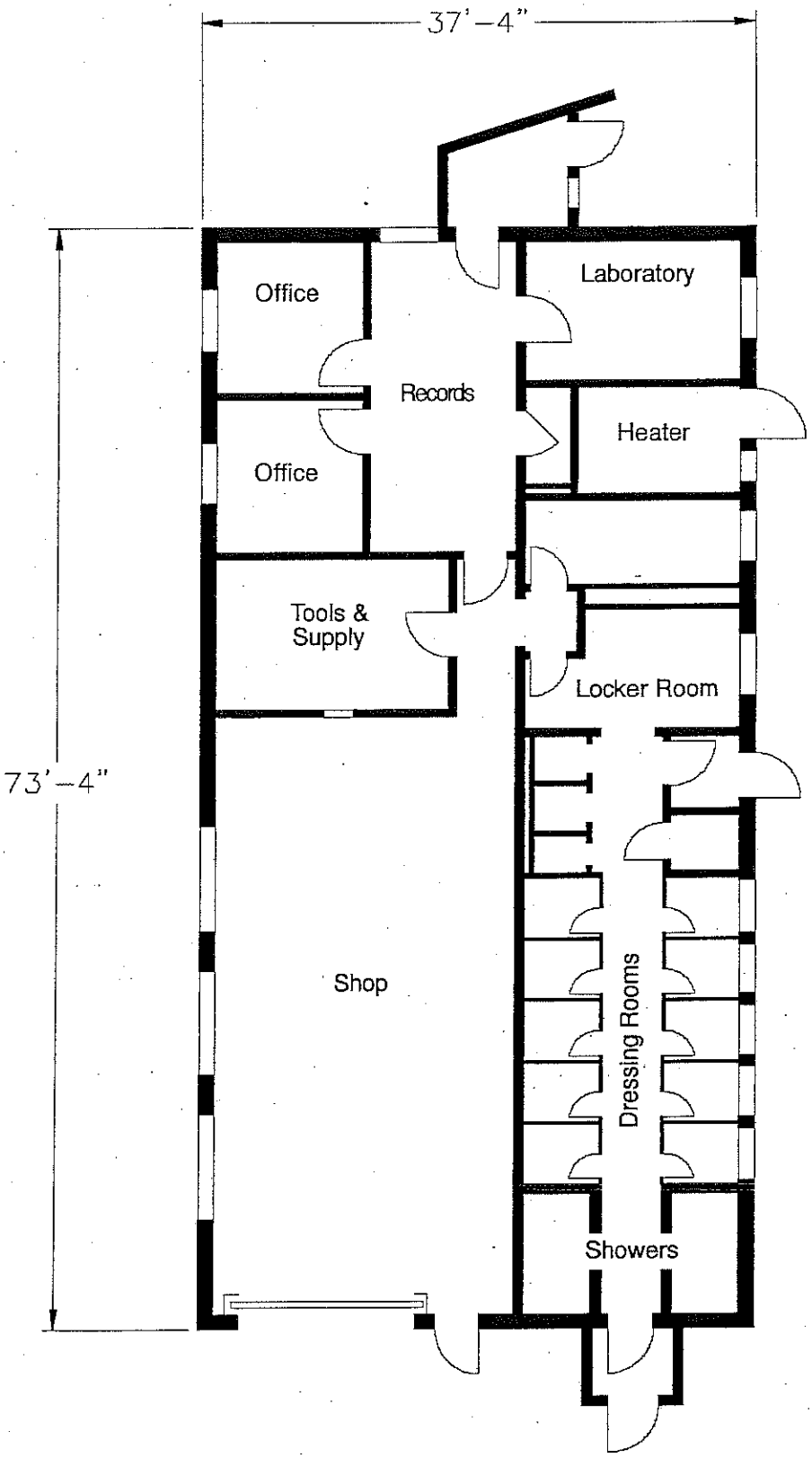
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #-Photo #**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1190-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1190** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Mike Gardner* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1194

Specifications and history are given in the "Cold War Survey".
Facilities in this building consist of:

- Toilet
- Lavatory

An on site inspection was done on 7 Jan 08 with the current facility manager, SSgt Joshua Roberts. In the inspection it was noted that the bathroom is separated from the work area drain. There was no history known. The building is currently being used for storage and it has been used for storage and has been used for storage for the past ten years.
Attachment 55d shows where the leach field for Bldg.1194 was located in 1984.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME: **Building Number:**

Current: Research Equipment Storage.

Historic: Booster Inspection/Unconventional Fuel.

Street Address: 1584 Lethal Rd., HAFB, 88330-7840. **1194**

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1194 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

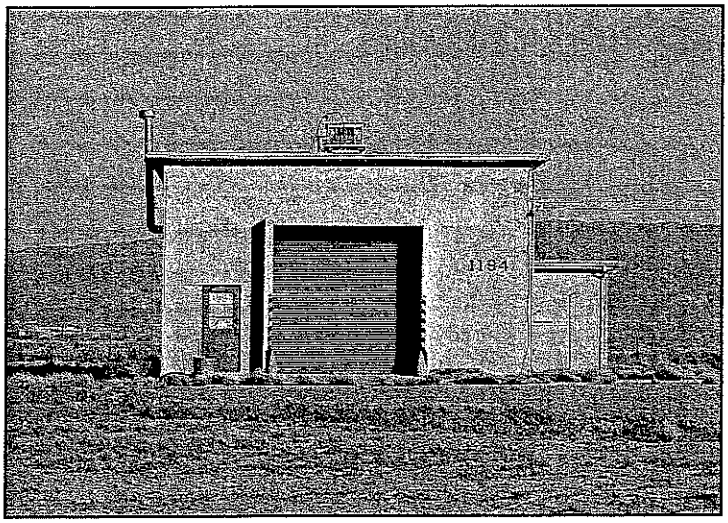
Comments: Interior partitioning is reversible.

Preliminary Determination of National or State Register Eligibility:

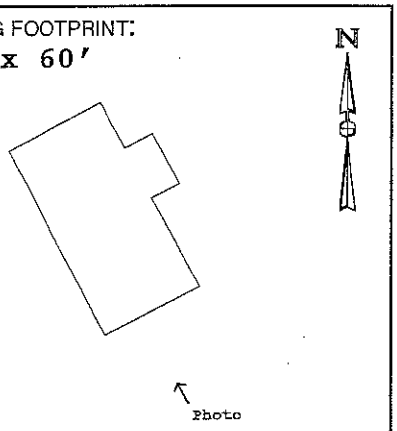
[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.



BUILDING FOOTPRINT:
30' x 60'



Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1194 is a rectangular, single-story, high bay structure made of concrete masonry units (CMU) and exhibiting a flat roof. The principal elevation faces west, showing one large roll-up door, and one personnel door. One row of windows is located below the eave line at the north and south elevations. The ceiling at the interior is exposed. "As-built" construction drawings show that Building 1194 was completed in 1952. W. C. Kruger Co. (Santa Fe, NM) provided the architectural work (1952: CE File 1194). The builder is unknown. No structural modifications to the original structure were noted.

III. HISTORIC AND CURRENT USE:

Current Function: Research equipment storage.

Original Function: Missile Assembly Test Building/Booster Inspection.

Interim Functions: "Mls/Space Rsch Tst" (n.d.); "M/Assembly Test Bldg" (n.d.); "Shp Wpn and Rlse Sys" (c1976); "BE Stor Cv Fclty" (n.d.); "Rsch Equip Stor" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1195-1 (c1952).

Foundation: Poured concrete footings and stem wall. Slab on compacted fill.

Exterior walls: CMU between concrete columns and bond beams.

Roof: BUR gravel. Rigid insulation. 2" concrete deck supported by steel joists.

Notable interior features, including machinery:

4-ton Wright Company chain-operated crane and hoist system, hoist no. 5197, serial no. 4925. The hoist is attached to a runway "I"-beam (crane) supported by steel support beams. Large metal roll-up doors at east and west elevations.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

210

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1194, although not meeting the "exceptional importance" standard, may be eligible for the National Register for its role in early Cold War materiel development once the fifty-year construction date is met in 2002.

VII. ASSOCIATED BUILDINGS:

According to CE File #1195-1 (c1951) *Title Sheet*, Building 1194 was associated with Building 1190 (Change House), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1194 remains essentially as it was constructed c1952. The original floor plan layout included one main room and an equipment room. A small area in the northwest corner of the main room has been partitioned. No documentation was found pertaining to this modification. This minor partitioning of the main room is reversible. This building is no longer associated with either missile assembly and test activities or unconventional fuels storage, and currently serves as an equipment storage room for the 6585th Test Group. Construction drawings (1956: CE File # 1194-1) show that an addition to this building was planned. There is no indication that this addition was ever built. Because this building retains historic integrity, and may be eligible for the National Register under Criteria A and/or C once the 50-year construction date is reached in the year 2002, recommend that future modifications take essential design features into account. Note: One isolated occurrence of prehistoric artifacts was noted on the grounds north of the building, including one white chert core, and one secondary chert flake.

Suggested routine maintenance: Scrape, prime, and paint the exterior. Replace downspouts. Prune landscape plantings away from foundation.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Construction drawings show plans for an addition to the north elevation (1956: CE File #1194-1). There is no evidence that this addition was ever built.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The high open-bay floor plan allowing the crane and hoist system, and the large metal equipment roll-up doors remain as key design elements.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Buildings 1193 and 1194 remain in an unmodified and isolated setting.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Nearly all of the historic materials used to construct this building remain visible.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two doors have been replaced. All windows appear to be original. Interior partitions at the northwest corner divide the original floor plan.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Although retaining its original open floor plan, this building is currently used for storage of modern equipment.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

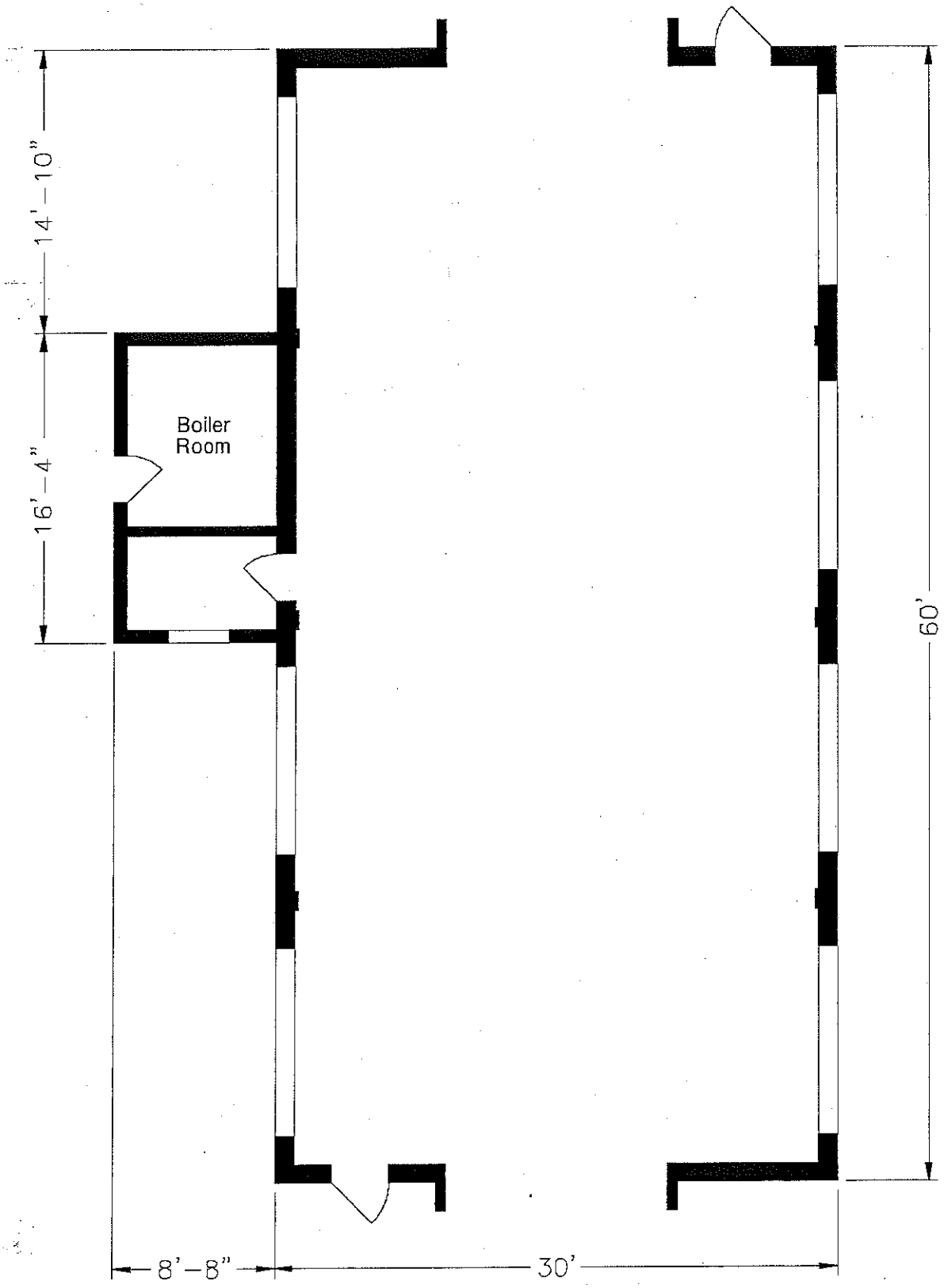
Comments: The open floor plan, isolated setting, hoist system, and nearby continuity check stand (Building 1193) contribute to this building's integrity of association.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #3-Photo #31**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1195-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1194** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1196

This building was constructed in 1956. It originally built for missile assembly, but is now in communications equipment storage.
The original facilities consisted of:

- Toilet
- Lavatory

These facilities were replaced in 1975 with:

- Toilet
- Urinal
- Lavatory

An on site inspection for this building was done on 4 Dec 07 with the current facility manager Sgt Lander. The information gathered from this inspection was that there were not any floor drains located within the building. In the past it was used for TAC can and for the past ten years it has been used for storage.
Attachment 55d shows where the leach field for Bldg. 1196 was located in 1984.

Figure 6: Picture of Bldg. 1196

INACTIVE SEPTIC SYSTEMS

BUILDING 1199

This building was constructed in 1957. It was originally built as a rocket fuel laboratory. In 1987 it was converted to the Security Forces Kennel.
As the fuels laboratory, it contained:

- Toilet
- Urinal
- Lavatory
- Shower

After conversion to the kennel, the facilities were changed to:

- Toilet
- Urinal
- Stainless Steel Sink

During the investigation stage of the project there were drawings found for building 1199. Attachment 12 and 13 are of the Site Plan, the Sewer Isometric, the Plumbing Plan and the Floor Plan.

Along with the drawings that were found an on site inspection was completed on 29 Nov 07 with the current facility manager, SSgt Gilmore. A new Security Forces Kennel area has been built and now the building is currently being used to house animals until they can be transferred to Alamogordo Animal Control.

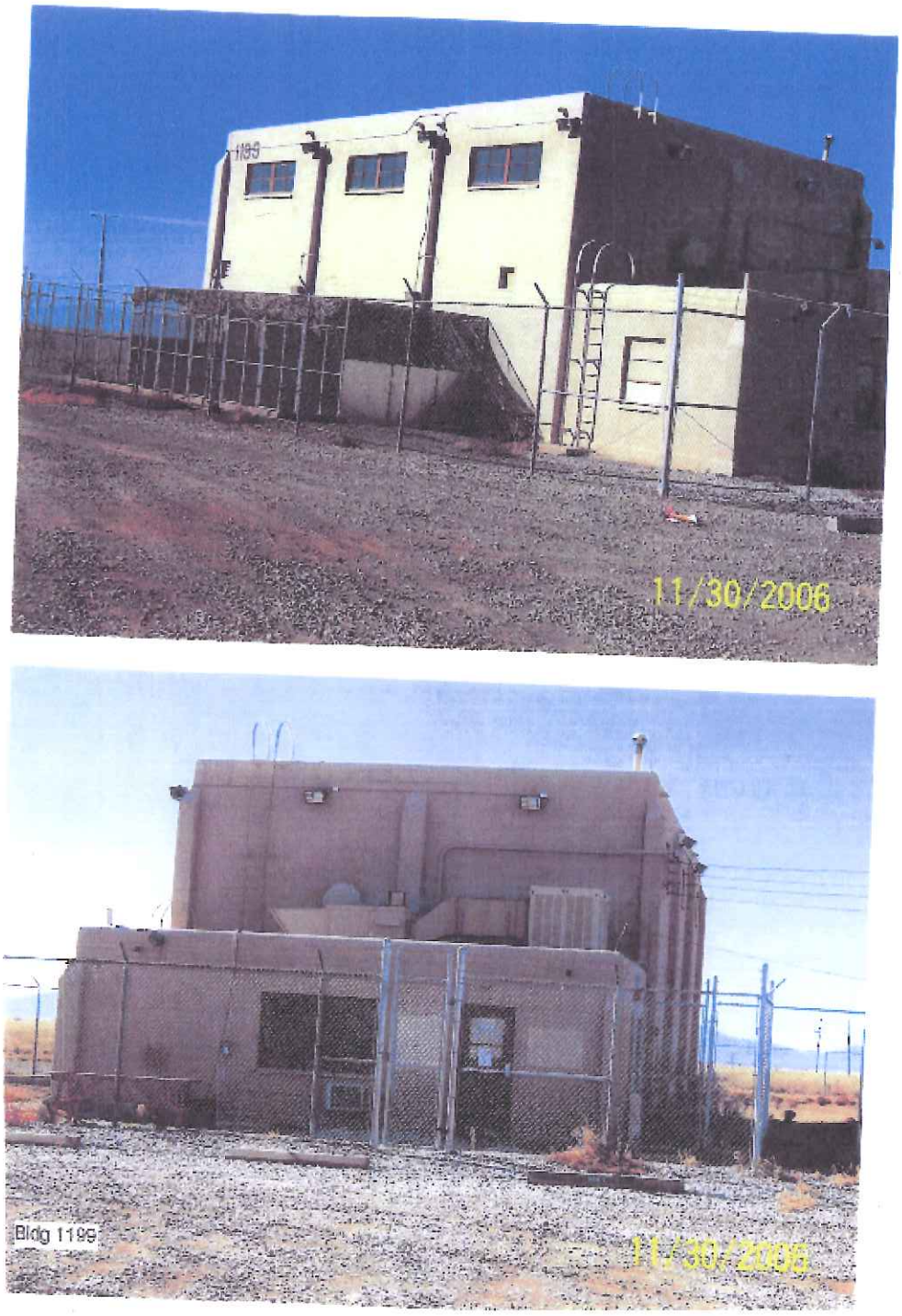


Figure 7: Pictures of Bldg 1199

INACTIVE SEPTIC SYSTEMS

BUILDING 1200

Specifications and History: See "Cold War Survey".

Three drawings were found for this building. These drawings show the Plumbing Floor Plan (Attachment 14), a Floor Plan (Attachment 15) and the Septic Tank and Drain Field (Attachment 16).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab, Medical (VACANT).
Historic: Space Biology Laboratory.
Street Address: 841 Douglas Road, HAFB, 88330-7823.

Building Number: 1200

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [ ] Needs maintenance [x] Deteriorated [ ] Archaeological

Comments: Building 1200 is abandoned, and showing signs of deterioration.

Degree of Alteration: [ ] None [ ] Minor [x] Moderate [ ] Major

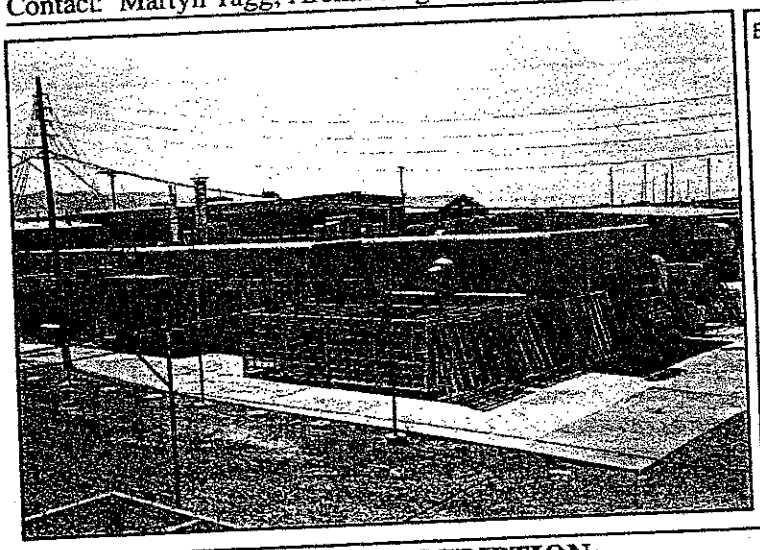
Comments: Alterations are architectural rather than structural.

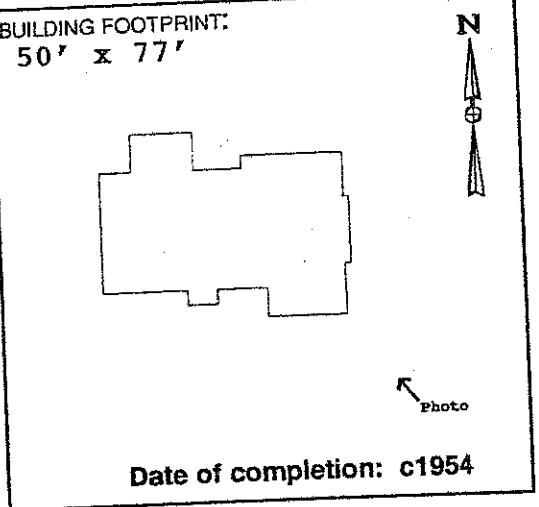
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1200 no longer retains historic integrity. See Section VI.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1954

273

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1200 is a rectangular, single-story, flat-roofed concrete masonry unit (CMU) building constructed as one of several laboratories dedicated to important aeromedical research using both animals and humans. None of the construction drawings were correctly stamped "As-built." According to Real Property Accountable Record/1200, the estimated date of construction is 1954. Subsequent improvements documented in CE File drawer #1200 include an addition to the medical lab (c1958), a covered passageway added to the boiler room (c1957), and a frame wall addition to the surgery room (c1957). Neither the builder nor the architect is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1200; Field visit Summer 1995.

Current Function: Vacant.

Original Function: Space Biology laboratory/Animal experimentation.

Interim Functions: Animal experimentation/Storage.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1200-1 (c1953).

Foundation: Concrete wall footings. Concrete slab on fill.

Exterior walls: Painted concrete masonry units (CMU).

Roof: BUR on concrete deck, supported by metal lathe and steel bar joists.

Notable interior features, including machinery:

Originally used as a medical laboratory, with work tables, work benches, built-in lockers, cabinets, operating tables, x-ray tables, etc.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:

274

One room is currently being used for storage. All medical and laboratory equipment has been removed.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Due to extensive alterations to the exterior, Building 1200 no longer retains historic integrity. Recommend, however, that this building be considered as a contributing feature in a basewide early Cold War National Register of Historic Places Multiple Property nomination.

VII. ASSOCIATED BUILDINGS:

Building 1200 was an integral part of Holloman's aeromedical facilities, including Buildings 1201, 1202, 1203, 1204, 1205, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Since its original construction c1954, Building 1200 has been used as a laboratory and medical facility for a wide variety of research animals, including trout, black bear, dogs, mice, and chimpanzees. Although currently abandoned, this building featured a lead-lined x-ray room, an autopsy room, an observation room, a surgery room, a dark room, and animal pens (c1954: CE File #1200-1). Built-in steel lockers, metal cages, x-ray tables, work benches, food bins, operating tables, scrub sinks, surgical lamps, sterilizers, etc. have been removed. Two exterior doors have been blocked in, and thirteen exterior windows have been blocked in. One exterior door and one exterior window have been added. Interior walls have been added, removed, or relocated. A storage room has been added to the south elevation. Animal cages remain at the west elevation. The presence of dead rodents, foul odors, torn pipe and duct insulation (possible containing asbestos) and peeling paint (possible lead-based) represent hazards to health and safety. Because of the unique and important nature of the research conducted here, recommend that this building be nominated as a contributing feature as part of an HAFB early Cold War National Register Multiple Property nomination.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?
[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.
Comments: The building has been located at its present location since c1954.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?
[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact
Comments: Most of the original doors and windows have been removed. All of the equipment has been removed. Most of the original finishes have been obscured.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting
To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting
Comments: Continues to be situated in an isolated setting with the other Aeromedical facilities.

Materials: To what extent have the original materials used to construct this structure been retained?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Elevations have changed due to modified openings, an addition, and a covered passageway. Interior wainscot and cornice removed, wall tile added.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Exterior walls and cages remain intact. Some architectural features remain. Most of the original interior workmanship has been lost.

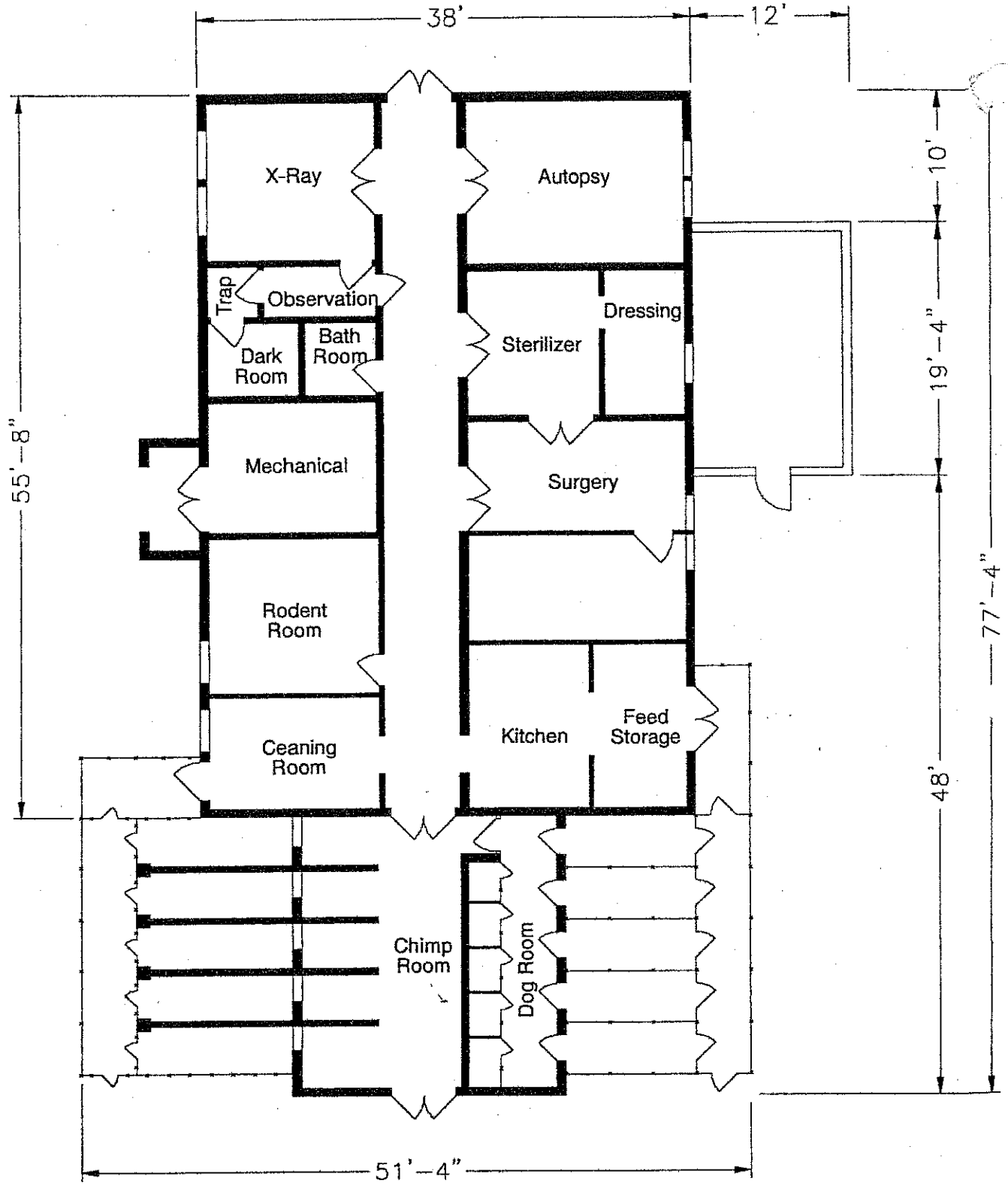
Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?
[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity
Comments: Building 1200 continues to be situated within the compound set aside for animal research. Chimpanzee research continues today in nearby buildings.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?
[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity
Comments: Although all of the equipment has been removed, this building still demonstrates a link with its past by virtue of its setting, the odors, and the animal cages.

X. FURTHER INFORMATION:

Surveyed By:
Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #94**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1200-1 (c1954)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1200** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

BUILDING 1201

Specifications and History: See "Cold War Survey"

Seven drawings were found for this building. These drawings show the Septic Tank and Absorbent Area Layout, Isometric Sewer Layout, Septic Tank Plan and Septic Tank Elevation (Attachment 17), Floor Plan (Attachment 18), Layout Plan (Attachment 19) and Systematic-Waste System (Attachment 20).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab Medical.
Historic: Aero. Medical Field Lab.
Street Address: 821 Douglas Road, HAFB, 88330-7823.

Building Number: 1201

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Structurally intact. In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

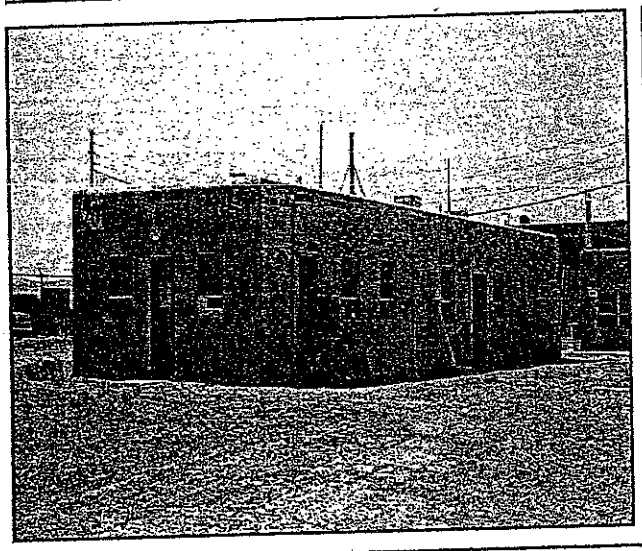
Comments: Mortuary/autopsy room added as subsequent improvement c1958.

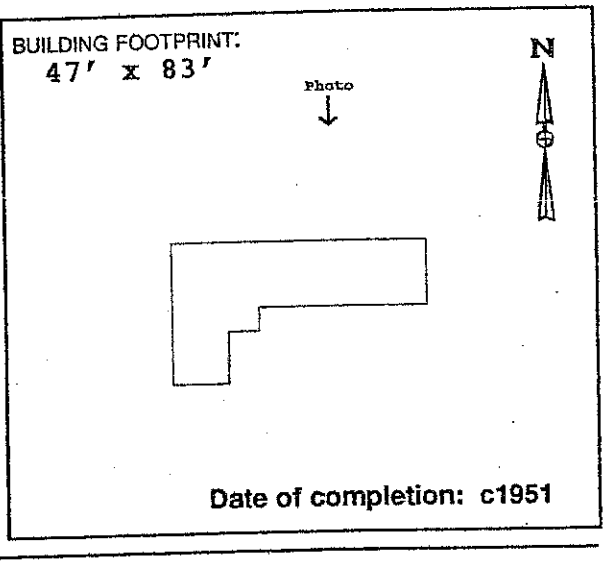
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible under Criteria A and/or C at a national level.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1951

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1201 is an "L-shaped", single-story, flat-roofed, building constructed primarily using painted 8" structural clay tile and exhibiting asymmetrical door and window placement. Animal cages occupy the west elevation. Real Property Accountable Record/1201 indicates that this science laboratory was constructed c1951. The construction drawings consulted were stamped "As-Built," although no date was given. Both the architect and builder are unknown.

At least two structural modifications may be viewed as subsequent improvements to the original building, including the addition of a Mortuary/ Autopsy Room (c1958: CE File #1201-4), and the addition of a rooftop observation deck (c1952: CE File #1201-5).

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1201.

Current Function: Carpentry shop; Employee break room; Office space.

Original Function: Aerospace Medical Lab; Animal experimentation.

Interim Functions: "SC Lab Human Eng" (n.d.); "SC Lab Med (c1968).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1201-1 (c1951).

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted structural clay tile.

Roof: Built-up roof w/ gravel on sheeting, supported by 2x12 wood joists.

Notable interior features, including machinery:

Fixed chain link cages, lab tables, equipment tables, work tables, wood storage bins, sterilizer, incubator.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL: (Based on field visit Summer 1995

[c1958 SUBSEQUENT IMPROVEMENT--MORTUARY/AUTOPSY]:

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted cement masonry unit (CMU).

Roof: 5-Ply built up roof on concrete slab. Steel joists.

278

Notable interior features, including machinery:

Washer and dryer, kitchenette, tool room, table saw, furniture, lockers.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1201 is eligible to the National Register under Criteria A and/or C at a national level of significance for its vital role in early aeromedical research in support of the early Cold War space exploration mission.

VII. ASSOCIATED BUILDINGS:

Building 1201 was associated with the other Aeromedical facilities, including Buildings 1200, 1202, 1203, 1204, 1205, 1206, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1201 retains historic integrity as far as the structure itself goes. Very little physical evidence remains of this structure's original use as an animal laboratory. The cages have been removed. Two interior walls with doors have been added. One interior wall has been removed. Service sinks, work tables, wooden bins, an incubator, and other lab support items shown on c1951 construction drawings have been removed. An area of the original roof approx. 10' x 13' was reinforced with three inches of concrete for observation deck c1952 (CE File #1201-5). A mortuary/autopsy room was added c1958. These additions may be viewed as early improvements, and do not diminish Building 1201's historic integrity. Drawings itemize a "2-body" mortuary room, an autopsy table, a band saw, cabinets, a sterilizer, a photography area, and other laboratory equipment. This equipment has been removed. This room currently serves as a lounge area for employees. Due to the important research conducted here in support of this nation's space program, further research is warranted. Recommend that Building 1201 be included in a Cold War-era Multiple Property nomination. Suggested routine maintenance: This building is showing the signs of long-term neglect. Fill the stress cracks at the exterior corners. Scrape and paint exterior walls. Replace window glass and door hardware as needed.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Continues to be situated in an isolated compound.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Original structure essentially intact. Interior lab equipment and cages removed.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Enclosed by chain link fence topped with barbed wire, along with other research facilities. Chimpanzee research continues in nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Clay tile walls still intact. Some glass block windows remain. Some glass block windows blocked in when addition constructed. Floor tiles removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Roof, walls, and exterior openings remain essentially the same. The east elevation changed due to an early addition. Interior partitions, openings, and finishes have changed.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Historic photographs show that the natural, historic, and aesthetic character of Building 1201 has been retained.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

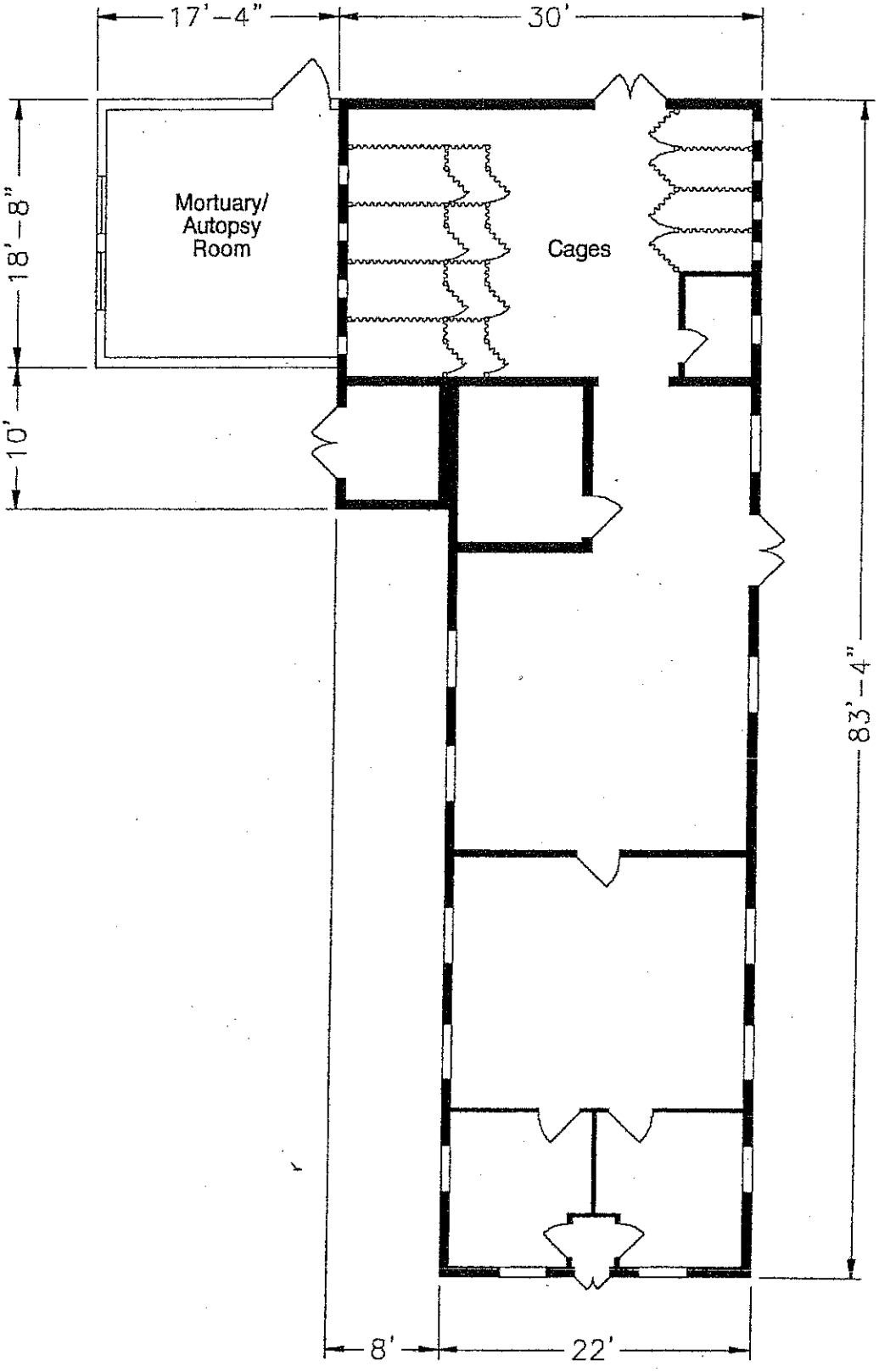
Comments: Building 1201 retains a visible link with its period of significance.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #91**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1995**



280

Source: CE File #1201-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1201** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

Buildings 1219, 1221, 1235 and 1239
An on site inspection was completed on 20 Dec 07 with the current facilities manager, TSgt Pote, he has been the facilities manager for the past nine years. During the inspection it was discovered that there are sink holes on all leach fields in the compound. All buildings in this compound have separate drains for the bathrooms. All buildings are also currently connect to the base sewer system.
Attachment 55d shows the leach field location for Buildings 1219, 1221, 1235 and 1239.

BUILDING 1219

This building is the Administrative Offices for the Munitions Maintenance Squadron. It was constructed in 1985 and covers 4476 SF.
There are Men's and Women's Bathrooms that discharged into two (2) septic tanks prior to the installation of a sewer main that discharges to the Base Waste Water Treatment Plant.

INACTIVE SEPTIC SYSTEMS

Building 1221

This building is in the Ammo Depot and was originally constructed for ammunition storage. It was later switched to store inert munitions.
The building was constructed in 1983 and covers 2857 SF.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan (Attachment 21), Floor Plan (Attachment 22), Partial Plan (Attachment 23), Septic Tank Details and Sewage Disposal System (Attachment 24) and a Profile of Sewer Line Septic Tank and Disposal Field (Attachment 25).

INACTIVE SEPTIC SYSTEMS

BUILDING 1226

This is a munitions maintenance shop building constructed in 1985. It has 2945 SF of floor space.
Facilities installed include:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Utilities Plan (Attachment 26), Plumbing Demolition Plan (Attachment 27), Plumbing and HVAC Plan (Attachment 28) and Waster/Water Piping Detail (Attachment 29).

In Figure 8 on the following page it can clearly be seen where the leach field is in relation to where building 1226. This is the leach field for building 1219, 1221, 1235 and 1239 as well. In Attachment 46 (a map showing many of the building on Holloman AFB) it can be seen where building 1226 is in relation to these building.

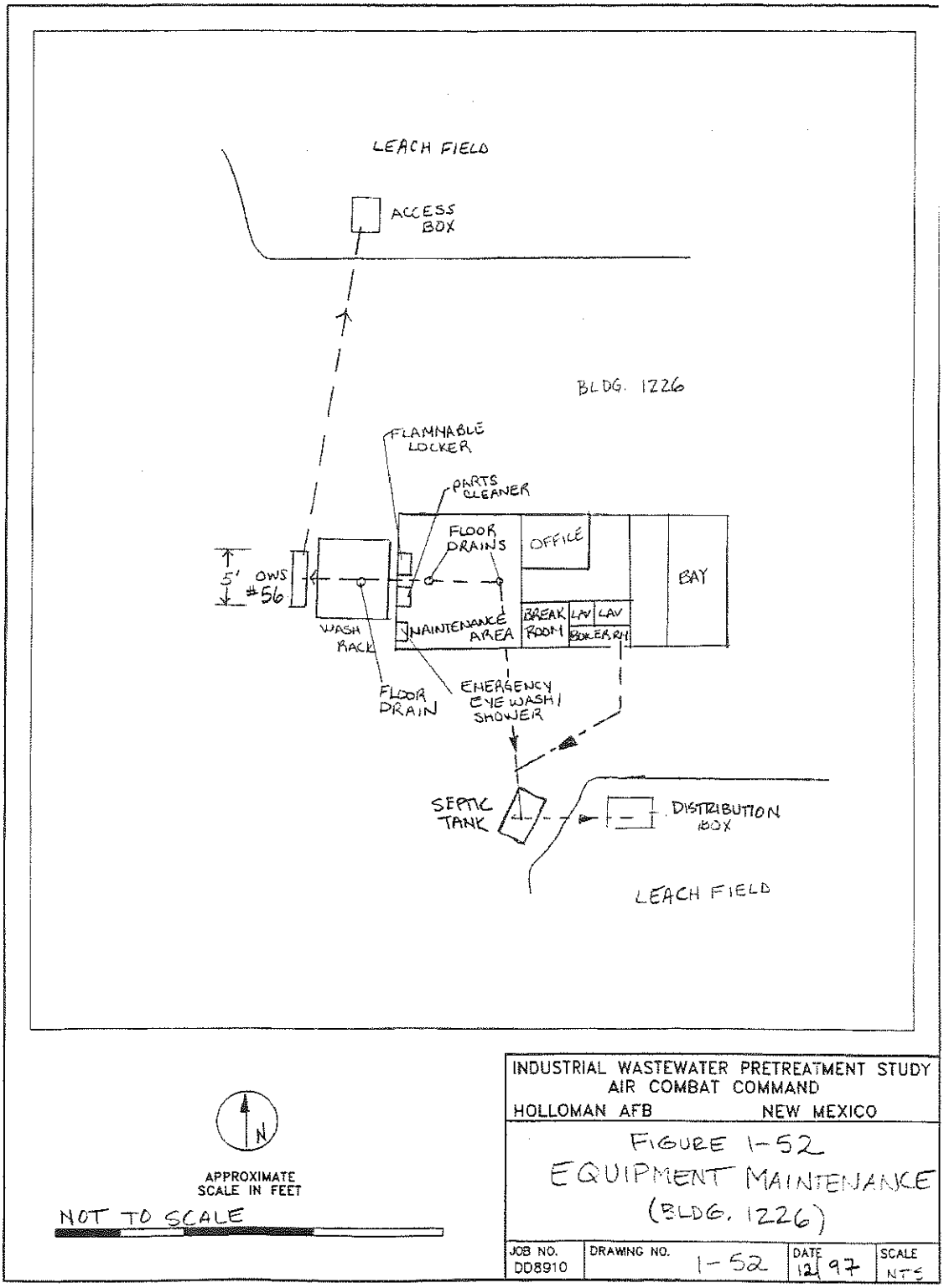


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Figure 8: Drawing of Leach field

INACTIVE SEPTIC SYSTEMS

BUILDING 1235

This building was constructed in 1964 and contains 3000 SF of floor space.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, a drawing for this building was also located. This drawing (Attachment 30) shows the Site Plan, Septic Tank Details and Sewer Clean Out.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST

INACTIVE SEPTIC SYSTEMS

BUILDING 1239

This is another building in the Ammo Depot. It was constructed in 1971 and contains 1920 SF.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Urinal
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan, Septic Tank Details, Utility Plan (Attachment 31), Floor Plan (Attachment 32), Grading Plan (Attachment 33) and Lavatory Detail (Attachment 34).

INACTIVE SEPTIC SYSTEMS

BUILDING 1250

This building was constructed in 1957 and contains 2890 SF.
It was originally a water pumping station. In 1985 it was changed into a storage facility. As part of the change in service the bathroom facilities were removed. Currently it has a large infestation of vectors and it is unsafe to go inside. The POC for this building is Mr. Chuck Price.
The original facilities consisted of:

- Toilet
- Lavatory
- Floor drains for the water pumps

INACTIVE SEPTIC SYSTEMS

BUILDING 1251

This building was constructed in 1965 and contains 1300 SF.
In the records it is listed as a Research and Testing Shop. It currently has a large infestation of vectors, therefore it is not safe to go inside. The building has been vacant since the mid 90's. The point of contact for this building is Mrs. Eisele.
It contains the following facilities:

- Toilet
- Lavatory

INACTIVE SEPTIC SYSTEMS

BUILDING 1269

This building was constructed in 1966 and contains 3262 SF.
The original service was a Medical Science Laboratory. It has been relegated to a storage facility.
The facilities consisted of:

- Toilet
- Lavatory
- Kitchen Sink with Garbage Disposal

Site Specific Contingency Plan: See Attachment 1

Max. Spill Quantity (gal): 55

Chemical	Container Type
Benzene	NA
Acetonitrile	

REMOVED SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	1102	1952	6'x4'x8'10"	2500
2	1103	1948	7'x9'x3'2"	1412
3	1108	1958	6'x9'6"x6'3"	750
4	1119			
5	1150	1953	4'x9'x6'3"	2500
6	1154			
7	1166	1960		450
8	1175	1949	5'1"x10'4"x6'10"	2970
9	1176	1959		640
10	1265	1992		1200
11	1173			

REMOVED SEPTIC SYSTEMS

BUILDING 1102

Specifications and History: See "Cold War Survey." More information can be seen in the drawings. The drawings that have been found for this building are as follows the Grading Plan (Attachment 35), Septic Tank Details and Boring Log Results (Attachment 36), Leaching Well and Cover Details and Sewer Clean Out (Attachment 37).

Attachment 55c shows where the leach field was located for this building in 1984.

This building has the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Missile Radar Station.
Historic: Radar Triangulation: King I.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1102

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

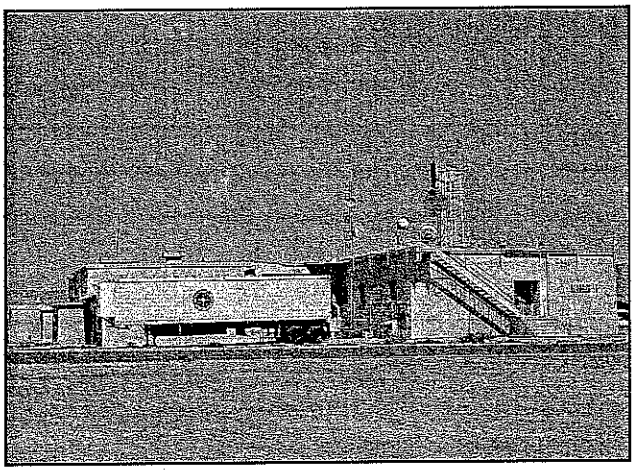
Comments: Essential structural and architectural features remain intact.

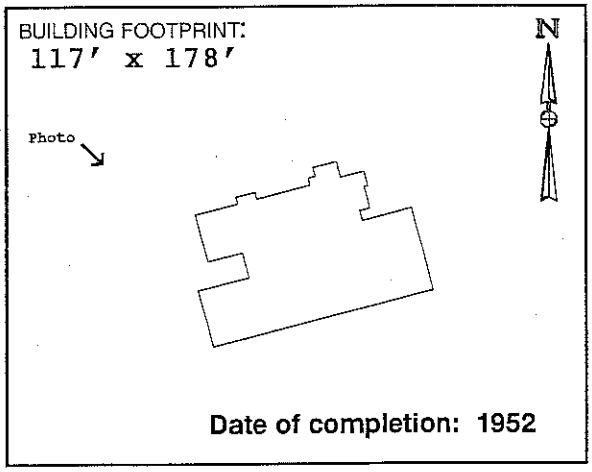
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Recommend listing as part of a Cold War Multiple Property.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1102 is a one-story concrete masonry unit, multi-shaped building with a central corridor running east-west the entire length and single rooms flanking both sides of the corridor. Original footprint shows primarily rectangular shape with a central projecting core. This core is a large open room with an upper balcony around its perimeter. Construction of the original building was completed in 1952, according to "As-built" drawings in CE File #1102-1. Surveillance display room added in 1969 (CE File #1102-1). It is unclear when north elevation additions constructed, although information in Real Property Accountable Record/1102 date the additions as being post-1970. The architect for this project was W. C. Kruger (Santa Fe, NM). The builder is unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1102.

Current Function: Telemetry and Optics. Altitude measurements.

Original Function: Missile Instrumentation Station; Mission Control.

Interim Functions: Missile Radar Station.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1102-1 (c1952).

Foundation: Concrete footing and foundation wall. Column spread footing.

Exterior walls: Concrete masonry units (CMU).

Roof: Bituminous concrete over built-up roof, ltweight concrete, supported by one-way concrete slab using concrete beams and steel beams encased in concrete.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

380

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Eligible under Criteria A and/or C at a national level of significance for important role in early Cold War-era missile and High Speed Test Track mission control and tracking. Further research recommended.

VII. ASSOCIATED BUILDINGS:

Building 1102 supported all missions at White Sands Missile Range and at Holloman Air Force Base until Building 300 and possibly 1527 at White Sands were constructed.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1102 continues to operate as a mission control building, with mostly optics and telemetry functions. The Flight and Instrument Control Room, and the Surveillance Radar rooms are vacant. Originally, missiles were fired using an analog boards (mechanical) system. When operations changed to a digital system in c1978, support moved from the central instrument control room to the north addition off of this room. Nearly all of the original interior finishes remain unchanged.

Suggested routine maintenance: Scrape, prime, and paint all block and concrete surfaces. Remove vegetation and rusted pipes by gas meter. Fill depressions at foundation, and regrade using gravel to promote positive drainage. Fill holes at concrete stoops. Replace wood bumper at dock using similar-sized lumber. Secure panel covers on abandoned electrical panels. Enclose live connections in junction boxes. Scrape, prime, and paint metal stairs. Reattach stair nose treads. Remove miscellaneous debris from building perimeter.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Still situated at the northeast corner of the intersection of Tula Peak Road, and Douglas Road.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The original floor plan remains intact.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Continues to be situated at the intersection of two roads in an isolated setting with few nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Most all original materials have been retained at both the exterior and the interior.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: All original exterior and interior room finishes remain visible. At the south elevation, one window is blocked, one window has been replaced with a door, and the door at the loading dock has been replaced. Most of the north elevation is obscured by the addition of an operations room.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1102 continues to support limited mission control operations.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

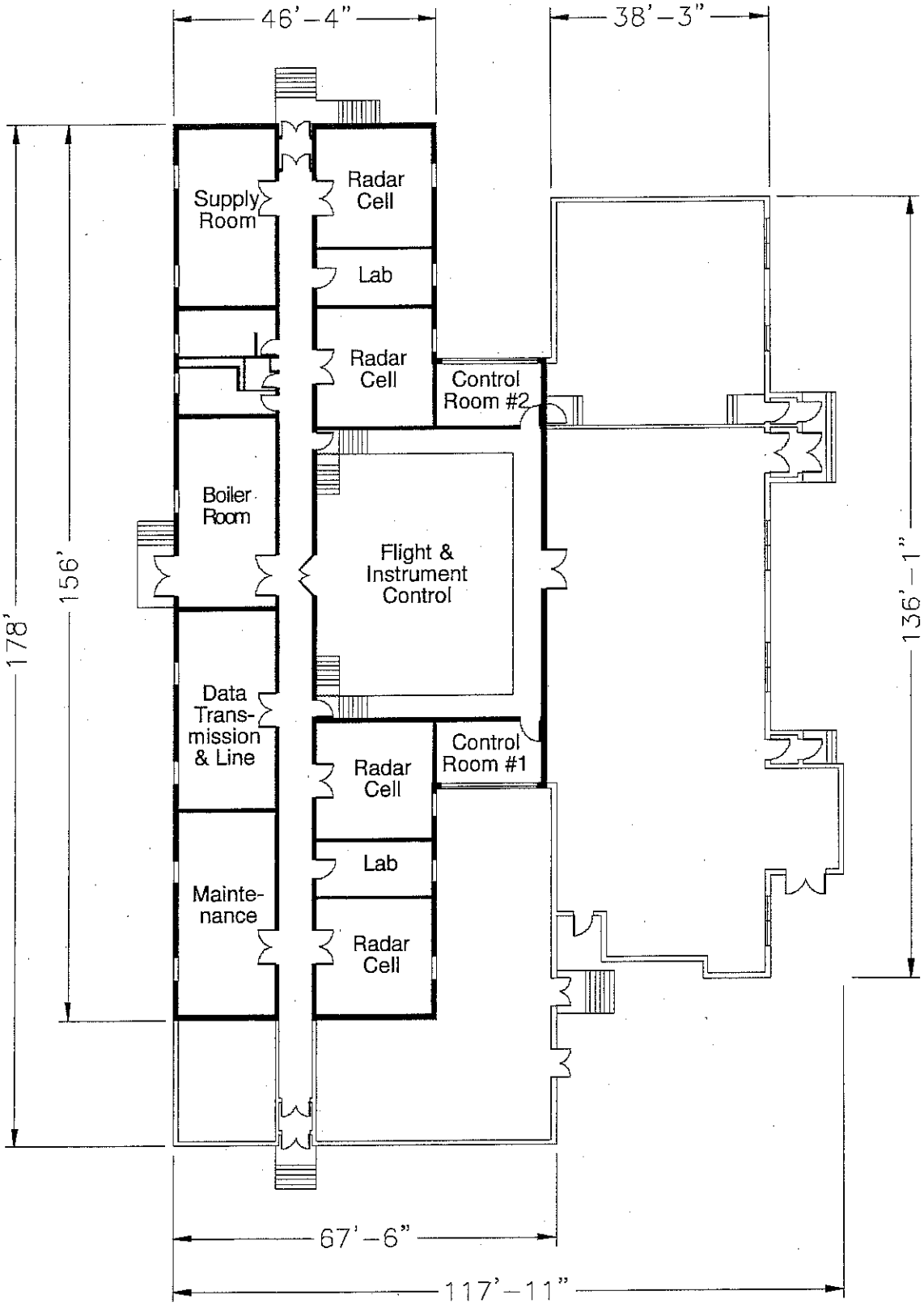
Comments: Building 1102 retains an evident link with its aesthetic and functional historic character.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #49**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1102-1 (c1952)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1102** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-6401* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1103

Specifications and History: See "Cold War Survey" the Layout Plan (Attachment 38) has also been provided.

Attachment 55c shows where the leach field was located for this building in 1984.

Facilities: This building contains the following facilities.

- Tiolets-2
- Urinals-2
- Lavatories-3
- Service Sinks-3

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Timing.
Historic: Telemetering Building.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1103

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance only.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

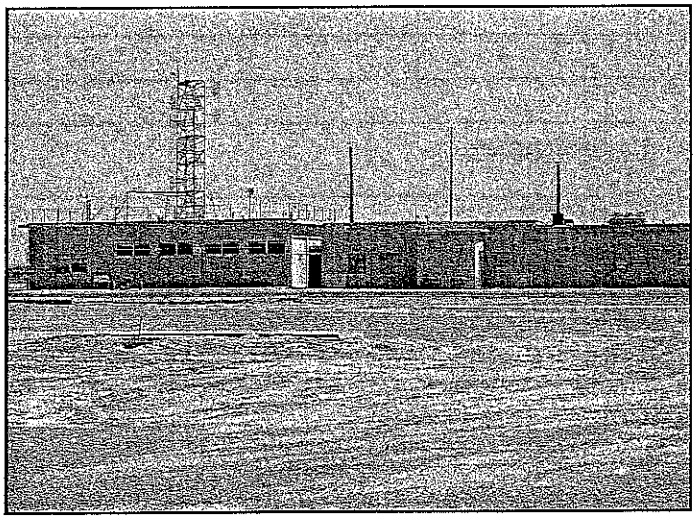
Comments: Few alterations since early improvements.

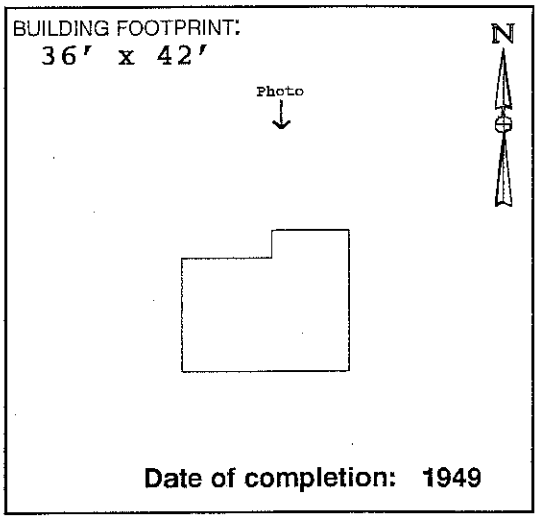
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Research recommended to determine historic use. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1103 is a one-story rectangular building with concrete masonry unit walls, and a flat roof. The original building was completed in 1949, according to "As-built" drawings located in CE File #1103-1. This original construction is centrally located, flanked to the east and west by subsequent additions. Real Property Accountable Record/1103 documents the addition of 2,930 square feet to the original building with the notation "Subsequent Improvements thru May 57." One or both additions to the original building may therefore be considered to be subsequent improvements, rather than additions that compromise historic integrity. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE: (Personal communication with Building 1103 personnel)

Current Function: (East end) Leased by WSMR to transmit mission timings.

Current Function: (West end) Unknown.

Original Function: Telemetering station for data collection of Range missions.

Interim Functions: Real Property Accountable Record/1103: "Communications CTR" (c1962); "Telecom Cen" (c1971); "Comm Fclty" (c1980); "Elec Rsch Rdr" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1103-2 (1967); CE File #1103-1 (1949).

Foundation: Concrete wall footing.

Exterior walls: Painted concrete masonry units (CMU).

Roof: Built-up roof on wood sheathing and 2 x 8 wood joists.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Although perhaps not meeting the "exceptional importance" stipulation imposed on buildings constructed within the last fifty years, Building 1103 may be eligbile for the National Register under Criterion A at a regional or national level in the year 1999. If further research determines that Building 1103 is not eligible as an individual property, consideration should be given to its eligibility as a contributing feature in a Cold War Multiple Property submission for its support of early Cold War-era test launches.

VII. ASSOCIATED BUILDINGS:

Building 1103 was associated during its historic period of significance with Building 1102, mobile data collection vans, and Building 300 at White Sands Missile Range.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1103 appears very different today from depictions on "As-built" drawings dated 1949. It is unclear whether additions to the east and west ends of the original building represent early improvements to the original building, or whether these additions represent later construction that has compromised the historic integrity of the original building. Information obtained from Real Property Record/1103 and field visits seems to indicate that the additions represent early improvements to the original building. If so, Building 1103 retains historic integrity. Further research is needed to verify the construction sequence, and to verify what early Cold War-era research activities were supported by Building 1103. Currently, Building 1103 is leased by the White Sands Missile Range. Aside from minor partitioning at the telemetering room, the original floor plan of the original building shows no alterations. Wood posts (6 x 6) that appear on original drawings to support the roof girders have been removed.

Suggested routine maintenance: Repair, or replace in kind, the exterior wood architectural features, including the soffit, fascia, wood doors, and louvers. Patch spalling concrete at foundation. Remove vegetation at roof.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Original telemetering room is now used as spare equipment storage.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Earlier location plans indicate three utility buildings situated in a row next to Building 1103 to the east. These buildings have been removed. Continues to be set in a somewhat isolated setting, in the vicinity of King-I.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Unable to access some rooms. Those rooms that were accessed, however, appear to have most of the original materials intact. A brick chimney and a metal stack have been removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original windows at north elevation have been covered up at the interior. The telemetering room has been partitioned (reversible).

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity

Comments: Building 1103 personnel are actively engaged in serving as a timing link for White Sands Missile Range tests.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

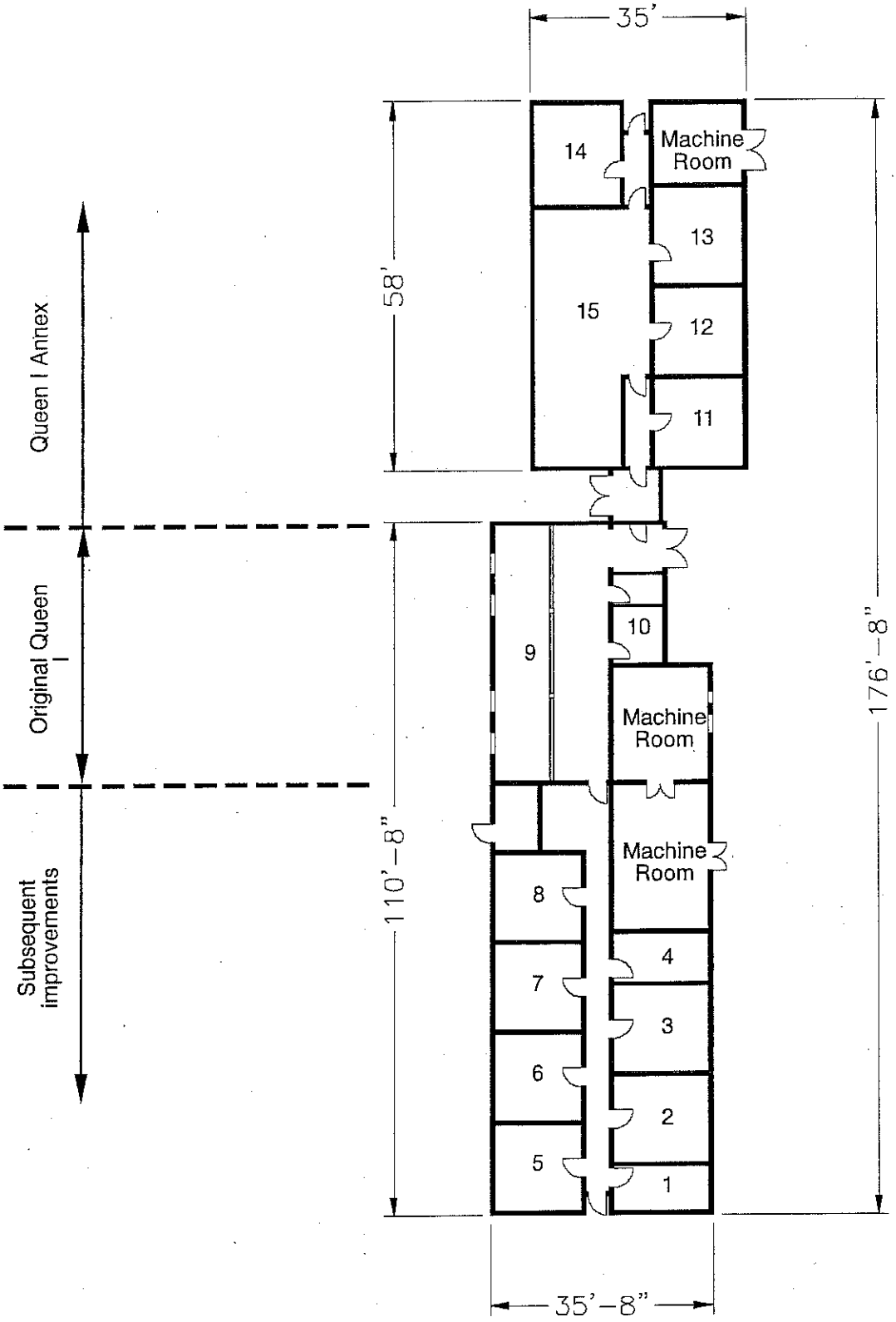
Comments: Building 1103 continues to provide support to the White Sands Missile Range.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #47**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: Dynalectron *Facilities Handbook*, c1964.

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1103** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1108

This building was constructed in 1958 and contains 2626 SF of floor space.
The building was originally built to serve as the telephone exchange. In 1980 it was retitled as a communications facility.
The building contains the following facilities:

- Toilet
- Lavatory
- Janitorial Sink

The drawings provided (Attachment 39-40) show a Utility Plot Plan, Septic Tank Details, Sewer Clean Out, Toilet Room Details and Plan Details.

Attachment 55e shows where the leach field was located for this building in 1984.

Site Specific Contingency Plan: See Attachment 1 and 2

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate into local area on ground

Tank location: North of facility

Fuel Flow - North

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST
MOGAS	250 gal each/ 2 /AST

REMOVED SEPTIC SYSTEMS

BUILDING 1119

This is an Army owned building that contains 2224 SF of floor space. Use and maintenance of the building was transferred to the Air Force in 2005. Prior to the Air Force taking possession the Army had delegated the building to the GSA for use as a vehicle maintenance shop. Once the Air Force took over, the building changed service to an electrical shop and storage facility.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
Diesel	250 gal ea/ 3 /AST
MOGAS	250 gal ea/ 2 /AST
Diesel	750 gal ea/ 3 /AST

Figure 9: Picture of Bldg 1119

REMOVED SEPTIC SYSTEMS

BUILDING 1150

This is also an Army owned building and therefore details are lacking from Holloman's records. The building has 2844 SF.
The original service is unknown, but since the Air Force started using the building it has been used as storage space.
It contains the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 9: Drawing of Bldg 1150

REMOVED SEPTIC SYSTEMS

BUILDING 1154

This is an Army owned building and there is no information in Holloman's files pertaining to this building.

Attachment 55c shows where the leach field was located for this building in 1984.

REMOVED SEPTIC SYSTEMS

BUILDING 1166

This building was constructed in 1960 and contains 4955 SF. The structure is a Test Track Shop/Storage Building known as the "Break Setter Building".
The facilities include:

- Toilets-2
- Urinal
- Lavatory
- Shower

Attachment 41 is a drawing showing the sewer layout and the septic tank details.

Attachment 55c shows where the leach field was located for this building in 1984.

Site Specific Contingency Action: See Attachment 3

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate in local area on ground; if full tank or drum spilled' the substance may reach open ditch.

Material Compatibility: No material incompatibilities

Chemical	Container Type
Oil/Water Separator Waste	500 gal/ 1 / UST

Figure 10: Picture of Bldg. 1166

REMOVED SEPTIC SYSTEMS

BUILDING 1175

Specifications and History: See "Cold War Survey"
Facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

In Attachments 42-44 a trench pit, the toilet room details, the trench junction to UPS, the sanitary sewer manhole and water and sewer piping can be found for Bldg 1175.

Attachment 55c shows where the leach field was located for this building in 1984.

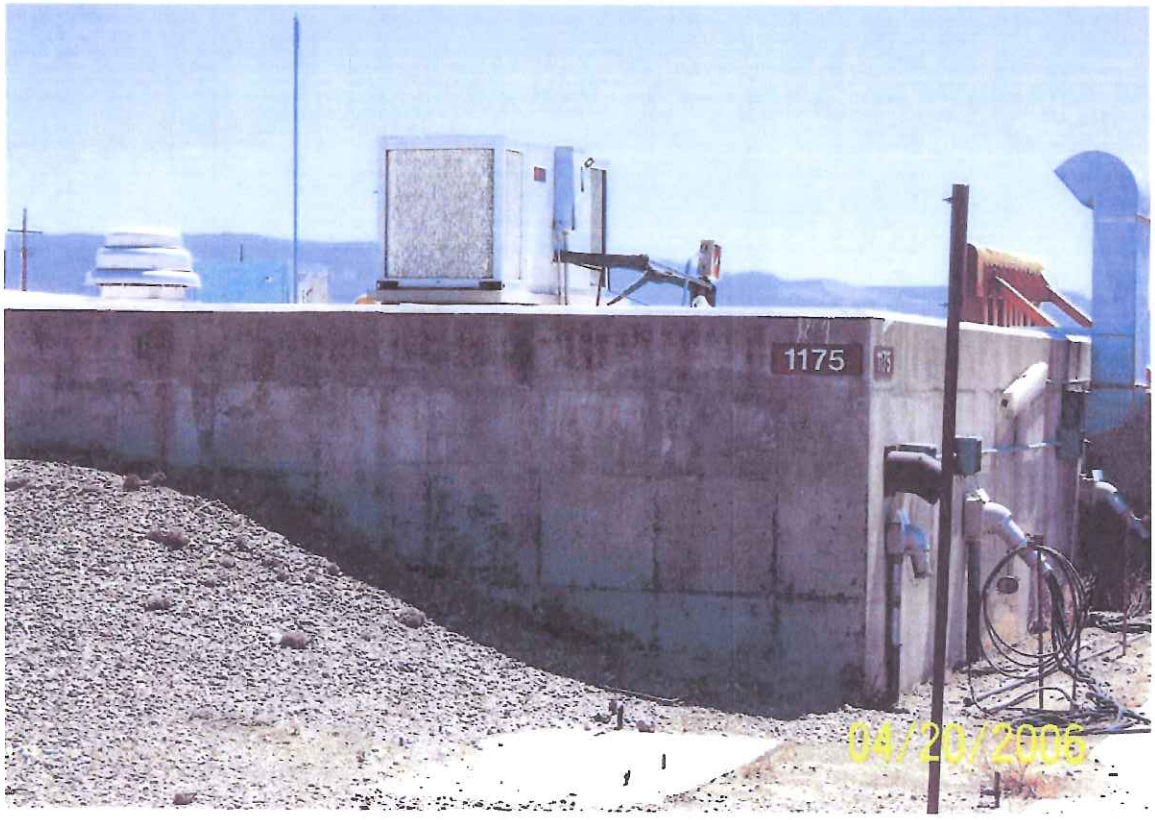


Figure 11: Picture of Bldg 1175

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Blockhouse--"Alpha".
Historic: Blockhouse--"Alpha".
Street Address: 1656 Test Track Rd., HAFB, 88330-7848.

Building Number: 1175

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1175 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

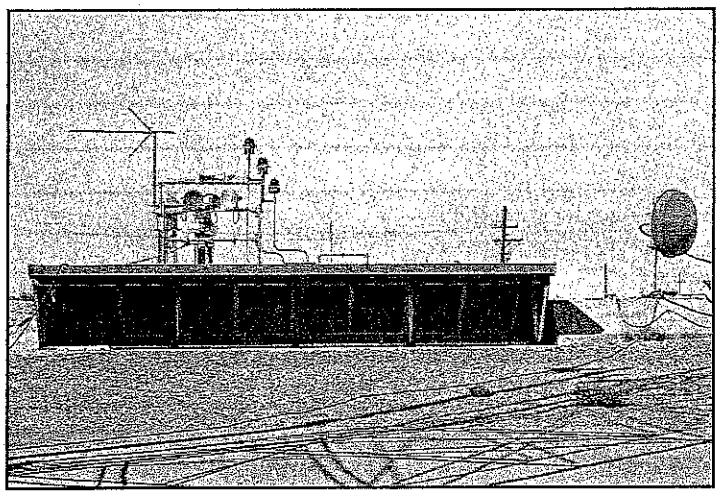
Comments: Modernization at interior to enable continued Test Track use.

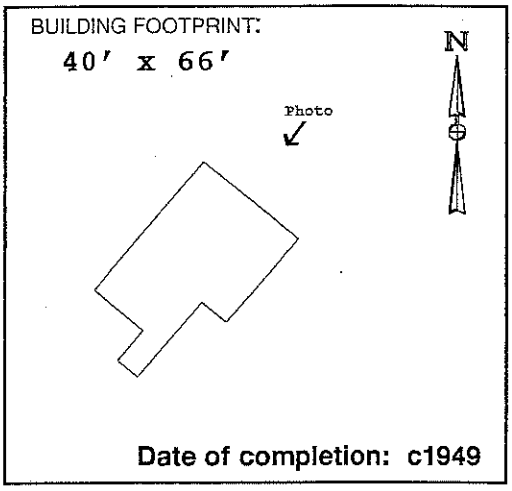
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible for the National Register under Criteria A and/or C.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1175 is an irregularly shaped, one-story concrete structure, built mostly below grade. The building is accessed by a ramp leading down to double doors at the southwest elevation. These doors access the original launch control room constructed in c1949. This entrance, three entrances off of the ramp, and windows facing the track (northeast) are the only visible openings. A 15′ x 32′-6″ addition was constructed at the northwest elevation in 1960 (CE File #1175-2). Another addition, adjacent to northwest side of ramp was completed in 1981 (CE File #1175-3). The ramp extension was also constructed at this time. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1175; CE File #1175-1 (c1949).

Current Function: Launch control facility, High Speed Test Track.

Original Function: Launch control facility, High Speed Test Track.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1175-1 (c1949); CE File #1175 (c1980).

Foundation: Concrete footings.

Exterior walls: Reinforced concrete.

Roof: 3-foot thick reinforced concrete.

Notable interior features, including machinery:
A long row of thick blast-proof windows faces the track to the northeast.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

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VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

"Alpha" Block house Building 1175 is one of the original High Speed Test Track support facilities, constructed c1949 to provide launch control. Recommend that Building 1175 be nominated under Criteria A and C as part of a basewide early Cold War Multiple Property listing.

VII. ASSOCIATED BUILDINGS:

Building 1175 operated, and continues to operate, in support of the high speed test track launching activities, along with Buildings 1162, 1163, 1161, 1645, and the Horizontal Test Stand facility (Buildings 1159 and 1160).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1175 retains historic integrity. Due to its national level of significance under Criteria A and C, recommend that Building 1175 be listed along with the other test track support buildings as part of a Multiple Property nomination to the National Register of Historic Places.

Subsequent improvements to the original Building 1175 augmented the original design and function as a launch control facility for important research conducted at the high speed test track. The interior was renovated in 1984 (CE File #1175-4). Although this renovation obscures original interior finishes, Building 1175 as a whole retains historic integrity of location, design, setting, workmanship, materials, feeling, and association. Of interest to future researchers may be the dramatic changes in computer technology which have occurred since the construction of Alpha Blockhouse: Computers which at that time required several rooms to house, now occupy considerably less space. Launch control operations continue at Alpha Blockhouse, although rooms designed to hold early equipment are virtually empty.

Suggested routine maintenance: Repair bond beam where steel is exposed. Remove vegetation at exterior embankments. Remove debris at front walkway.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Subsequent improvements to the original floor plan added to Building 1175's design and function as a launch control facility.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Except for the construction of smaller buildings in the vicinity, the original setting of Building 1175 near the test track launch pad has been retained.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: The raised wood floor in the console room has been removed. The original light fixtures have been removed. One wood and glass partition has been removed. Sheetrock® walls, carpeting, wainscot, and linoleum have been added to the control room.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original workmanship at the northeast elevation, and at the entrances at the ramp is still visible. Interior renovations hide the original architectural craftsmanship.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1175 continues to function as a launch control facility for the High Speed Test Track.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

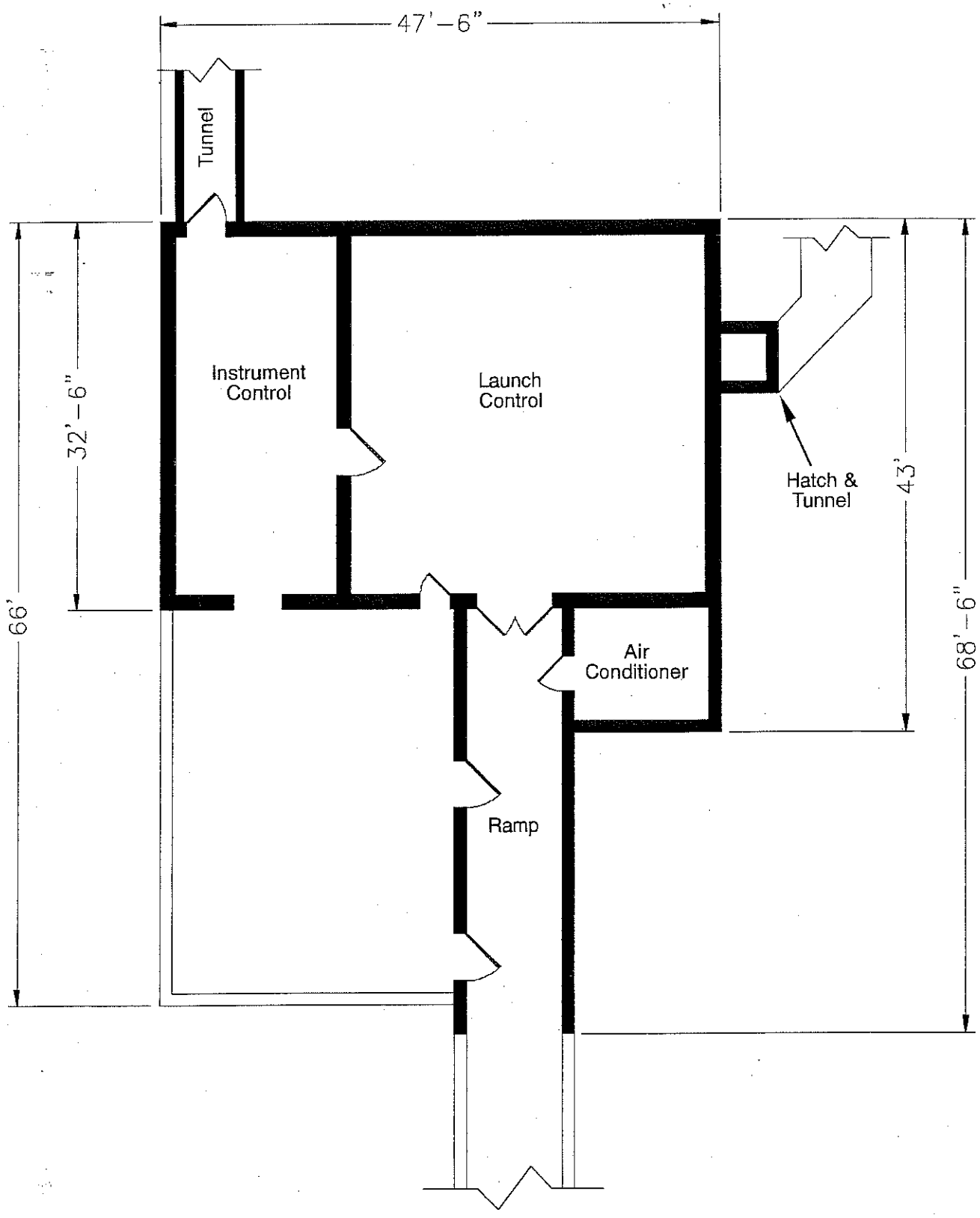
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #35**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1175 (c1980)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1175** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1176

This building was constructed in 1959 and contains 3850 SF.
The building is located at the Test Track and is known as the Sled Launch Shop.
Facilities include:

- Toilet
- Lavatory
- Shower

In Attachments 45-48 a plumbing plan, new drain pit, utility plan, sewer clean out, utilities contour plan and septic tank details can be found for Bldg 1176.

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 12: Picture of Bldg 1176

REMOVED SEPTIC SYSTEMS

BUILDING 1173

This building was constructed in 1957 and contains 17,428 SF.
The building is the main office building at the Test Track.
It contains the following facilities:

- Toilets-8
- Urinals-4
- Lavatories-9
- Janitorial Sinks-2

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 13: Picture of Bldg 1173

REMOVED SEPTIC SYSTEMS

BUILDING 1265

This building was constructed in 1957 and covers 43,388 SF.
This is the Inertial Guidance Facility, previously known as the Guided Weapons Lab.
The building contains the following facilities:

- Toilets-12
- Urinals-6
- Lavatories-12
- Janitorial Sinks-5

This building has been attached to the sewer system at Holloman AFB since before 1984.

In Attachments 49-53 a Water Piping Diagram, Partial Plumbing Plan, Floor Plan, Building, Pavement and Utilities Layout, Sewer Clean Out, and Enlarged Plan can be found for Bldg 1265.

North Wind

Letter No. NW-2008-155

Mr. Dave Griffin
Project Manager
49 CES/CEV
550 Tabosa Ave.
Holloman AFB, NM 88330-8458

11 March 2008

SUBJECT: Technical Memorandum summarizing the decommissioning of inactive septic tanks at HAFB in January of 2008

Dear Mr. Griffin:

Reference Contract Number: W9128F-04-D-0017 DO-0017

Attached please find a copy of the above referenced Technical Memorandum and attached State of New Mexico On-Site Liquid Waste System Abandonment forms. Also attached are copies of the daily reports for the field work.

Please contact me (phone 785-838-3141 or email at tmatzen@northwind-inc.com) or the Program Manager, Rusty Gilbert (phone 210-722-4074 or email at rgilbert@northwind-inc.com) if you have any questions.

Sincerely,

Thomas A. Matzen, P.G.
Project Manager
North Wind, Inc.

Attachments: Technical Memorandum summarizing decommissioning work conducted on inactive septic tanks at HAFB

cc: R. Gilbert (North Wind)
Mr. Tom Zink (USACE Omaha District)
Letter File

North Wind

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
9	1194	01/09/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
10	1196	01/08/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
11	1199	01/09/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
12	1200	01/11/08	No septic tank located. Did locate abandoned earthen pit with a concrete cover. Notified Base POC of situation and received instructions to backfill and abandon.	Removed concrete cover over pit and backfilled pit with clean fill.
13	1201	01/11/08	No septic tank located. Did locate an old abandoned treatment plant. Notified Base POC of situation and received instructions to decommission and backfill the old treatment plant.	Demolished old treatment plant by crushing bottom and caving in sides, then backfilled with clean soil.
14	1219	01/18/08	Septic tank still in use	Notified Base POC that system is still in use
15	1221	01/18/08	Located abandoned septic tank.	Opened tank, pumped out, crushed bottom, and backfilled tank.
16	1226	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.
17	1235	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.
18	1239	01/17/08	Septic tank is still in use. Base POC notified NWI that septic tank will have to remain active.	No action taken.

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
ON-SITE LIQUID WASTE SYSTEM ABANDONMENT

NMED Permit No.: N/A

System Owner's Name: USACE

Address: HAFB BUILDING 1221

BUILDING SEWER:

_____ Connected to Sewer Lines or Plugged/Capped based on UPC Requirements

ON-SITE LIQUID WASTE SYSTEM TYPE:

- [x] Septic Tank
- [ ] Seepage Pit
- [ ] Sec./Tert. Treatment Unit
- [ ] Other:
- [ ] Holding Tank
- [ ] Cesspool

ABANDONMENT PROCEDURE:

- [x] System Pumped
- [x] Bottom of System Opened or Ruptured or Unit Collapsed
- [x] System filled with Earth, Sand, Gravel, Concrete, or Other Approved Material
- [x] Top Cover Removed or Collapsed
- [x] System Filled to the Top of Sidewalls or above the Level of any Outlet Pipe
- [x] System Filled Level with Top of Ground Surface

COMMENTS/VIOLATIONS:

Elevation GPS: N32 87627
4208 Ft W 106.07716

ABANDONMENT PERFORMED BY:

Company Name: Dental Septic Company

Address: PO Box 927 Los Lunas NM 87031

NMED ACTION TAKEN:

- [ ] Abandonment **Approved**
- [ ] Abandonment **Approved w/conditions** (See Comments/Violations)
- [ ] Abandonment **Not Approved** (See Comments/Violations)

FINAL APPROVAL:

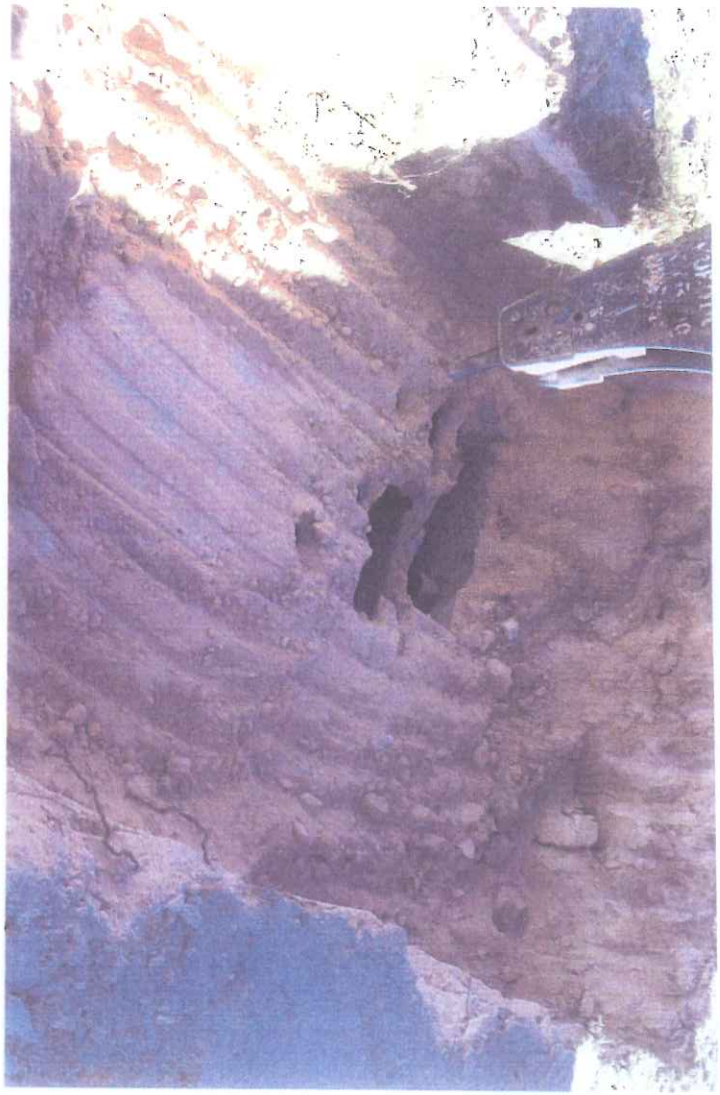
- [ ] Granted
- [ ] Not Granted

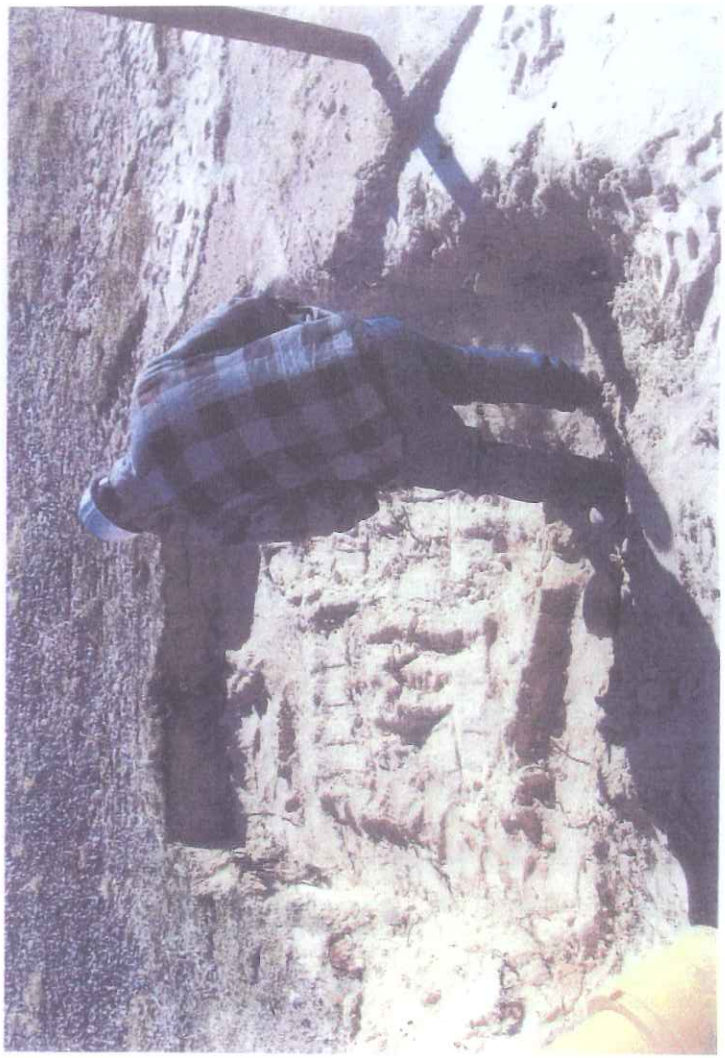
_____
NMED Inspector Date

OK - If Abandoned and meets Requirements	N/C - Not Compliant
N/I - Not Inspected	N/V - Not Verified
N/A - Not Applicable	

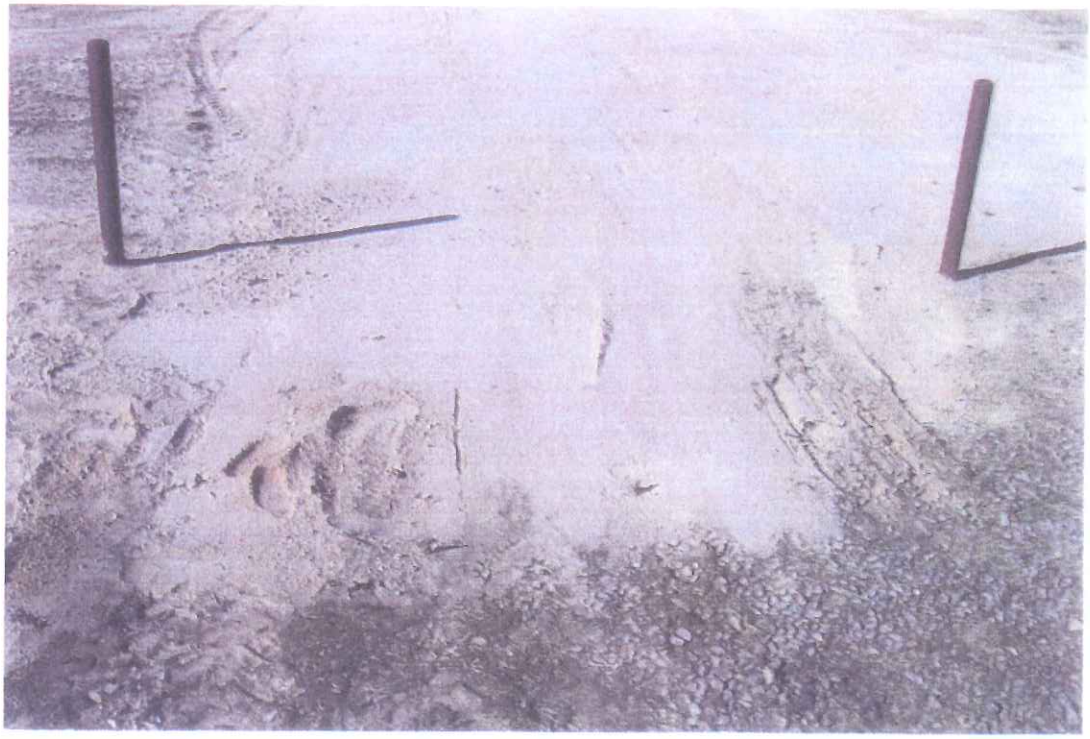
(22)A

BLDG (22)





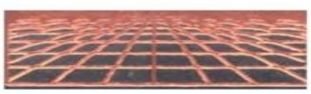
BLOC 1221



Appendix B
Geophysical Report

ULS SERVICES CORPORATION

GEOMARKOUT LOCATING Co a tradename



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---------- *A Veteran Owned Small Business* ----------

5 July 2012

Christopher Long, P.G.
Scientist
Federal Services
Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, TX 77077

Subject: Field Documentation Report for Geophysical Services -
Location of Utilities and Underground Features Associated
With Former UST and Septic System Sites,
Holloman AFB, NEW MEXICO (SHAW PO 783916-000 OP)

Gentlemen:

This report documents the recent Geophysical Survey field work ULS Services Corp completed at the subject site On and between the dates of 11 June 2012 thru 23 June 2012.

SHAW / ULS SERVICES CORP
GEOPHYSCIAL SERVICES
FORMER UST AND SEPTIC SYSTEM SITES
5 JULY 2012

SCOPE OF WORK

Scope of this work is includes geophysical services at approximately 29 Former UST or Septic Systems sites located across Holloman AFB that have reportedly undergone past abandonment in place or excavation activities. Geophysical services are employed in an attempt to locate potential USTs, former UST excavation areas, abandoned septic tanks or excavations and associated leach field areas. Location of underground utilities near these observed features is included. Observations are marked out in field and electronically mapped with GPS data collection and GIS presentation. Survey of each site is approximately 25 by 25 to 100 by 100 feet in size.

METHODS

Methods utilized in performance of this work include: Visual Inspection, Analog Real - Time Electromagnetic Induction Conductivity Detection (EMICD), Magnetic Locating (MGL), Ground Penetrating Radar (GPR), and EM Pipe and Cable Location (EMPCL). A sub-meter WAAS GPS receiver with automatic real -time differential correction and ESRI Arcpad software is utilized to collect observation data. ESRI Arc View 10 GIS software is utilized for mapping presentation.

EMIMD ground induction methods are employed to detect both 1) broad metal mass anomalies (Rectangular Surface Projections) or conductive zones that may be indicative of potential USTs – Septic tanks, conductive metal debris, steel reinforced concrete, UST's, building hosts, piping, building demo materials, drums, sumps or other unknown burial materials; and 2) to detect relative lateral changes in conductive zones of soil or backfill materials relative to native soils. Former UST excavations and septic -leachate material may potentially have a higher conductive response or well drained leachate fill materials associated with septic systems may in some cases exhibit a relatively lower or quiet conductive response relative to surrounding higher conductive soil response. A two-way Cartesian grid pattern of five by five feet is walked within the search area (site). Observations are real time and marked on ground surface with paint and pin flagging. Observations are collected with a sub- meter GPS with automatic differential correction and plotted approximately onto web based imagery.

GPR is utilized to detect and potentially observe former UST excavation sidewalls as well as septic – leach field pit sidewall and fill areas. GPR is also utilized to compliment the EM Pipe and Cable utility survey work by potentially locating conductive as well as non-conductive utilities.

A EM Pipe and Cable Survey is conducted at each site by performing ambient passive live power and communication line sweeps, active ground induction sweeps, and active direct- connect or induction- clamp sweeps using existing conducts or pipes visibly nearby. Multiple active frequencies are utilized for best Detection. Utilities are identified where possible and marked unknown if not identified.

All observations are marked with hi-visibility orange-red marking paint. Some Ares are hi-lighted with black paint due to light soil conditions. GPR boundaries indicating potential septic tank and leach field areas are outlined with black paint. Pin flags are also utilized to mark these boundaries in soft soil and weed areas.

OBSERVATIONS

Site Description

The Project Site (Holloman AFB - Former UST and Septic Systems) is comprised of approximately 29 different environmental site locations (heir in referred to as Sites) . Each sites includes and varies in description from existing active building locations to in-active remote abandoned to former building areas where USTs or Septic systems were utilized in the past. Each Site is fairly flat with sandy to gravelly surface conditions. Some sites include native brush and weeds. Sites near active building areas include asphalt or concrete surfaces, sidewalks and planter areas. ULS field staff helped review historical documentation available of each site in the field. Where available, drawings and photographs were reviewed. When available, reported GPS coordinates from reports, of septic tank locations, were utilized by SHAW field staff to navigate to septic tank location to aid focus search area.

Generally there are no surface indications of USTS or Septic tanks, however some limited features exist at some sites and include potential vent riser pipes and asphalt patching, settling areas, and conidial – rectangular cracks in concrete. Surface indications of septic systems at some sites include potential inactive clean- outs pipes near building and nearby existing upgraded sewer man-hole systems that have been connected to the existing Base sewer collection system. Some septic system sites have open holes , surface erosion, and associated potential underground voids observed near the inactive cleanouts and suspected septic search area.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

General ambient or background EM conditions at this site are categorized as being high or noisy most likely resulting from caliche or saline soil conditions throughout the area. These conditions all result in a high ambient background EMICD response that are difficult to filter out, however, subtle to distinct lateral changes are observed potentially marking position of former UST excavations. Magnetic locator is not affected by saline conditions. GPR response in these conditions is poor to somewhat fair, however, subtle, trends in GPR observations exhibit dipping or high angle (from horizontal) refraction bands indicating potential soil side-wall trends allowing for location of approximate former excavations. The use of EMICD and GPR data in conjunction with historical information and physical observations are all utilized to mark the approximate location of potential former USTs in the field as shown on the GIS imagery maps.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

Similar response is observed near former septic systems. Most all septic tanks are reported to have been abandoned in place or partly crushed in place. Magnetic locator surveys revealed concentrated areas of metal response (metal anomalies) likely from metal plates and rebar in septic tanks in areas near former sewer clean-outs and next to reported septic tank locations where latitude and longitude data is available. EM Induction and GPR transects over these metal anomalies further corroborated these findings. EM Induction survey results near the effluent (down gradient) side of metal anomalies (potential septic tanks) resulted in observation of relatively moderately higher lateral response to zones of low to quiet lateral response zones near the septic tanks relative to the ambient response in surrounding area. GPR data across these zones exhibited very subtle side-wall trends that appear to corroborate with EMICD findings. The use of EMICD and GPR data in conjunction with historical information and physical observations of cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs in the field and as shown on the GIS imagery maps.

CONCLUSIONS and LIMITATIONS

The use of EMICD and GPR data in conjunction with historical information and physical observations of reported building location, vent riser location, boiler room location, existing and abandoned sewer cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs , Septic tanks and leach fields. Ambient soil conductivity at this site is very high and EM and GPR data observed is very subtle. Field trends are used to mark the approximate location of potential targets.

As in any type of survey or investigation to determine characteristics below grade, careful exploratory excavation or drilling may be needed to further help determine a more accurate determination of the subsurface. Use of hand tools and air knifing is also useful to help as a safety measure. Base one- call utilities, as well as, private 811 one –call should be consulted and recalled as necessary.

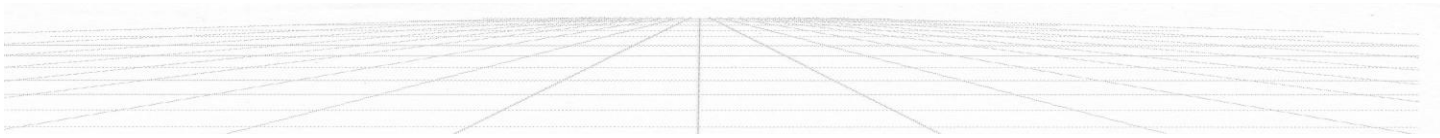
If you have any questions regarding this report please contact me at (206) 384- 2857.

Sincerely,

ULS SERVICES CORPORATION
Geomarkout tradename

Michael W. Benedict
Site Representative

Admin Office/Billing: PO Box 724 Pocatello, Idaho 83204
(208) 234-1441 Fax (208) 234-1507 1 800 301-4420
Seattle / Portland / SAC / Alaska / HWI – AS - GUAM Operations
1 - (866) 804- 5734 / San Diego – LA / Operations 1 - (800) 528-8206



BLDG 1221 POTENTIAL SEPTIC SYSTEM
HOLLOMAN AFB

GOOGLE PRO_UTM
ULS SERVICES CORP
mwb 19 June 2012

0 15 30 60 90 120
Feet

Appendix C
Sample Collection Logs

Sample Collection Log

STATION 1

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code OTC539

RFA / COC Number R4D 6/28/12 144106-H008

Sample Number OTC539-IS-0001-~~MMDDYY~~ 062912

Task

Sample Name OTC539-z-OTC539-IS-0001-MMDDYY-z

Collection Date 06/29/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0833

Sample Purpose ~~Unknown~~ Invest

Start Depth 3'

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

6/29/12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code FIELDQC

RFA / COC Number 144106 -H008

Sample Number OTC539-IS-0001-~~MMDDYY~~062912-MS

Task

Sample Name FIELDQC-z-OTC539-IS-0001-MMDDYY-MS-z

Collection Date 06/29/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0835

Sample Purpose ~~Unknown~~ QC

Start Depth 3'

End Depth 5'

QC Code LAB MATRIX SPIKE

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam R.D., CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	)(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Rachel Daly 6/29/12 *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code FIELDQC

RFA / COC Number 144106-H008

Sample Number OTC539-IS-0001-~~MMDDY~~062912Y-MSD

Task

Sample Name FIELDQC-z-OTC539-IS-0001-MMDDYY-MSD-z

Collection Date 6/29/12

Sampling Method ~~Unknown~~ DPT QC

Sample Type ~~Unknown~~ GRAB

Collection Time 0835

Sample Purpose ~~Unknown~~

Start Depth 3'

End Depth 5'

QC Code LAB MATRIX SPIKE DUPLICATE

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Rachel Daly 6/29/12

Reviewed By / Dat _____

Sample Collection Log

STATION 1

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code OTC539

RFA / COC Number 144106 -H008

Sample Number OTC539-IS-0002-~~MMDDYY~~ 062912

Task

Sample Name OTC539-z-OTC539-IS-0002-MMDDYY-z

Collection Date 6/29/12

Sampling Method ~~Unknown~~ DPT Invest.

Sample Type ~~Unknown~~ Grab

Collection Time 0845

Sample Purpose Unknown

Start Depth 10'

End Depth 12

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Rachel Daly 06/29/12 *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code OTC539

RFA / COC Number 149106-H008

Sample Number OTC539-IS-0003-~~MMDDYY~~ 062912

Task

Sample Name OTC539-z-OTC539-IS-0003-MMDDYY-z

Collection Date 06/29/12

Sampling Method ~~Unknown~~ DPT Invest.

Sample Type ~~Unknown~~ Grab

Collection Time 0855

Sample Purpose ~~Unknown~~

Start Depth 7'

End Depth 9'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06/29/12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw Environmental & Infrastructure Solutions

Manager Christopher Long

Location Code OTC539

RFA / COC Number 144106-H008

Sample Number OTC539-IS-0004-~~MMDDYY~~ 06292

Task

Sample Name OTC539-z-OTC539-IS-0004-MMDDYY-z

Collection Date 06 29 12

Sampling Method Unknown

Sample Type Unknown

Collection Time 0900

Sample Purpose Unknown

Start Depth 14'

End Depth 16'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06/29/12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

STATION 3

Shaw Solutions

- Holloman AFB

Manager Christopher Long

Location Code OTC539

RFA / COC Number 149106 - H008

Sample Number OTC539-IS-~~0005-MMDDYY~~ 062912

Task

Sample Name OTC539-z-OTC539-IS-0005-MMDDYY-z

Collection Date 062912

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0910

Sample Purpose ~~Unknown~~ Invest

Start Depth 3'

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Rachel Daly 06/29/12

Reviewed By / Dat _____

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code FIELDQC

RFA / COC Number 144106 - H008

Sample Number OTC539-IS-0006-~~MMDDYY~~062912-FD

Task

Sample Name FIELDQC-z-OTC539-IS-0006-MMDDYY-FD-z

Collection Date 06/29/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0915

Sample Purpose ~~Unknown~~ QC

Start Depth 3'

End Depth 5'

QC Code FIELD DUPLICATE

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06/29/12

Logged By / Dat Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw Environmental & Infrastructure Solutions

Manager Christopher Long

Location Code OTC539

RFA / COC Number 194106-H008

Sample Number OTC539-IS-0007-~~MMDDYY~~ 062912

Task

Sample Name OTC539-z-OTC539-IS-0007-MMDDYY-z

Collection Date 06/29/12

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0920

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 12

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Rachel Daly 06/29/12

Reviewed By / Dat _____

Sample Collection Log

- Holloman AFB

Shaw Environmental Solutions

Manager Christopher Long

Location Code OTC539

RFA / COC Number 194106-H008 ~~062912~~

Sample Number OTC539-IS-0008-~~MMDDYY~~ 062912

Task

Sample Name OTC539-z-OTC539-IS-0008-MMDDYY-z

Collection Date 062912

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0930

Sample Purpose ~~Unknown~~ invest.

Start Depth 3'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 5'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam RD, CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06/29/12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw Environmental Solutions

Manager Christopher Long

Location Code OTC539

RFA / COC Number 149106-H008

Sample Number OTC539-IS-0009-~~MMDDYY~~ 062912

Task

Sample Name OTC539-z-OTC539-IS-0009-MMDDYY-z

Collection Date 062912

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0935

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 12

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Rachel Daly 06/29/12 *Reviewed By / Dat* _____

Sample Collection Log

IDW Soil

Shaw Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code ~~FIELDQC~~ IDW

RFA / COC Number HO 38

Sample Number ~~OTC644-GW-0111-MMDDYY-FD~~ LDY-IDWD1-090412

Sample Name ~~FIELDQC-1-OTC644-GW-0111-MMDDYY-FD-z~~

Task

Collection Date 09/04/2012

Sampling Method ~~Unknown~~ Composite

Sample Type ~~Unknown~~ Soil

Collection Time 1330

Sample Purpose ~~Unknown~~ IDW characterization

Start Depth NA

QC Code ~~FIELD DUPLICATE~~ NA

End Depth NA

Sampling Equip Stainless steel Trowel/Bowl/Aluminum

Sample Matrix ~~GROUND WATER~~ IDW Soil

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam LaThom, Hodu

Containers:

	Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
1)	VOCs by SW8260C TCLP VOCs	A	Unknown	~~3~~ 1	~~40~~ 8oz	~~ML~~	~~40 ml VOA Vials~~ Glass	~~HCL~~ Cool to 4°C
	~~SW8015B : GRO~~	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
2)	SVOCs by SW8270D TCLP SVOCs / other organics	EB	Unknown	2 1	8	x oz	~~1 Liter Amber Glass~~ glass	Cool to 4°
	~~SW8015B : GRO~~	D	Unknown	0	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~SW8015B : DRO~~	D	Unknown	2	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~PCBs by SW8082A~~ ~~TCLP~~	E	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
	~~Explosives by SW8330A~~	F	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
3)	~~Tritium by 906.0 Mod~~ RCI	C	Unknown	2	1	L	~~1 Liter Amber Glass~~ Glass	~~Cool to 4°~~ Cool to 4°C
4)	Mercury by SW7470A TCLP Mercury	~~F~~ D	Unknown	0 1	~~500~~ 8oz	~~ML~~ oz	500 ml Poly Container Glass	~~HNO3~~ Cool to 4°C
5)	Metals by SW6020A TCLP Metals	~~H~~ E	Unknown	0 1	~~500~~ 8oz	~~ML~~	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
	~~Metals by SW6010C~~	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
	~~Total CN water by 335.4~~	I	Unknown	1	500	ML	~~500 ml Poly Container~~	NaOH
	~~TDS by 160.1~~	J	Unknown	1	500	ML	500 ml Poly Container	Cool to 4°

Comments: Composite Soil sample for TCLP analyses of IDW cuttings rolloff at Laydown Yard, 09/04/12

Sketch Location: Rolloff box Composite Sample @ Laydown Yard.

Analyses: TCLP VOCs, TCLP SVOCs, TCLP metals, TCLP Mercury, RCI

LDY = Laydown Yard

~~Shaw~~ *Logged By / Dat* Mel Hall *Reviewed By / Dat* _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code BULK WATER TANK

RFA / COC Number 144106 H070

Sample Number HAFB-IDW-BULK WATER-0001-111612

Task 144106.JM20000

Sample Name HAFB-IDW-BULK WATER-0001-111612

Collection Date 11/16/12

Sampling Method BAILER

Sample Type GRAB

Collection Time 13:00

Sample Purpose CONFIRM IDW

Start Depth N/A

QC Code

End Depth N/A

Sampling Equip DISPOSABLE BAILER

Sample Matrix **WATER**

QC Partners:

(TB) (EB) (FB)

SampleTeam JH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	B	Unknown	4	8	8OZ	Amber Glass	Cool to 4°
SW8015 : ORO	C	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015 : DRO	C	Unknown	1	1	L	1 Liter Amber Glass	H2SO4
Metals by SW6020A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
METALS by SW6020A	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Mercury by SW7470A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Metals by SW6010C	D	Unknown	1	500	ML	500 ml Poly Container	HNO3
	E		1	500	ML	500 ml Poly Cont	Cool to 4°
SW8015 : GRO	F	Unknown	3	40	ML	40 ml VOA Vials	HCL

Comments: SAMPLE COLLECTED FROM BULK WATER STORAGE TANK AFTER ALL WATER DRUMS WERE CONSOLIDATED. SENT BOTH A PRESERVED AND UNPRESERVED 500ML POLY FOR METALS. SPOKE WITH LAB AND THEY SAID TO SEND UNPRESERVED, BUT I THINK MAYBE THEY MADE A MISTAKE.

Sketch Location:

Shaw Logged By / Dat

Reviewed By / Dat

Appendix D
Boring Logs

Boring ID: OT-C539-Station 1

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1221

Date Completed: 6/29/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4139.38
Y Coordinate: 682511.7704
X Coordinate: 1693518.1734

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); light brown; dry; soft.	ML	Hand auger from 0 - 5 ft. Began drilling on 6/29/12.
5		OTC539-IS-0001-062912	NR		Same as above (0 ft).		
10		OTC539-IS-0002-062912	NR		Same as above (0 ft).		
15							Total depth = 13 ft. Reached total depth on 6/29/12. **Water table not encountered in this boring.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:49 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C539-Station 2

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1221

Date Completed: 6/29/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4139.12
Y Coordinate: 682518.0355
X Coordinate: 1693499.7618

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); light brown; dry; soft; trace very fine sand.	ML	Hand auger from 0 - 5 ft. Began drilling on 6/29/12.
5			NR		SILT with Sand (ML); light brown; dry; soft.		
		OTC539-IS-0003-062912					
10			NR		Same as above (5 ft).		
15		OTC539-IS-0004-062912	NR		Same as above (5 ft). SILT (ML); mottled red and white; dry; medium firm; clayey.		
20							Total depth = 18 ft. Reached total depth on 6/29/12. **Water table not encountered in this boring.
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:49 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C539-Station 3

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1221

Date Completed: 6/29/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4139.05
Y Coordinate: 682510.1318
X Coordinate: 1693494.7872

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); light brown; dry; soft; trace very fine sand. Note: trace gypsum crystals.	ML	Hand auger from 0 - 5 ft. Began drilling on 6/29/12.
5		OTC539-IS-0005-062912 and OTC539-IS-0006-062912-FD	NR		SILT with Sand (ML); light brown; dry; soft. Note: trace gypsum.		
10		OTC539-IS-0007-062912	NR		Same as above (5 ft).		Total depth = 13 ft. Reached total depth on 6/29/12. **Water table not encountered in this boring.
15							
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:49 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C539-Station 4

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1221

Date Completed: 6/29/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4138.58
Y Coordinate: 682492.2960
X Coordinate: 1693475.7957

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); light brown; dry; soft; trace very fine sand.	ML	Hand auger from 0 - 5 ft. Began drilling on 6/29/12.
5		OTC539-IS-0008-062912	NR		Poorly graded SAND (SP); brown; dry; loose; very fine to fine sand; trace silt. Note: trace gypsum.	SP	
10		OTC539-IS-0009-062912	NR		Same as above (4 ft).		
15			NR		Same as above (4 ft).		
20			NR		Lean CLAY (CL); mottled red and white; dry; medium stiff; trace silt. Note: trace gypsum crystals. Same as above (16 ft).	CL	
25			NR		Same as above (16 ft); stiff.		
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:49 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C539-Station 4

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1221

Date Completed: 6/29/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4138.58
Y Coordinate: 682492.2960
X Coordinate: 1693475.7957

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
30			NR		Lean CLAY (CL); mottled red and white; dry; medium stiff; trace silt. Note: trace gypsum crystals.	CL	
35			NR				Total depth = 35 ft. Reached total depth on 6/29/12. **Water table not encountered. Well not constructed at this location.
40							
45							
50							
55							
60							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:49 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Appendix E
Site Survey Data

Revised Rpt
09/11/2013
(re: TU/US-C513)
p. 7 of 10

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	682987.8550	1687022.9920	4098.16	BASE	682789.9107	1686534.0572
2	678390.1010	1678735.5020	4064.77	CP-52-P-19	678193.4892	1678248.9690
3	683252.1480	1680789.5360	4078.80	CP-55-JACK	683054.1271	1680302.4077
4	681667.1260	1694574.3780	4140.57	CP-56-AIR	681469.5645	1694083.2546
5	669733.4460	1682234.2110	4048.59	HAFB-07-07	669539.3431	1681746.6640
6	669695.2030	1718768.4150	4157.95	ALAMOAIR	669501.1112	1718270.2797
7	674362.7100	1713591.4300	4160.17	F248	674167.2655	1713094.7951
8	676850.6600	1718114.2590	4193.99	E-248	676654.4944	1717616.3133
50	691964.7620	1687201.2770	4140.90	MALONE	691764.2160	1686712.2905
51	662077.1700	1670356.4250	4077.10	BATE	661885.2861	1669872.3205
52	678390.1080	1678735.5040	4066.10	P 19	678193.4962	1678248.9710
53	644127.0780	1700529.8000	4039.00	MONT	643940.3964	1700036.9506
54	676850.6920	1718114.2670	4193.99	E 248	676654.5264	1717616.3213
55	683252.1970	1680789.5390	4080.20	JACK	683054.1761	1680302.4107
56	681667.0380	1694574.3640	4141.20	AIR	681469.4765	1694083.2406
82	678193.4999	1678248.9801	4064.92	P	677996.9451	1677762.5882
84	676654.5300	1717616.3305	4192.77	E	676458.4212	1717118.5291
85	683054.1798	1680302.4198	4079.02	JACK	682856.2163	1679815.4327
86	681469.4802	1694083.2497	4140.00	AIR	681271.9760	1693592.2686
100	685975.0760	1686614.9100	4101.87	OT-C534-PVC	685776.2660	1686126.0934
101	685975.4260	1686614.8310	4102.28	OT-C534-CASING	685776.6159	1686126.0145
102	685952.4860	1686626.9650	4101.89	OT-C534-W2-PVC	685753.6825	1686138.1449
103	685952.6870	1686626.9300	4102.33	OT-C534-W2-CASING	685753.8834	1686138.1099
104	685939.9110	1686581.7340	4101.89	OT-C534-W1-CASING	685741.1111	1686092.9270
105	685939.6450	1686581.7790	4101.57	OT-C534-W1-PVC	685740.8452	1686092.9720
106	685924.3640	1686619.9800	4101.81	OT-C534-W4-PVC	685725.5687	1686131.1620
107	685924.6590	1686619.8790	4102.23	OT-C534-W4-CASING	685725.8636	1686131.0610
108	685934.1180	1686578.3320	4101.72	OT-C534-LEACH-NG	685735.3198	1686089.5260
109	685935.7830	1686600.7340	4101.88	OT-C534-LEACH-NG	685736.9843	1686111.9215
110	685938.2680	1686607.0980	4101.88	OT-C534-LEACH-NG	685739.4686	1686118.2837
111	685951.4240	1686604.4600	4101.90	OT-C534-LEACH-NG	685752.6208	1686115.6465
112	685953.8200	1686601.1380	4101.88	OT-C534-LEACH-NG	685755.0161	1686112.3254
113	685953.2500	1686596.8650	4101.88	OT-C534-LEACH-NG	685754.4463	1686108.0537
114	685946.2830	1686578.3790	4101.81	OT-C534-LEACH-NG	685747.4813	1686089.5730
115	685945.3070	1686576.3400	4101.88	OT-C534-LEACH-NG	685746.5056	1686087.5346
116	685940.6850	1686575.6580	4101.79	OT-C534-LEACH-NG	685741.8849	1686086.8528
117	685952.3510	1686614.8200	4102.03	OT-C534-LEACH-NG	685753.5475	1686126.0035
118	685953.0040	1686623.0300	4102.13	OT-C534-LEACH-NG	685754.2004	1686134.2111
119	685945.6920	1686623.1960	4102.03	OT-C534-LEACH-NG	685746.8905	1686134.3770
120	685944.8810	1686615.5440	4101.97	OT-C534-LEACH-NG	685746.0797	1686126.7272
121	685948.0570	1686615.1700	4101.97	OT-C534-FLINE-NG	685749.2548	1686126.3534
122	685947.7680	1686606.3420	4101.81	OT-C534-FLINE-NG	685748.9659	1686117.5279
123	685953.2050	1686618.0690	4102.08	OT-C534-ENFLU-NG	685754.4013	1686129.2515
124	685968.5800	1686611.5870	4102.06	OT-C534-ENFLU-NG	685769.7718	1686122.7714
125	686021.5760	1686604.3860	4102.49	OT-C534-ENFLU-NG	685822.7525	1686115.5725
126	686051.0660	1686600.5520	4102.82	OT-C534-ENFLU-NG	685852.2339	1686111.7396
127	682943.9250	1686529.5770	4094.74	OT-C536-STATION1-NG	682745.9934	1686040.7852
128	682925.1900	1686534.9010	4094.63	OT-C536-STATION2-NG	682727.2639	1686046.1076
129	682914.0740	1686530.8350	4094.17	OT-C536-STATION3-NG	682716.1511	1686042.0428
130	682900.2750	1686534.1950	4094.40	MW-OT-C5361-CASING	682702.3561	1686045.4018
131	682900.0410	1686534.2560	4094.03	MW-OT-C5361-PVC	682702.1222	1686045.4628
132	682892.0960	1686514.3610	4094.08	OT-C536-LEACH-NG	682694.1795	1686025.5736
133	682905.9860	1686504.4840	4093.98	OT-C536-LEACH-NG	682708.0654	1686015.6994
134	682914.9460	1686505.2970	4094.10	OT-C536-LEACH-NG	682717.0228	1686016.5122
135	682919.4610	1686521.1490	4094.40	OT-C536-LEACH-NG	682721.5365	1686032.3596
136	682921.1340	1686534.7310	4094.42	OT-C536-LEACH-NG	682723.2091	1686045.9377
137	682919.5910	1686545.0230	4094.72	OT-C536-LEACH-NG	682721.6665	1686056.2267
138	682912.1700	1686551.2270	4094.60	OT-C536-LEACH-NG	682714.2477	1686062.4289
139	682897.7180	1686551.9240	4094.16	OT-C536-LEACH-NG	682699.7998	1686063.1257
140	682892.5110	1686549.8820	4094.18	OT-C536-LEACH-NG	682694.5943	1686061.0843
141	682922.3680	1686533.4440	4094.42	OT-C536-TANKPIT-NG	682724.4427	1686044.6510
142	682920.9800	1686525.5880	4094.39	OT-C536-TANKPIT-NG	682723.0551	1686036.7973
143	682928.0220	1686524.4280	4094.63	OT-C536-TANKPIT-NG	682730.0951	1686035.6377
144	682929.2370	1686532.7090	4094.62	OT-C536-TANKPIT-NG	682731.3097	1686043.9163
145	682949.7020	1686528.9800	4094.75	OT-C536-ENFLU-NG	682751.7688	1686040.1883
146	682921.2900	1686528.9090	4094.41	OT-C536-ENFLU-NG	682723.3650	1686040.1174
147	682916.2970	1686530.1310	4094.27	OT-C536-ENFLU-NG	682718.3735	1686041.3390
148	682877.6850	1686739.3620	4095.03	OT-C533-MW-CASING	682679.7726	1686250.5094
149	682877.4490	1686739.4350	4094.68	OT-C533-MW-PVC	682679.5367	1686250.5823
150	682884.2550	1686735.8390	4094.76	OT-C533-LEACH-NG	682686.3407	1686246.9874
151	682877.4700	1686734.1690	4094.84	OT-C533-LEACH-NG	682679.5577	1686245.3179

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
152	682871.6400	1686736.6530	4094.83	OT-C533-LEACH-NG	682673.7294	1686247.8011
153	682869.4200	1686738.9370	4094.89	OT-C533-LEACH-NG	682671.5100	1686250.0845
154	682868.8760	1686741.4810	4094.99	OT-C533-LEACH-NG	682670.9662	1686252.6277
155	682867.8710	1686756.1100	4095.03	OT-C533-LEACH-NG	682669.9615	1686267.2525
156	682857.6950	1686766.0680	4095.35	OT-C533-LEACH-NG	682659.7884	1686277.2076
157	682855.8760	1686772.9280	4095.39	OT-C533-LEACH-NG	682657.9700	1686284.0656
158	682855.6590	1686783.4130	4095.46	OT-C533-LEACH-NG	682657.7530	1686294.5476
159	682855.5230	1686790.0690	4095.47	OT-C533-LEACH-NG	682657.6171	1686301.2017
160	682857.2270	1686794.8730	4095.42	OT-C533-LEACH-NG	682659.3206	1686306.0043
161	682858.6900	1686813.7880	4095.55	OT-C533-LEACH-NG	682660.7832	1686324.9138
162	682867.9360	1686816.7350	4095.32	OT-C533-LEACH-NG	682670.0265	1686327.8599
163	682880.0660	1686814.6740	4095.00	OT-C533-LEACH-NG	682682.1530	1686325.7995
164	682891.9700	1686818.7840	4094.82	OT-C533-LEACH-NG	682694.0535	1686329.9083
165	682901.1340	1686806.7570	4094.86	OT-C533-LEACH-NG	682703.2148	1686317.8848
166	682889.7110	1686785.0140	4094.98	OT-C533-LEACH-NG	682691.7952	1686296.1481
167	682889.3190	1686757.8750	4094.96	OT-C533-LEACH-NG	682691.4033	1686269.0170
168	682886.6550	1686745.7080	4094.83	OT-C533-LEACH-NG	682688.7400	1686256.8535
169	682895.8900	1686814.7130	4095.19	OT-C533-FFLUEN-NG	682697.9724	1686325.8385
170	682901.8890	1686814.2530	4095.86	OT-C533-FFLUEN-TPAD	682703.9696	1686325.3787
171	682901.5970	1686811.8220	4095.84	OT-C533-SEPTIC-TCONC	682703.6777	1686322.9484
172	682911.5820	1686810.3750	4095.77	OT-C533-SEPTIC-TCONC	682713.6598	1686321.5018
173	682912.4280	1686815.4170	4095.77	OT-C533-SEPTIC-TCONC	682714.5056	1686326.5423
174	682902.3730	1686816.8390	4095.84	OT-C533-SEPTIC-TCONC	682704.4535	1686327.9639
175	682912.0910	1686812.7560	4095.77	OT-C533-EFLUEN-TCONC	682714.1687	1686323.8821
176	682923.3600	1686810.9450	4095.29	OT-C533-EFLUEN-NG	682725.4344	1686322.0716
177	682942.2940	1686810.3140	4095.49	OT-C533-EFLUEN-NG	682744.3629	1686321.4408
178	682937.5080	1686805.9000	4095.30	OT-C533-STATION1-NG	682739.5783	1686318.0278
179	682906.2780	1686808.8380	4094.86	OT-C533-STATION2-NG	682708.3574	1686319.9652
180	682895.2770	1686813.2080	4094.98	OT-C533-STATION3-NG	682697.3595	1686324.3340
181	700191.9570	1695605.3730	4181.72	OT-C540-STATION1-ASP	699989.0266	1695113.9508
182	700173.9260	1695611.2520	4181.82	OT-C540-STATION2-NG	699971.0008	1695119.8281
183	700168.8930	1695604.5390	4181.39	OT-C540-STATION3-NG	699965.9693	1695113.1170
184	700151.2700	1695598.6630	4180.49	OT-C540-STATION4-NG	699948.3514	1695107.2427
185	700158.9630	1695593.9090	4180.86	OT-C540-LEACH-NG	699956.0422	1695102.4901
186	700150.2560	1695603.0840	4180.78	OT-C540-LEACH-NG	699947.3377	1695111.6625
187	700152.8330	1695609.6400	4180.81	OT-C540-LEACH-NG	699949.9139	1695118.2166
188	700155.1660	1695611.7200	4180.89	OT-C540-LEACH-NG	699952.2463	1695120.2960
189	700161.1020	1695611.3470	4181.11	OT-C540-LEACH-NG	699958.1805	1695119.9231
190	700163.7200	1695601.1600	4181.06	OT-C540-LEACH-NG	699960.7978	1695109.7390
191	700161.5790	1695596.1920	4181.05	OT-C540-LEACH-NG	699958.6574	1695104.7725
192	700165.7400	1695603.7570	4181.48	OT-C540-FFLUEN-NG	699962.8172	1695112.3353
193	700170.8520	1695608.8530	4181.93	OT-C540-FFLUEN-NG	699967.9277	1695117.4298
194	700170.7290	1695606.7600	4182.01	OT-C540-SEPTIC-NG	699967.8048	1695115.3374
195	700176.8760	1695605.4490	4181.91	OT-C540-SEPTIC-NG	699973.9500	1695114.0268
196	700177.5910	1695612.4300	4181.92	OT-C540-SEPTIC-NG	699974.6648	1695121.0058
197	700172.1930	1695613.9030	4182.05	OT-C540-SEPTIC-NG	699969.2683	1695122.4783
198	700177.7030	1695608.9790	4181.69	OT-C540-EFLUEN-NG	699974.7767	1695117.5558
199	700205.8220	1695608.1850	4181.85	OT-C540-EFLUEN-ASPH	700002.8876	1695116.7620
200	700246.4300	1695613.4690	4182.95	OT-C540-EFLUEN-ASPH	700043.4838	1695122.0445
201	700238.4930	1695614.0360	4182.51	OT-C540-BLDGCOR	700035.5491	1695122.6113
202	700228.4390	1695608.1640	4182.55	OT-C540-BLDGCOR	700025.4980	1695116.7410
203	700227.0510	1695568.0300	4182.87	OT-C540-BLDGCOR	700024.1104	1695076.6186
204	700236.9380	1695557.6950	4183.02	OT-C540-BLDGCOR	700033.9946	1695066.2866
205	688305.7410	1690609.5510	4126.46	TU\US-C507-STATION1-	688106.2555	1690119.5767
206	688309.7220	1690614.0760	4126.51	TU\US-C507-STATION2-	688110.2353	1690124.1004
207	688306.7130	1690619.4150	4126.45	TU\US-C507-STATION3-	688107.2272	1690129.4378
208	688313.7000	1690621.8280	4126.37	TU\US-C507-STATION4-	688114.2122	1690131.8501
209	688313.7950	1690607.6410	4126.36	TU\US-C507-STATION5-	688114.3071	1690117.6673
210	688304.0140	1690620.9730	4126.47	TU\US-C507-USTPIT-AS	688104.5290	1690130.9954
211	688304.3040	1690607.3010	4126.54	TU\US-C507-USTPIT-AS	688104.8189	1690117.3274
212	688317.4320	1690607.1780	4126.54	TU\US-C507-USTPIT-AS	688117.9431	1690117.2044
213	688317.6000	1690622.2860	4126.57	TU\US-C507-USTPIT-AS	688118.1110	1690132.3080
214	688320.7590	1690623.9670	4127.18	TU\US-C507-BLDGCOR	688121.2691	1690133.9885
215	688330.7630	1690627.7570	4125.65	TU\US-C507-BLDGCOR	688131.2702	1690137.7774
216	688318.5520	1690598.7120	4126.71	TU\US-C507-BLDGCOR	688119.0628	1690108.7408
217	688306.5580	1690598.9520	4126.69	TU\US-C507-BLDGCOR	688107.0722	1690108.9808
218	688287.5740	1690592.3200	4126.83	TU\US-C507-EXMW1	688088.0937	1690102.3507
219	688287.4600	1690625.9270	4126.36	TU\US-C507-EXMW2	688087.9798	1690135.9480
220	689216.8690	1680453.8850	4087.76	TU\US-C501-STATION4-	689017.1194	1679966.8540
221	689203.4000	1680450.4300	4087.80	TU\US-C501-STATION1-	689003.6543	1679963.4000
222	689227.9170	1680449.2880	4087.78	TU\US-C501-STATION2-	689028.1642	1679962.2584

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
223	689201.2820	1680437.6020	4087.96	TU\US-C501-STATION3-	689001.5369	1679950.5757
224	689204.0090	1680426.7550	4087.80	TU\US-C501-STATION5-	689004.2631	1679939.7319
225	689200.5240	1680440.6650	4087.95	TU\US-C501-BLDGCOR-N	689000.7792	1679953.6379
226	689191.1430	1680432.8740	4088.07	TU\US-C501-BLDGCOR-N	688991.4009	1679945.8491
227	689202.0960	1680449.8730	4087.79	TU\US-C501-TANKPIT-N	689002.3507	1679962.8432
228	689201.5860	1680440.8210	4087.99	TU\US-C501-TANKPIT-N	689001.8408	1679953.7938
229	689191.7450	1680432.9310	4088.07	TU\US-C501-TANKPIT-N	688992.0027	1679945.9061
230	689195.4710	1680423.1750	4087.88	TU\US-C501-TANKPIT-N	688995.7276	1679936.1529
231	689207.1960	1680422.4490	4087.92	TU\US-C501-TANKPIT-N	689007.4492	1679935.4271
232	689229.2900	1680431.3210	4087.77	TU\US-C501-TANKPIT-N	689029.5368	1679944.2966
233	689231.6150	1680444.1310	4087.67	TU\US-C501-TANKPIT-N	689031.8611	1679957.1029
234	689227.5450	1680454.7320	4087.83	TU\US-C501-TANKPIT-N	689027.7923	1679967.7008
235	689218.0540	1680463.3780	4088.03	TU\US-C501-TANKPIT-N	689018.3041	1679976.3443
236	689209.0460	1680458.6260	4087.92	TU\US-C501-TANKPIT-N	689009.2987	1679971.5937
237	689237.1630	1680445.1670	4087.64	TU\US-C501-COMMLINE-	689037.4075	1679958.1386
238	689219.6050	1680436.9770	4088.00	TU\US-C501-COMMLINE-	689019.8546	1679949.9509
239	689199.7540	1680431.6770	4088.06	TU\US-C501-COMMLINE-	689000.0094	1679944.6525
240	689181.3550	1680425.0490	4088.20	TU\US-C501-COMMLINE-	688981.6157	1679938.0264
241	689162.6180	1680417.3900	4088.35	TU\US-C501-COMMLINE-	688962.8841	1679930.3696
242	689161.5970	1680417.5650	4088.56	TU\US-C501-COMMVAULT	688961.8634	1679930.5446
243	689157.8580	1680421.3400	4088.11	TU\US-C501-COMMVAULT	688958.1255	1679934.3185
244	689150.8680	1680414.5760	4088.10	TU\US-C501-COMMVAULT	688951.1375	1679927.5564
245	689154.6050	1680410.8830	4088.46	TU\US-C501-COMMVAULT	688954.8735	1679923.8645
246	687246.6430	1686873.0010	4105.82	OT-C535-STATION1-NG	687047.4644	1686384.1096
247	687270.5400	1686861.6690	4105.63	OT-C535-STATION2-NG	687071.3545	1686372.7809
248	687282.8340	1686866.7860	4105.85	OT-C535-STATION3-NG	687083.6449	1686377.8964
249	687303.5940	1686788.5490	4105.12	OT-C535-STATION4-NG	687104.3989	1686299.6821
250	687291.9640	1686793.7970	4105.27	OT-C535-LEACH-NG	687092.7723	1686304.9286
251	687304.7930	1686782.8770	4105.17	OT-C535-LEACH-NG	687105.5976	1686294.0117
252	687323.6740	1686798.1880	4105.34	OT-C535-LEACH-NG	687124.4731	1686309.3183
253	687319.7080	1686817.5380	4105.82	OT-C535-LEACH-NG	687120.5083	1686328.6627
254	687307.4400	1686838.9610	4105.76	OT-C535-LEACH-NG	687108.2438	1686350.0795
255	687297.0830	1686856.5380	4106.04	OT-C535-LEACH-NG	687097.8898	1686367.6514
256	687290.0540	1686837.9200	4105.59	OT-C535-LEACH-NG	687090.8628	1686349.0388
257	687291.3760	1686806.0200	4105.33	OT-C535-LEACH-NG	687092.1845	1686317.1480
258	687284.5890	1686864.5150	4106.11	OT-C535-FFLUEN-NG	687085.3994	1686375.6261
259	687276.8290	1686868.4490	4106.19	OT-C535-FFLUEN-NG	687077.6417	1686379.5589
260	687276.0820	1686870.8490	4106.28	OT-C535-SEPTIC-NG	687076.8949	1686381.9583
261	687263.3720	1686869.7190	4105.87	OT-C535-SEPTIC-NG	687064.1886	1686380.8286
262	687263.7200	1686863.5770	4105.95	OT-C535-SEPTIC-NG	687064.5365	1686374.6884
263	687276.4840	1686862.8870	4106.07	OT-C535-SEPTIC-NG	687077.2968	1686373.9986
264	687263.5270	1686868.1150	4105.92	OT-C535-EFLUEN-NG	687064.3435	1686379.2250
265	687228.9570	1686874.1570	4105.71	OT-C535-EFLUEN-NG	687029.7836	1686385.2653
266	687235.2230	1686881.4610	4106.05	OT-C535-BLDGCOR-NG	687036.0477	1686392.5672
267	687225.9150	1686892.3360	4105.90	OT-C535-BLDGCOR-NG	687026.7424	1686403.4390
268	687232.0250	1686844.5370	4105.92	OT-C535-BLDGCOR-NG	687032.8507	1686355.6539
269	687221.4890	1686835.3400	4105.63	OT-C535-BLDGCOR-NG	687022.3177	1686346.4595
270	677637.2460	1692755.6660	4110.24	TU/US-C505-MW1-CASIN	677440.8524	1692265.0697
271	677636.9990	1692755.6590	4109.84	TU/US-C505-MW1-PVC	677440.6055	1692265.0627
272	677634.4160	1692722.3930	4110.42	TU/US-C505-WELLATEMP	677438.0233	1692231.8064
273	677659.4620	1692742.2400	4110.34	TU/US-C505-WELLATEMP	677463.0620	1692251.6476
274	677701.9500	1692799.3200	4110.17	TU/US-C505-USTPIT-NG	677505.5377	1692308.7111
275	677701.3830	1692789.3010	4110.35	TU/US-C505-USTPIT-NG	677504.9708	1692298.6950
276	677711.5570	1692789.5280	4110.64	TU/US-C505-USTPIT-NG	677515.1419	1692298.9219
277	677710.8940	1692799.1130	4110.24	TU/US-C505-USTPIT-NG	677514.4791	1692308.5041
278	677707.4060	1692790.0820	4110.35	TU/US-C505-STATION1-	677510.9921	1692299.4757
279	677702.3100	1692795.0710	4110.20	TU/US-C505-STATION2-	677505.8976	1692304.4633
280	677705.6610	1692797.9500	4110.13	TU/US-C505-STATION3-	677509.2476	1692307.3415
281	677710.4770	1692793.8740	4110.09	TU/US-C505-STATION4-	677514.0622	1692303.2666
282	677706.4200	1692793.8350	4110.12	TU/US-C505-STATION5-	677510.0064	1692303.2276
283	677694.5060	1692779.7220	4110.88	TU/US-C505-BLDGCOR-N	677498.0958	1692289.1187
284	677704.1940	1692790.4680	4110.28	TU/US-C505-BLDGCOR-N	677507.7810	1692299.8616
285	677754.5670	1692783.0890	4110.79	TU/US-C505-BLDGCOR-N	677558.1394	1692292.4848
286	677743.8570	1692795.1680	4110.70	TU/US-C505-BLDGCOR-N	677547.4325	1692304.5603
287	686300.2320	1672933.0350	4060.98	OT-C542-MW-CASING-	686101.3277	1672448.1837
288	686300.2350	1672933.0550	4060.98	OT-C542-MW-PVC	686101.3307	1672448.2037
289	686274.4020	1672914.6520	4061.01	OT-C542-LEACH-NG	686075.5052	1672429.8061
290	686289.6710	1672938.5250	4060.76	OT-C542-LEACH-NG	686090.7698	1672453.6721
291	686294.6900	1672941.1720	4060.83	OT-C542-LEACH-NG	686095.7873	1672456.3184
292	686301.6970	1672938.9490	4060.85	OT-C542-LEACH-NG	686102.7923	1672454.0960
293	686305.7170	1672936.2850	4060.87	OT-C542-LEACH-NG	686106.8111	1672451.4328

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
294	686308.0670	1672931.0550	4060.89	OT-C542-LEACH-NG	686109.1604	1672446.2043
295	686304.8000	1672917.9090	4060.82	OT-C542-LEACH-NG	686105.8944	1672433.0621
296	686292.3740	1672901.2590	4060.90	OT-C542-LEACH-NG	686093.4720	1672416.4169
297	686283.4190	1672906.7050	4060.97	OT-C542-FFLUEN-NG	686084.5196	1672421.8614
298	686280.3770	1672902.6520	4060.94	OT-C542-FFLUEN-NG	686081.4785	1672417.8095
299	686276.9070	1672904.6420	4060.95	OT-C542-SEPTIC-NG	686078.0095	1672419.7990
300	686271.2980	1672896.9550	4060.80	OT-C542-SEPTIC-NG	686072.4021	1672412.1142
301	686281.9530	1672889.9350	4060.83	OT-C542-SEPTIC-NG	686083.0540	1672405.0962
302	686287.0950	1672896.6800	4060.88	OT-C542-SEPTIC-NG	686088.1945	1672411.8393
303	686285.7900	1672894.7150	4060.83	OT-C542-EFLUEN-NG	686086.8899	1672409.8748
304	686299.2270	1672887.1560	4060.87	OT-C542-EFLUEN-NG	686100.3230	1672402.3180
305	686310.9860	1672881.5880	4061.18	OT-C542-EFLUEN-NG	686112.0786	1672396.7516
306	686294.2970	1672858.0380	4060.90	OT-C542-BLDGCOR-NG	686095.3944	1672373.2085
307	686295.8820	1672844.1310	4061.28	OT-C542-BLDGCOR-NG	686096.9790	1672359.3055
308	686345.1390	1672922.4560	4060.89	OT-C542-BLDGCOR-NG	686146.2217	1672437.6078
309	686358.9780	1672924.0940	4061.42	OT-C542-BLDGCOR-NG	686160.0567	1672439.2453
310	686291.8860	1672885.1500	4060.65	OT-C542-STATION1-NG	686092.9841	1672400.3126
311	686275.2730	1672891.5340	4060.63	OT-C542-STATION2-NG	686076.3760	1672406.6948
312	686281.5390	1672904.6340	4060.73	OT-C542-STATION2-NG	686082.6401	1672419.7910
313	685750.1690	1671530.2910	4055.60	OT-C543-STATION2-NG	685551.4241	1671045.8463
314	685734.0730	1671548.8090	4055.84	OT-C543-STATION2	685535.3328	1671064.3589
315	685727.7350	1671514.3350	4055.33	OT-C543-STATION3	685528.9966	1671029.8949
316	685749.4390	1671546.6740	4055.91	OT-C543-EXSEPTIC	685550.6944	1671062.2245
317	685732.6430	1671545.5190	4055.74	OT-C543-EXSEPTIC	685533.9032	1671061.0699
318	685741.2600	1671557.0720	4056.32	OT-C543-EXSEPTIC	685542.5177	1671072.6195
319	685738.1510	1671537.7290	4055.62	OT-C543-EXSEPTIC	685539.4096	1671053.2821
320	685734.3520	1671541.2760	4055.65	OT-C543-FFLUEN	685535.6117	1671056.8281
321	685716.0920	1671515.5090	4055.04	OT-C543-FFLUEN	685517.3570	1671031.0686
322	685708.2650	1671520.5800	4055.23	OT-C543-LEACH	685509.5323	1671036.1381
323	685688.3040	1671512.0560	4055.52	OT-C543-LEACH	685489.5771	1671027.6166
324	685669.5610	1671502.3840	4055.36	OT-C543-LEACH	685470.8395	1671017.9474
325	685659.9210	1671495.2130	4055.04	OT-C543-LEACH	685461.2023	1671010.7784
326	685670.4020	1671495.5660	4055.43	OT-C543-MW-CASING	685471.6803	1671011.1313
327	685670.1370	1671495.6580	4055.13	OT-C543-MW-PVC	685471.4153	1671011.2233
328	685682.2550	1671485.7460	4055.16	OT-C543-LEACH	685483.5298	1671001.3142
329	685699.8070	1671491.2750	4054.76	OT-C543-LEACH	685501.0767	1671006.8416
330	685710.4840	1671499.0550	4055.06	OT-C543-LEACH	685511.7506	1671014.6193
331	685721.5030	1671508.4730	4055.40	OT-C543-LEACH	685522.7664	1671024.0346
332	685794.8190	1671498.3320	4056.84	OT-C543-EFLUEN	685596.0612	1671013.8965
333	685809.3600	1671495.0820	4059.27	OT-C543-BLDGCOR	685610.5980	1671010.6475
334	685776.9050	1671465.9090	4060.02	OT-C543-BLDGCOR	685578.1524	1670981.4829
335	685785.4230	1671455.8900	4060.26	OT-C543-BLDGCOR	685586.6679	1670971.4668
336	685744.8400	1671542.1950	4055.76	OT-C543-EFLUEN	685546.0967	1671057.7468
337	685303.6520	1671072.3550	4048.79	OT-C544-MW-CASING	685105.0365	1670588.0430
338	685303.3550	1671072.2840	4048.52	OT-C544-MW-PVC	685104.7396	1670587.9720
339	685349.4970	1671083.9730	4052.43	OT-C544-STATION1	685150.8683	1670599.6576
340	685342.4960	1671086.5980	4051.55	OT-C544-STATION1	685143.8693	1670602.2819
341	685336.0530	1671085.0120	4050.99	OT-C544-STATION1	685137.4282	1670600.6963
342	685336.7000	1671089.5480	4051.15	OT-C544-SEPTIC	685138.0750	1670605.2310
343	685338.4520	1671075.7050	4051.30	OT-C544-SEPTIC	685139.8265	1670591.3920
344	685347.8050	1671077.3720	4052.23	OT-C544-SEPTIC	685149.1768	1670593.0585
345	685345.6600	1671089.9410	4052.38	OT-C544-SEPTIC	685147.0324	1670605.6239
346	685356.1020	1671079.9660	4041.22	OT-C544-EFLUEN	685157.4713	1670595.6518
347	685347.2700	1671081.8770	4052.36	OT-C544-EFLUEN	685148.6419	1670597.5622
348	685337.4940	1671082.4320	4051.31	OT-C544-FFLUEN	685138.8687	1670598.1171
349	685335.1290	1671082.2690	4051.14	OT-C544-FFLUEN	685136.5044	1670597.9541
350	685336.2280	1671075.8560	4050.85	OT-C544-LEACH	685137.6031	1670591.5430
351	685323.3310	1671071.0830	4049.91	OT-C544-LEACH	685124.7098	1670586.7714
352	685297.8990	1671068.1360	4048.16	OT-C544-LEACH	685099.2852	1670583.8252
353	685296.9990	1671078.2660	4047.94	OT-C544-LEACH	685098.3855	1670593.9523
354	685317.0900	1671090.9580	4049.62	OT-C544-LEACH	685118.4707	1670606.6406
355	685334.6940	1671090.0750	4050.81	OT-C544-LEACH	685136.0696	1670605.7579
356	685360.4020	1671127.4140	4053.89	OT-C544-BLDGCOR	685161.7701	1670643.0860
357	685349.8450	1671114.5020	4052.32	OT-C544-BLDGCOR	685151.2162	1670630.1778
358	685360.3480	1671033.1240	4052.96	OT-C544-BLDGCOR	685161.7161	1670548.8234
359	685371.1230	1671022.2010	4053.70	OT-C544-BLDGCOR	685172.4880	1670537.9035
360	669828.5970	1693339.1960	4077.44	TU/US-C503-STATION1	669634.4665	1692848.4306
361	669823.8520	1693340.4930	4077.30	TU/US-C503-STATION2	669629.7229	1692849.7272
362	669816.1660	1693331.0930	4077.32	TU/US-C503-STATION3	669622.0391	1692840.3299
363	669804.9830	1693324.1990	4077.14	TU/US-C503-STATION5	669610.8594	1692833.4379
364	669830.2120	1693344.6950	4077.63	TU/US-C503-STATION4	669636.0811	1692853.9280

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
365	669820.3680	1693343.5050	4078.10	TU/US-C503-USTTANK	669626.2399	1692852.7383
366	669826.9160	1693337.2450	4077.78	TU/US-C503-USTTANK	669632.7860	1692846.4802
367	669831.7020	1693342.9300	4077.73	TU/US-C503-USTTANK	669637.5706	1692852.1635
368	669817.5060	1693300.2710	4077.28	TU/US-C503-BLDGCOR	669623.3788	1692809.5169
369	669817.0280	1693314.4610	4077.69	TU/US-C503-BLDGCOR	669622.9009	1692823.7028
370	669870.4630	1693326.6030	4077.24	TU/US-C503-BLDGCOR	669676.3204	1692835.8412
371	669857.6770	1693326.9550	4077.12	TU/US-C503-BLDGCOR	669663.5381	1692836.1931
372	669799.9830	1693280.8270	4076.53	TU/US-C503-BLDGCOR	669605.8608	1692790.0785
373	669786.0040	1693280.0690	4077.00	TU/US-C503-BLDGCOR	669591.8859	1692789.3207
374	669753.1970	1693299.5360	4076.55	TU/US-C503-MW1-CASIN	669559.0884	1692808.7821
375	669753.0160	1693299.6510	4076.22	TU/US-C503-MW1-PVC	669558.9075	1692808.8971
376	669717.9520	1693348.6000	4074.92	TU/US-C503-MW3-PVC	669523.8536	1692857.8319
377	669718.0930	1693348.2730	4075.65	TU/US-C503-MW3-CASIN	669523.9946	1692857.5050
378	669746.8950	1693329.2100	4076.92	TU/US-C503-BLDGCOR	669552.7882	1692838.4475
379	669747.5820	1693308.1150	4076.21	TU/US-C503-BLDGCOR	669553.4750	1692817.3586
380	669906.5180	1693361.1640	4077.43	TU/US-C503-MW2-CASIN	669712.3650	1692870.3922
381	669906.2520	1693361.2650	4077.07	TU/US-C503-MW2-PVC	669712.0990	1692870.4932
382	669887.0390	1693344.8910	4077.53	TU/US-C503-BLDGCOR	669692.8916	1692854.1239
383	669886.0230	1693359.0930	4077.99	TU/US-C503-BLDGCOR	669691.8759	1692868.3218
384	670862.3470	1691695.2520	4072.78	TU/US-C500-MW1-CASIN	670667.9169	1691204.9630
385	670862.1340	1691695.4850	4072.39	TU/US-C500-MW1-PVC	670667.7040	1691205.1960
386	670897.1420	1691671.0590	4072.25	TU/US-C500-MW2-PVC	670702.7019	1691180.7771
387	670897.3420	1691670.8340	4072.66	TU/US-C500-MW2-CASIN	670702.9018	1691180.5521
388	670997.2710	1691721.0890	4072.90	TU/US-C500-MW3-CASIN	670802.8018	1691230.7926
389	670996.9840	1691721.2540	4072.41	TU/US-C500-MW3-PVC	670802.5149	1691230.9575
390	670952.1640	1691699.4910	4072.04	TU/US-C500-STATION1	670757.7079	1691209.2008
391	670948.0960	1691682.1740	4072.36	TU/US-C500-STATION4	670753.6411	1691191.8888
392	670936.4590	1691683.8290	4072.05	TU/US-C500-STATION5	670742.0075	1691193.5434
393	670929.6330	1691690.0950	4072.11	TU/US-C500-STATION2	670735.1834	1691199.8075
394	670923.0530	1691673.0510	4072.18	TU/US-C500-STATION3	670728.6054	1691182.7685
395	670946.5050	1691708.7370	4072.40	TU/US-C500-USTPIT	670752.0506	1691218.4441
396	670961.7540	1691693.8260	4072.62	TU/US-C500-USTPIT	670767.2951	1691203.5375
397	670931.1680	1691662.3970	4072.93	TU/US-C500-USTPIT	670736.7180	1691172.1176
398	670915.4940	1691676.4560	4072.43	TU/US-C500-USTPIT	670721.0485	1691186.1725
399	670921.7940	1691667.6910	4072.61	TU/US-C500-BLDGCOR	670727.3467	1691177.4100
400	670938.3020	1691685.3670	4072.19	TU/US-C500-BLDGCOR	670743.8499	1691195.0809
401	670954.8550	1691686.5260	4072.52	TU/US-C500-BLDGCOR	670760.3981	1691196.2396
402	670964.2580	1691691.8600	4072.50	TU/US-C500-BLDGCOR	670769.7984	1691201.5720
403	670981.1410	1691692.8760	4072.84	TU/US-C500-BLDGCOR	670786.6765	1691202.5877
404	681138.2190	1690535.4430	4109.80	OT-C538-MW1-CASING	680940.8108	1690045.4902
405	681137.9660	1690535.5040	4109.43	OT-C538-MW1-PVC	680940.5579	1690045.5512
406	681154.3000	1690506.8540	4109.64	OT-C538-STATION3	680956.8871	1690016.9095
407	681170.7650	1690504.3700	4110.30	OT-C538-STATION2	680973.3473	1690014.4262
408	681207.7160	1690542.9160	4110.07	OT-C538-STATION1	681010.2876	1690052.9610
409	681171.2020	1690513.1430	4110.35	OT-C538-SEPTIC	680973.7842	1690023.1966
410	681160.8350	1690514.8700	4110.22	OT-C538-SEPTIC	680963.4202	1690024.9231
411	681157.5830	1690502.2430	4109.87	OT-C538-SEPTIC	680960.1692	1690012.2998
412	681168.6240	1690500.8410	4110.30	OT-C538-SEPTIC	680971.2070	1690010.8982
413	681157.7430	1690507.8780	4109.92	OT-C538-FFLUEN	680960.3291	1690017.9332
414	681149.7900	1690513.8560	4109.82	OT-C538-FFLUEN	680952.3784	1690023.9094
415	681146.2870	1690511.1610	4109.76	OT-C538-LEACH	680948.8764	1690021.2152
416	681140.0690	1690516.2140	4109.76	OT-C538-LEACH	680942.6602	1690026.2667
417	681131.8360	1690535.6580	4109.59	OT-C538-LEACH	680934.4296	1690045.7051
418	681142.3480	1690541.6090	4109.45	OT-C538-LEACH	680944.9386	1690051.6544
419	681148.4850	1690524.6340	4109.80	OT-C538-LEACH	680951.0738	1690034.6843
420	681152.9240	1690518.6140	4110.01	OT-C538-LEACH	680955.5115	1690028.6661
421	681171.0630	1690513.0040	4110.32	OT-C538-EFLUEN	680973.6453	1690023.0577
422	681199.3120	1690534.6340	4109.92	OT-C538-EFLUEN	681001.8861	1690044.6814
423	681311.9210	1690619.8910	4111.94	OT-C538-EFLUEN	681114.4624	1690129.9137
424	681378.0600	1690614.8720	4112.52	OT-C538-EFLUEN	681180.5823	1690124.8962
425	681511.9950	1690621.0250	4112.35	OT-C538-EFLUEN-C/O	681314.4785	1690131.0474
426	681543.8210	1690614.3290	4112.13	OT-C538-EFLUEN-C/O	681346.2952	1690124.3533
427	681545.1500	1690624.0320	4110.59	OT-C538-EFLUEN	681347.6238	1690134.0535
428	681526.9290	1690617.7410	4112.19	OT-C538-BLDGCOR	681329.4081	1690127.7643
429	681516.5600	1690627.6780	4112.22	OT-C538-BLDGCOR	681319.0421	1690137.6984
430	681517.0030	1690674.6590	4112.55	OT-C538-BLDGCOR	681319.4850	1690184.6658
431	681526.9640	1690685.0850	4112.68	OT-C538-BLDGCOR	681329.4431	1690195.0888
432	681610.3380	1690617.1910	4112.15	OT-C538-BLDGCOR	681412.7929	1690127.2145
433	681620.0290	1690626.9090	4112.29	OT-C538-BLDGCOR	681422.4811	1690136.9297
434	681248.7970	1690511.7190	4110.11	OT-C537-STATION1	681051.3567	1690021.7731
435	681230.2540	1690505.9940	4109.96	OT-C537-STATION2	681032.8191	1690016.0497

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
436	681220.0430	1690509.7920	4110.12	OT-C537-STATION3	681022.6111	1690019.8466
437	681224.9030	1690501.6020	4109.95	OT-C537-SEPTICDRY	681027.4697	1690011.6590
438	681224.2220	1690518.0560	4110.28	OT-C537-SEPTICDRY	681026.7889	1690028.1082
439	681236.7540	1690518.9910	4110.31	OT-C537-SEPTICDRY	681039.3172	1690029.0429
440	681236.4080	1690501.8520	4110.13	OT-C537-SEPTICDRY	681038.9713	1690011.9089
441	681237.2180	1690508.8330	4110.12	OT-C537-INLINE	681039.7811	1690018.8879
442	681311.7430	1690515.4440	4111.03	OT-C537-INLINE	681114.2845	1690025.4970
443	670561.7210	1680587.5740	4050.10	TU/US-C506-MW2-CASIN	670367.3781	1680100.5043
444	670561.4170	1680587.6760	4049.68	TU/US-C506-MW2-PVC	670367.0742	1680100.6062
445	670504.3430	1680580.0920	4050.14	TU/US-C506-MW1-PVC	670310.0167	1680093.0244
446	670504.5340	1680580.0020	4050.56	TU/US-C506-MW1-CASIN	670310.2076	1680092.9345
447	670508.2600	1680580.6030	4050.26	TU/US-C506-USTTANK	670313.9326	1680093.5353
448	670507.1490	1680575.9500	4050.27	TU/US-C506-USTTANK	670312.8219	1680088.8836
449	670517.9280	1680578.9030	4050.27	TU/US-C506-USTTANK	670323.5978	1680091.8358
450	670517.4300	1680574.2280	4050.28	TU/US-C506-USTTANK	670323.0999	1680087.1621
451	670507.9350	1680578.1630	4050.18	TU/US-C506-STATION1	670313.6077	1680091.0960
452	670513.3690	1680579.8330	4050.20	TU/US-C506-STATION2	670319.0401	1680092.7655
453	670517.9640	1680576.4150	4050.25	TU/US-C506-STATION3	670323.6338	1680089.3485
454	670511.2330	1680575.3810	4050.12	TU/US-C506-STATION4	670316.9047	1680088.3148
455	670512.5770	1680577.6370	4050.16	TU/US-C506-STATION5	670318.2483	1680090.5702
456	670485.1820	1680557.6150	4050.53	TU/US-C506-EXMW1-CAS	670290.8613	1680070.5540
457	670484.8980	1680557.6790	4050.38	TU/US-C506-EXMW1-PVC	670290.5773	1680070.6179
458	670494.8180	1680553.5430	4050.36	TU/US-C506-BLDGCOR	670300.4945	1680066.4831
459	670506.7310	1680561.7710	4050.38	TU/US-C506-BLDGCOR	670312.4040	1680074.7088
460	670510.1770	1680607.5970	4050.36	TU/US-C506-BLDGCOR	670315.8490	1680120.5215
461	670507.2460	1680618.1900	4050.39	TU/US-C506-BLDGCOR	670312.9189	1680131.1114
462	672564.5350	1692766.5990	4084.67	OT-C530-STATION1	672369.6116	1692275.9995
463	672567.1650	1692774.7240	4084.79	OT-C530-STATION2	672372.2409	1692284.1222
464	672567.5210	1692771.2850	4084.93	OT-C530-ACTSEPTIC	672372.5967	1692280.6842
465	672572.0780	1692767.3740	4084.89	OT-C530-ACTSEPTIC	672377.1524	1692276.7743
466	672575.8660	1692771.9070	4084.91	OT-C530-ACTSEPTIC	672380.9393	1692281.3060
467	672571.4280	1692775.8290	4084.95	OT-C530-ACTSEPTIC	672376.5026	1692285.2269
468	672569.6900	1692769.3550	4084.91	OT-C530-INLINE	672374.7651	1692278.7547
469	672563.6000	1692772.1360	4084.83	OT-C530-MW-CASING	672368.6769	1692281.5349
470	672563.2920	1692772.2960	4084.49	OT-C530-MW-PVC	672368.3690	1692281.6949
471	672509.9810	1692700.4750	4085.41	OT-C530-INLINE	672315.0734	1692209.8947
472	672538.3940	1692677.7240	4085.37	OT-C530-BLDGCOR	672343.4782	1692187.1503
473	672538.9710	1692663.8680	4085.27	OT-C530-BLDGCOR	672344.0550	1692173.2983
474	672478.3960	1692731.8290	4085.45	OT-C530-BLDGCOR	672283.4976	1692241.2396
475	672485.2490	1692739.1720	4085.12	OT-C530-BLDGCOR	672290.3486	1692248.5805
476	685978.3640	1686617.0530	4101.95	OT-C534-STATION1	685779.5530	1686128.2358
477	685949.9370	1686623.2970	4101.80	OT-C534-STATION2	685751.1342	1686134.4780
478	686041.6810	1686591.0650	4102.58	OT-C534-BLDGCOR	685842.8517	1686102.2553
479	686050.4200	1686580.6970	4102.78	OT-C534-BLDGCOR	685851.5881	1686091.8903
480	686053.7100	1686616.8100	4102.90	OT-C534-BLDGCOR	685854.8772	1686127.9929
481	686043.1140	1686607.6280	4102.82	OT-C534-BLDGCOR	685844.2842	1686118.8135
482	670482.5190	1680558.2400	4050.60	TU/US-C506-MW3-CASIN	670288.1990	1680071.1788
483	670482.3210	1680558.1750	4050.11	TU/US-C506-MW3-PVC	670288.0011	1680071.1138
484	669451.6250	1685381.2210	4054.88	TU/US-C515-STATION1	669257.6038	1684892.7620
485	669456.5920	1685373.9060	4054.66	TU/US-C515-STATION2	669262.5694	1684885.4491
486	669447.7270	1685364.3830	4054.13	TU/US-C515-STATION3	669253.7069	1684875.9289
487	669442.7430	1685375.3260	4054.34	TU/US-C515-STATION4	669248.7244	1684886.8687
488	669450.0780	1685373.9310	4054.62	TU/US-C515-STATION5	669256.0572	1684885.4741
489	669529.8630	1685390.3120	4053.57	TU/US-C515-MW3-PVC	669335.8191	1684901.8503
490	669530.0710	1685390.1630	4053.84	TU/US-C515-MW3-CASIN	669336.0271	1684901.7014
491	669347.3380	1685357.3580	4053.37	TU/US-C515-MW2-CASIN	669153.3470	1684868.9059
492	669347.0390	1685357.4240	4052.93	TU/US-C515-MW2-PVC	669153.0481	1684868.9719
493	669367.7310	1685396.1250	4053.43	TU/US-C515-MW1-PVC	669173.7341	1684907.6617
494	669368.0180	1685396.0880	4053.86	TU/US-C515-MW1-CASIN	669174.0210	1684907.6247
495	669413.7390	1685386.4140	4054.97	TU/US-C515-BLDGCOR	669219.7288	1684897.9535
496	669405.0760	1685397.5400	4056.39	TU/US-C515-BLDGCOR	669211.0683	1684909.0762
497	669442.6490	1685383.8010	4054.90	TU/US-C515-TANKPIT	669248.6304	1684895.3412
498	669458.4310	1685381.6630	4055.08	TU/US-C515-TANKPIT	669264.4078	1684893.2039
499	669454.7400	1685363.6010	4054.47	TU/US-C515-TANKPIT	669260.7179	1684875.1471
500	669440.8050	1685364.3540	4054.07	TU/US-C515-TANKPIT	669246.7869	1684875.8999
501	669474.3460	1685377.9770	4054.82	TU/US-C515-BLDGCOR	669280.3182	1684889.5189
502	669485.4880	1685386.3880	4055.07	TU/US-C515-BLDGCOR	669291.4570	1684897.9275
503	669257.8420	1685415.0700	4053.20	TU/US-C513-STATION3	669063.8770	1684926.6012
504	669241.6200	1685431.8260	4053.43	TU/US-C513-STATION2	669047.6597	1684943.3523
505	669234.6840	1685421.2410	4053.75	TU/US-C513-STATION5	669040.7257	1684932.7704
506	669232.2550	1685409.8190	4053.42	TU/US-C513-STATION4	669038.2974	1684921.3517

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

Corrections

Point #515
TU/US-515-MW3 PVC

Point #518
TU/US-515-MW2

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
507	669220.1400	1685422.8010	4053.52	TU/US-C513-STATION1	669026.1859	1684934.3299
508	669222.4590	1685431.2530	4053.64	TU/US-C513-TANKPIT	669028.5042	1684942.7795
509	669219.3990	1685411.0450	4054.92	TU/US-C513-TANKPIT	669025.4451	1684922.5773
510	669260.7320	1685426.0370	4053.70	TU/US-C513-TANKPIT	669066.7661	1684937.5650
511	669277.6950	1685433.5720	4053.31	TU/US-C513-MW2-CASIN	669083.7242	1684945.0978
512	669243.5650	1685418.8110	4054.36	TU/US-C513-TRANSPAD	669049.6041	1684930.3411
513	669236.4970	1685419.8090	4054.30	TU/US-C513-TRANSPAD	669042.5381	1684931.3388
514	669235.5680	1685411.9050	4054.57	TU/US-C513-TRANSPAD	669041.6094	1684923.4371
515	669277.6850	1685433.6210	4053.26	TU/US-C513-MW2-C[illegible] PVC	669083.7142	1684945.1468 → MW3
516	669188.9570	1685441.5400	4053.76	TU/US-C513-MW1-CASIN	668995.0119	1684953.0635
517	669188.7180	1685441.6230	4053.31	TU/US-C513-MW1-PVC	668994.7730	1684953.1465
518	669175.0530	1685411.5360	4053.78	TU/US-C513-MW3-PVC	668981.1120	1684923.0682 → MW2
519	669175.2900	1685411.4450	4054.15	TU/US-C513-MW3-CASIN	668981.3489	1684922.9772
520	669194.6820	1685411.4540	4054.72	TU/US-C513-BLDGCOR	669000.7353	1684922.9862
521	669205.8290	1685420.1440	4054.47	TU/US-C513-BLDGCOR	669011.8790	1684931.6737
522	669292.6520	1685418.3920	4053.83	TU/US-C513-BLDGCOR	669098.6769	1684929.9222
523	669293.9380	1685428.2990	4053.77	TU/US-C513-BLDGCOR	669099.9625	1684939.8263
524	685879.9040	1686627.7590	4102.02	OTC-534-CASING	685681.1215	1686138.9387
525	685879.6290	1686627.7910	4101.61	OTC-534-PVC	685680.8466	1686138.9707
526	685894.0510	1686651.2940	4102.15	OTC-534-MW6-CASING	685695.2644	1686162.4669
527	685893.7240	1686651.3020	4101.74	OTC-534-MW6-PVC	685694.9375	1686162.4749
528	685866.3710	1686655.8860	4101.59	OTC-534-MW8-PVC	685667.5925	1686167.0576
529	685866.6060	1686655.6520	4102.06	OTC-534-MW8-CASING	685667.8274	1686166.8236
530	685876.1160	1686687.3140	4102.11	OTC-534-MW5-CASING	685677.3346	1686198.4764
531	685875.8760	1686687.4250	4101.81	OTC-534-MW5-PVC	685677.0947	1686198.5874
532	685834.9910	1686704.4610	4101.83	OTC-534-MW9-PVC	685636.2216	1686215.6185
533	685835.2820	1686704.5300	4102.15	OTC-534-MW9-CASING	685636.5125	1686215.6875
534	685772.4780	1686595.2240	4101.45	OTC-534-MW10-NG	685573.7267	1686106.4131
535	669081.1480	1678793.1860	4046.72	OTC-531B-SEPTANK	668887.2342	1678306.6363
536	669082.4390	1678801.3130	4046.63	OTC-531B-SEPTANK	668888.5248	1678314.7610
537	669072.3810	1678802.9790	4046.81	OTC-531B-SEPTANK	668878.4697	1678316.4265
538	669070.8860	1678795.3530	4046.82	OTC-531B-SEPTANK	668876.9751	1678308.8027
539	669104.1410	1678787.7690	4045.69	OTC-531B-STATION-1	668910.2205	1678301.2209
540	669070.9690	1678801.9800	4046.52	OTC-531B-STATION-2	668877.0581	1678315.4278
541	669061.4820	1678787.2510	4046.24	OTC-531B-STATION-3	668867.5739	1678300.7031
542	669022.2810	1678760.4940	4045.98	OTC-531B-MW-1-PVC	668828.3842	1678273.9538
543	669022.4740	1678760.4670	4046.35	OTC-531B-MW-1-CASING	668828.5772	1678273.9268
544	669029.7060	1678750.8610	4046.12	OTC-531B-LEACH	668835.8071	1678264.3236
545	669044.0770	1678753.3070	4046.04	OTC-531B-LEACH	668850.1739	1678266.7689
546	669048.2090	1678762.3910	4046.19	OTC-531B-LEACH	668854.3047	1678275.8503
547	669052.8600	1678773.5200	4046.17	OTC-531B-LEACH	668858.9544	1678286.9760
548	669051.8580	1678782.0380	4046.19	OTC-531B-LEACH	668857.9527	1678295.4916
549	669045.9680	1678791.0410	4045.97	OTC-531B-LEACH	668852.0644	1678304.4920
550	669037.6080	1678787.3270	4046.05	OTC-531B-LEACH	668843.7068	1678300.7790
551	669030.8940	1678787.9690	4046.07	OTC-531B-LEACH	668836.9947	1678301.4208
552	669024.6850	1678794.4050	4045.99	OTC-531B-LEACH	668830.7875	1678307.8550
553	669012.0060	1678808.0140	4045.98	OTC-531B-LEACH	668818.1122	1678321.4600
554	669005.0390	1678788.3970	4045.95	OTC-531B-LEACH	668811.1472	1678301.8487
555	669008.1540	1678771.5710	4046.05	OTC-531B-LEACH	668814.2613	1678285.0276
556	669012.3090	1678761.0960	4046.10	OTC-531B-LEACH	668818.4151	1678274.5556
557	669052.5660	1678784.6580	4046.08	OTC-531B-FLINE	668858.6605	1678298.1108
558	669071.4380	1678798.9230	4046.55	OTC-531B-FLINE	668877.5270	1678312.3717
559	669082.2160	1678797.7200	4046.58	OTC-531B-ELINE	668888.3019	1678311.1690
560	669109.7160	1678792.3340	4045.64	OTC-531B-ELINE	668915.7939	1678305.7846
561	669130.6340	1678787.5660	4047.05	OTC-531B-ELINE	668936.7058	1678301.0180
562	669132.6960	1678800.0880	4046.87	OTC-531B-BLDGCOR	668938.7672	1678313.5363
563	669139.6540	1678804.9540	4046.97	OTC-531B-BLDGCOR	668945.7232	1678318.4009
564	669127.3740	1678771.5760	4046.72	OTC-531B-BLDGCOR	668933.4468	1678285.0326
565	669131.8520	1678764.6150	4047.25	OTC-531B-BLDGCOR	668937.9235	1678278.0736
566	668593.1300	1678901.9680	4046.19	OTC-531C-BLDGCOR	668399.3576	1678415.3868
567	668588.1250	1678902.8360	4046.21	OTC-531C-BLDGCOR	668394.3541	1678416.2546
568	668585.3350	1678865.5840	4046.55	OTC-531C-BLDGCOR	668391.5649	1678379.0133
569	668590.1110	1678858.6070	4046.53	OTC-531C-BLDGCOR	668396.3395	1678372.0384
570	668590.3090	1678889.4560	4045.95	OTC-531C-ELINE	668396.5374	1678402.8784
571	668578.4210	1678891.4650	4046.03	OTC-531C-ELINE	668384.6529	1678404.8868
572	668560.7680	1678894.7530	4045.47	OTC-531C-ELINE	668367.0050	1678408.1739
573	668535.6480	1678899.2930	4046.35	OTC-531C-ELINE	668341.8923	1678412.7126
574	668535.0660	1678896.4960	4046.68	OTC-531C-SEPTIC	668341.3104	1678409.9164
575	668535.3940	1678905.9700	4046.47	OTC-531C-SEPTIC	668341.6383	1678419.3876
576	668522.2510	1678906.9450	4046.51	OTC-531C-SEPTIC	668328.4992	1678420.3624
577	668522.3100	1678897.4040	4046.39	OTC-531C-SEPTIC	668328.5581	1678410.8241

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
578	668561.9930	1678890.5660	4045.66	OTC-531C-STATION-1	668368.2296	1678403.9881
579	668531.2500	1678902.0810	4046.55	OTC-531C-STATION-2	668337.4955	1678415.4998
580	668522.9580	1678893.5110	4045.84	OTC-531C-STATION-3	668329.2059	1678406.9323
581	668521.6100	1678902.7660	4046.16	OTC-531C-FLINE	668327.8583	1678416.1846
582	668515.2610	1678901.5740	4045.66	OTC-531C-FLINE	668321.5112	1678414.9929
583	668515.8520	1678907.4010	4045.67	OTC-531C-LEACH	668322.1020	1678420.8182
584	668498.6960	1678906.8280	4045.81	OTC-531C-LEACH	668304.9510	1678420.2454
585	668489.9270	1678907.6430	4045.74	OTC-531C-LEACH	668296.1845	1678421.0602
586	668481.5760	1678902.8790	4045.69	OTC-531C-LEACH	668287.8359	1678416.2975
587	668476.1180	1678891.3230	4045.84	OTC-531C-LEACH	668282.3795	1678404.7449
588	668473.4290	1678883.0340	4045.68	OTC-531C-LEACH	668279.6913	1678396.4583
589	668473.7340	1678874.2510	4045.53	OTC-531C-LEACH	668279.9962	1678387.6778
590	668476.2360	1678867.2340	4045.54	OTC-531C-LEACH	668282.4975	1678380.6629
591	668482.1720	1678868.3950	4045.45	OTC-531C-MW-1-PVC	668288.4318	1678381.8235
592	668482.4510	1678868.3680	4045.85	OTC-531C-MW-1-CASING	668288.7107	1678381.7965
593	668490.9400	1678863.0190	4045.60	OTC-531C-LEACH	668297.1972	1678376.4491
594	668503.3450	1678866.8310	4045.87	OTC-531C-LEACH	668309.5986	1678380.2600
595	668508.4050	1678874.1920	4045.93	OTC-531C-LEACH	668314.6572	1678387.6189
596	668515.8970	1678879.7420	4045.82	OTC-531C-LEACH	668322.1470	1678393.1672
597	668524.3970	1678890.3500	4045.70	OTC-531C-LEACH	668330.6445	1678403.7722
598	667495.6300	1679128.7300	4042.53	OTC-532-BLDGCOR	667302.1757	1678642.0831
599	667488.6400	1679123.9580	4042.71	OTC-532-BLDGCOR	667295.1877	1678637.3125
600	667462.6660	1679059.4970	4041.10	OTC-532-BLDGCOR	667269.2212	1678572.8701
601	667481.1840	1679050.1710	4042.61	OTC-532-BLDGCOR	667287.7339	1678563.5469
602	667486.0130	1679106.7520	4042.73	OTC-532-ELINE	667292.5615	1678620.1115
603	667462.4800	1679111.5030	4040.38	OTC-532-ELINE	667269.0353	1678624.8611
604	667462.2250	1679114.4150	4040.62	OTC-532-STATION-1	667268.7804	1678627.7722
605	667442.0090	1679119.1410	4041.24	OTC-532-STATION-2	667248.5702	1678632.4969
606	667419.1640	1679115.1840	4040.86	OTC-532-STATION-3	667225.7319	1678628.5410
607	667385.6930	1679101.6040	4040.50	OTC-532-STATION-4	667192.2706	1678614.9649
608	667381.8850	1679101.5680	4040.62	OTC-532-LEACH	667188.4637	1678614.9290
609	667383.6400	1679091.6130	4040.63	OTC-532-LEACH	667190.2181	1678604.9768
610	667385.4250	1679087.0370	4040.57	OTC-532-LEACH	667192.0026	1678600.4022
611	667388.9960	1679084.4040	4040.65	OTC-532-LEACH	667195.5726	1678597.7699
612	667394.2390	1679084.6140	4040.73	OTC-532-LEACH	667200.8141	1678597.9799
613	667396.1210	1679092.7430	4040.70	OTC-532-LEACH	667202.6955	1678606.1065
614	667398.1240	1679100.9150	4040.70	OTC-532-LEACH	667204.6979	1678614.2761
615	667402.2360	1679106.9240	4040.75	OTC-532-LEACH	667208.8088	1678620.2834
616	667410.1270	1679109.8530	4040.82	OTC-532-LEACH	667216.6975	1678623.2116
617	667419.4540	1679110.1630	4040.85	OTC-532-LEACH	667226.0218	1678623.5215
618	667420.7270	1679120.1400	4041.02	OTC-532-FLINE	667227.2944	1678633.4956
619	667423.8510	1679141.7780	4040.59	OTC-532-LEACH	667230.4175	1678655.1273
620	667412.2990	1679143.4760	4040.74	OTC-532-LEACH	667218.8688	1678656.8248
621	667403.7350	1679143.1670	4040.80	OTC-532-LEACH	667210.3073	1678656.5159
622	667397.0900	1679139.6510	4040.75	OTC-532-LEACH	667203.6642	1678653.0009
623	667384.3300	1679127.9250	4040.44	OTC-532-LEACH	667190.9079	1678641.2783
624	667382.6070	1679116.1130	4040.44	OTC-532-LEACH	667189.1854	1678629.4697
625	667430.4810	1679118.6630	4041.32	OTC-532-FLINE	667237.0456	1678632.0190
626	667430.2210	1679114.2980	4041.25	OTC-532-SEPTIC	667236.7856	1678627.6553
627	667440.5880	1679113.0200	4041.26	OTC-532-SEPTIC	667247.1496	1678626.3776
628	667442.9470	1679123.3120	4041.21	OTC-532-SEPTIC	667249.5080	1678636.6667
629	667430.1210	1679125.8580	4041.28	OTC-532-SEPTIC	667236.6857	1678639.2119
630	667441.8110	1679116.2010	4041.27	OTC-532-ELINE	667248.3723	1678629.5577
631	669659.5140	1678688.1920	4048.05	OTC-531A-ELINE	669465.4326	1678201.6728
632	669645.1200	1678691.4170	4047.42	OTC-531A-ELINE	669451.0427	1678204.8968
633	669626.5240	1678694.6570	4048.54	OTC-531A-ELINE	669432.4521	1678208.1359
634	669625.4550	1678690.5680	4048.58	OTC-531A-SEPTIC	669431.3834	1678204.0481
635	669627.0130	1678697.2200	4048.59	OTC-531A-SEPTIC	669432.9410	1678210.6981
636	669614.1180	1678700.1730	4048.60	OTC-531A-SEPTIC	669420.0497	1678213.6503
637	669613.0940	1678693.8150	4048.72	OTC-531A-SEPTIC	669419.0260	1678207.2941
638	669648.5430	1678685.0250	4047.24	OTC-531A-STATION-1	669454.4647	1678198.5067
639	669615.3510	1678691.9600	4048.59	OTC-531A-STATION-2	669421.2823	1678205.4397
640	669607.0140	1678691.1700	4048.42	OTC-531A-STATION-3	669412.9478	1678204.6499
641	669606.7200	1678688.2040	4048.56	OTC-531A-LEACH	669412.6539	1678201.6848
642	669608.9270	1678706.1330	4048.28	OTC-531A-LEACH	669414.8602	1678219.6086
643	669601.3790	1678707.8980	4048.13	OTC-531A-LEACH	669407.3144	1678221.3730
644	669593.2420	1678708.2220	4047.49	OTC-531A-LEACH	669399.1798	1678221.6970
645	669578.1380	1678708.5010	4047.22	OTC-531A-LEACH	669384.0801	1678221.9759
646	669565.0490	1678706.1840	4047.29	OTC-531A-LEACH	669370.9949	1678219.6595
647	669554.2260	1678694.3690	4047.37	OTC-531A-LEACH	669360.1751	1678207.8480
648	669553.4160	1678687.6760	4047.59	OTC-531A-LEACH	669359.3653	1678201.1569

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
649	669552.5940	1678678.4030	4047.76	OTC-531A-LEACH	669358.5435	1678191.8866
650	669550.0120	1678656.4050	4047.76	OTC-531A-LEACH	669355.9623	1678169.8950
651	669556.1880	1678652.3190	4047.86	OTC-531A-LEACH	669362.1365	1678165.8102
652	669559.2580	1678655.8340	4047.38	OTC-531A-MW-1-PVC	669365.2056	1678169.3241
653	669559.5100	1678655.7600	4047.78	OTC-531A-MW-1-CASING	669365.4575	1678169.2502
654	669561.9190	1678650.8880	4047.69	OTC-531A-LEACH	669367.8658	1678164.3796
655	669569.0970	1678659.8040	4048.02	OTC-531A-LEACH	669375.0418	1678173.2930
656	669574.5390	1678669.0420	4047.77	OTC-531A-LEACH	669380.4822	1678182.5283
657	669580.0480	1678677.6210	4047.77	OTC-531A-LEACH	669385.9896	1678191.1048
658	669581.1180	1678685.2190	4047.72	OTC-531A-LEACH	669387.0593	1678198.7006
659	669589.3790	1678690.0080	4047.91	OTC-531A-LEACH	669395.3179	1678203.4882
660	669598.7410	1678687.4540	4047.88	OTC-531A-LEACH	669404.6772	1678200.9350
661	669608.6000	1678697.8630	4048.38	OTC-531A-FLINE	669414.5333	1678211.3410
662	669613.4950	1678697.0050	4048.61	OTC-531A-FLINE	669419.4269	1678210.4832
663	669434.7190	1685385.1220	4055.15	US/TC-515-EXAVATION	669240.7027	1684896.6618
664	669433.7320	1685375.0770	4054.68	US/TC-515-EXAVATION	669239.7160	1684886.6198
665	669453.6100	1685372.2880	4054.89	US/TC-515-EXAVATION	669259.5882	1684883.8316
666	669455.2490	1685382.6100	4055.08	US/TC-515-EXAVATION	669261.2268	1684894.1506
667	669423.1290	1685379.3360	4054.73	US/TC-515-POTHOLE-1	669229.1161	1684890.8775
668	669443.7270	1685362.1260	4054.20	US/TC-515-POTHOLE-2	669249.7081	1684873.6725
669	669443.2340	1685352.4030	4053.69	US/TC-515-POTHOLE-3	669249.2152	1684863.9523
670	669388.8600	1685382.9350	4054.36	US/TC-515-POTHOLE-4	669194.8570	1684894.4755
671	666075.3380	1693454.3920	4059.75	US/TC-502-TANK/EX	665882.2953	1692963.5932
672	666064.5480	1693454.6090	4059.59	US/TC-502-TANK/EX	665871.5084	1692963.8101
673	666064.5890	1693463.2320	4059.66	US/TC-502-TANK/EX	665871.5494	1692972.4306
674	666075.7420	1693463.6580	4059.85	US/TC-502-TANK/EX	665882.6992	1692972.8565
675	666070.2430	1693458.8620	4059.56	US/TC-502-STATION-1	665877.2018	1692968.0619
676	666075.3470	1693459.1030	4059.61	US/TC-502-STATION-2	665882.3043	1692968.3028
677	666070.4890	1693455.0470	4059.46	US/TC-502-STATION-3	665877.4477	1692964.2480
678	666070.2650	1693463.1340	4059.49	US/TC-502-STATION-4	665877.2238	1692972.3327
679	666072.2440	1693503.2780	4060.12	US/TC-502-FIREHY	665879.2022	1693012.4650
680	669813.9600	1693315.1950	4077.70	US/TC-503-EXAVATION	669619.8338	1692824.4365
681	669826.0790	1693326.7460	4077.45	US/TC-503-EXAVATION	669631.9493	1692835.9842
682	669815.4720	1693337.1950	4077.67	US/TC-503-EXAVATION	669621.3454	1692846.4302
683	669803.8000	1693324.4750	4077.59	US/TC-503-EXAVATION	669609.6767	1692833.7139
684	669818.2990	1693319.1730	4077.48	US/TC-503-BEGTRENCH	669624.1715	1692828.4134
685	669837.0790	1693303.2490	4076.88	US/TC-503-ENDTRENCH	669642.9461	1692812.4940
686	681138.0180	1690539.4590	4109.33	OTC-538-STATION-5	680940.6098	1690049.5050
687	673758.3950	1683356.5480	4060.55	US/TC-514-STATION-1	673563.1256	1682868.6758
688	673765.5540	1683358.1250	4060.47	US/TC-514-STATION-2	673570.2825	1682870.2523
689	673770.0890	1683350.4240	4060.48	US/TC-514-STATION-3	673574.8162	1682862.5535
690	673768.2490	1683354.2670	4060.48	US/TC-514-STATION-4	673572.9768	1682866.3954
691	673777.4280	1683353.4050	4060.71	US/TC-514-STATION-5	673582.1531	1682865.5337
692	673776.8350	1683359.0390	4060.94	US/TC-514-BLDGCOR	673581.5603	1682871.1661
693	673769.7480	1683353.9100	4060.70	US/TC-514-BLDGCOR	673574.4753	1682866.0385
694	673778.8570	1683370.4750	4060.92	US/TC-514-BLDGCOR	673583.5817	1682882.5987
695	673773.9440	1683377.3380	4060.70	US/TC-514-BLDGCOR	673578.6701	1682889.4597
696	673723.3370	1683411.0030	4060.56	US/TC-514-MW-1-PVC	673528.0778	1682923.1150
697	673723.6160	1683410.9000	4061.02	US/TC-514-MW-1-CASIN	673528.3567	1682923.0120
698	673699.2890	1683380.7720	4061.09	US/TC-514-MW-2-CASIN	673504.0367	1682892.8928
699	673698.9660	1683380.8260	4060.66	US/TC-514-MW-2-PVC	673503.7138	1682892.9467
700	673812.5550	1683317.4880	4060.43	US/TC-514-MW-3-PVC	673617.2699	1682829.6271
701	673812.8820	1683317.4350	4060.76	US/TC-514-MW-3-CASIN	673617.5968	1682829.5741
702	673776.7270	1683350.1350	4060.82	US/TC-514-FORM/TANK	673581.4523	1682862.2646
703	673777.3420	1683356.4370	4060.94	US/TC-514-FORM/TANK	673582.0671	1682868.5648
704	673759.1130	1683359.4810	4061.06	US/TC-514-FORM/TANK	673563.8434	1682871.6079
705	673757.7990	1683353.3170	4061.32	US/TC-514-FORM/TANK	673562.5298	1682865.4457
706	678061.9490	1684350.2580	4078.63	US/TC-516-FORMTANK	677865.4323	1683862.0978
707	678072.0100	1684348.4740	4078.61	US/TC-516-FORMTANK	677875.4904	1683860.3143
708	678074.0860	1684360.1530	4078.25	US/TC-516-FORMTANK	677877.5658	1683871.9899
709	678065.1290	1684362.4260	4078.47	US/TC-516-FORMTANK	677868.6114	1683874.2622
710	678069.6040	1684359.8850	4078.30	US/TC-516-STATION-1	677873.0851	1683871.7220
711	678064.5960	1684356.9350	4078.34	US/TC-516-STATION-2	677868.0786	1683868.7728
712	678066.1670	1684350.4200	4078.54	US/TC-516-STATION-3	677869.6491	1683862.2597
713	678072.9250	1684354.8490	4078.09	US/TC-516-STATION-4	677876.4052	1683866.6874
714	678101.7280	1684311.2380	4077.72	US/TC-516-MW-2	677905.1998	1683823.0891
715	678116.9250	1684291.3650	4077.78	US/TC-516-MW-2	677920.3924	1683803.2218
716	678061.7680	1684335.2520	4080.38	US/TC-516-BLDGCOR	677865.2514	1683847.0961
717	678064.6310	1684348.2080	4081.07	US/TC-516-BLDGCOR	677868.1136	1683860.0484
718	678026.7560	1684390.7900	4078.49	US/TC-516-MW-1	677830.2495	1683902.6180
719	678014.0050	1684363.8290	4077.81	US/TC-516-MW-3	677817.5022	1683875.6648

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
720	671269.9880	1692357.3370	4075.08	US/TC-508-FORM/TANK	671075.4398	1691866.8562
721	671299.4450	1692330.8640	4075.18	US/TC-508-FORM/TANK	671104.8883	1691840.3908
722	671324.3300	1692358.5130	4075.17	US/TC-508-FORM/TANK	671129.7661	1691868.0318
723	671294.8560	1692384.8580	4075.02	US/TC-508-FORM/TANK	671100.3006	1691894.3692
724	671311.5950	1692346.0080	4075.12	US/TC-508-STATION-2	671117.0347	1691855.5304
725	671302.2680	1692357.1830	4075.07	US/TC-508-STATION-1	671107.7104	1691866.7022
726	671312.4640	1692368.2800	4074.98	US/TC-508-STATION-4	671117.9035	1691877.7960
727	671282.5110	1692369.9060	4075.01	US/TC-508-STATION-3	671087.9592	1691879.4215
728	671289.2400	1692342.4620	4075.15	US/TC-508-STATION-5	671094.6862	1691851.9855
729	671373.3210	1692386.6060	4075.00	US/TC-508-MW-3-PVC	671178.7429	1691896.1167
730	671373.6120	1692386.5000	4075.33	US/TC-508-MW-3-CASIN	671179.0338	1691896.0107
731	671216.9160	1692488.1670	4075.54	US/TC-508-SS18-MW08-CASIN	671022.3832	1691997.6482
732	671216.7110	1692488.4340	4075.26	US/TC-508-SS18-MW08-PVC	671022.1782	1691997.9152
733	671236.3110	1692301.9320	4075.19	US/TC-508-MW-2-CASIN	671041.7726	1691811.4672
734	671236.1240	1692302.1450	4074.80	US/TC-508-MW-2-PVC	671041.5856	1691811.6801
735	671211.3090	1692324.4610	4075.35	US/TC-508-MW-1-CASIN	671016.7778	1691833.9897
736	671211.0360	1692324.6620	4074.93	US/TC-508-MW-1-PVC	671016.5049	1691834.1906
737	671174.1880	1692241.9700	4074.81	US/TC-508-SS18-MW16-PVC	670979.6676	1691751.5226
738	671174.4770	1692241.7880	4075.34	US/TC-508-SS18-MW16-CASIN	670979.9565	1691751.3406
739	671035.8870	1692106.1030	4074.42	US/TC-508-SS18-MW18-CASIN	670841.4066	1691615.6950
740	671035.6230	1692106.3690	4073.74	US/TC-508-SS18-MW18-PVC	670841.1427	1691615.9609
741	671043.1730	1692355.2630	4075.73	US/TC-508-SS18-MW19-PVC	670848.6905	1691864.7828
742	670383.2120	1691278.5670	4072.57	US/TC-504-MW-2-CASIN	670188.9208	1690788.3988
743	670383.0220	1691278.7790	4072.19	US/TC-504-MW-2-PVC	670188.7309	1690788.6107
744	670343.7050	1691297.2270	4072.57	US/TC-504-MW-1-PVC	670149.4253	1690807.0534
745	670343.9460	1691296.8630	4072.80	US/TC-504-MW-1-CASIN	670149.6662	1690806.6895
746	669680.3630	1678704.0610	4048.54	OTC-531A-BLDGCOR	669486.2755	1678217.5372
747	669673.4280	1678699.1340	4048.44	OTC-531A-BLDGCOR	669479.3425	1678212.6116
748	669662.1160	1678671.3190	4048.32	OTC-531A-BLDGCOR	669468.0338	1678184.8047
749	669671.0810	1678657.6480	4048.29	OTC-531A-BLDGCOR	669476.9962	1678171.1376
750	669671.6690	1678686.6260	4048.54	OTC-531A-ELINE	669477.5840	1678200.1072
751	670995.2900	1691723.6540	4072.55	US/TC-500-STATION-6	670800.8214	1691233.3568
752	682707.7150	1693994.3080	4139.12	OTC-539-SEPTIC	682509.8519	1693503.3527
753	682707.1360	1693987.5070	4139.01	OTC-539-SEPTIC	682509.2731	1693496.5537
754	682713.9270	1693987.3840	4139.07	OTC-539-SEPTIC	682516.0621	1693496.4307
755	682714.4020	1693993.8490	4139.12	OTC-539-SEPTIC	682516.5370	1693502.8939
756	682710.5050	1693994.2530	4139.11	OTC-539-ELINE	682512.6411	1693503.2977
757	682711.7750	1694038.3560	4139.83	OTC-539-ELINE	682513.9107	1693547.3880
758	682709.6340	1694009.1330	4139.38	OTC-539-STATION-1	682511.7704	1693518.1734
759	682715.9010	1693990.7160	4139.12	OTC-539-STATION-2	682518.0355	1693499.7618
760	682707.9950	1693985.7400	4139.05	OTC-539-STATION-3	682510.1318	1693494.7872
761	682690.1540	1693966.7430	4138.58	OTC-539-STATION-4	682492.2960	1693475.7957
762	682700.5510	1693984.6270	4139.10	OTC-539-LEACH	682502.6900	1693493.6745
763	682694.7220	1693978.9800	4138.75	OTC-539-LEACH	682496.8627	1693488.0292
764	682685.8570	1693975.5370	4138.62	OTC-539-LEACH	682488.0002	1693484.5872
765	682686.8260	1693963.6500	4138.56	OTC-539-LEACH	682488.9690	1693472.7036
766	682690.9260	1693959.9730	4138.78	OTC-539-LEACH	682493.0678	1693469.0277
767	682696.9840	1693956.9410	4138.94	OTC-539-LEACH	682499.1240	1693465.9966
768	682705.4410	1693958.5980	4139.12	OTC-539-LEACH	682507.5786	1693467.6531
769	682714.7430	1693968.3290	4139.32	OTC-539-LEACH	682516.8779	1693477.3813
770	682721.4010	1693976.8710	4139.30	OTC-539-LEACH	682523.5339	1693485.9208
771	682717.7930	1693983.8070	4139.35	OTC-539-LEACH	682519.9270	1693492.8548
772	682710.1830	1693984.5790	4139.16	OTC-539-FLINE	682512.3192	1693493.6265
773	682710.2190	1693987.2160	4139.18	OTC-539-FLINE	682512.3552	1693496.2628
774	682690.6020	1694039.4720	4139.43	OTC-539-BLDGCOR	682492.7439	1693548.5036
775	682684.8200	1694045.5030	4139.27	OTC-539-BLDGCOR	682486.9635	1693554.5329
776	682741.4000	1694039.0240	4140.22	OTC-539-BLDGCOR	682543.5271	1693548.0558
777	682747.1830	1694045.0970	4140.68	OTC-539-BLDGCOR	682549.3085	1693554.1270

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7824
PROFESSIONAL SURVEYOR

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
778	686068.4560	1686694.7280	4103.68	OTC-534-MW-10-PVC	685869.6189	1686205.8883
779	686068.7800	1686694.7810	4104.06	OTC-534-MW-10-CASING	685869.9428	1686205.9413
780	685846.6180	1686522.2590	4102.52	OTC-534-MW-11-CASING	685647.8452	1686033.4693
781	685846.3620	1686522.2240	4102.15	OTC-534-MW-11-PVC	685647.5893	1686033.4343
782	685670.3280	1686561.9490	4102.29	OTC-534-MW-12-PVC	685471.6063	1686073.1478
783	685670.6410	1686561.9860	4102.69	OTC-534-MW-12-CASING	685471.9192	1686073.1848

RAW DATA

HOLLOMAN AIR FORCE BASE
WEST SITE

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	684793.2210	1611172.5300	3911.93	BASE	684598.9178	1610715.3759
2	682531.9480	1628747.6200	3965.57	EC-30	682338.2864	1628285.4792
3	682452.1330	1628714.0920	3957.20	EC-30-2	682258.4940	1628251.9607
4	698323.2620	1606321.3780	3915.08	CHAS	698125.1198	1605865.6004
5	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
60	616427.1730	1576921.6540	3941.67	LUCERO	616252.2680	1576474.2182
61	600657.7750	1576446.9260	4131.58	GERI	600487.3444	1575999.6249
62	614156.5210	1568701.1170	4227.09	SW 30	613982.2602	1568256.0137
63	575518.1130	1586543.7100	4038.20	BRYCE AZ MK	575354.8155	1586093.5441
64	576512.9440	1582067.6800	4357.70	BRYCE	576349.3642	1581618.7841
65	633185.2600	1566510.7280	4417.64	HORN	633005.6000	1566066.2462
66	580320.9040	1585783.2080	4128.59	NICK 2	580156.2437	1585333.2579
67	682452.1790	1628714.1810	3957.10	EC-30-2	682258.5400	1628252.0496
68	698323.2620	1606321.3780	3914.70	CHAS	698125.1198	1605865.6004
69	698212.0050	1609477.2870	3928.40	CHUCK	698013.8943	1609020.6139
70	682531.9020	1628747.5310	3965.57	EC-30	682338.2404	1628285.3902
71	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
100	684194.1900	1611160.8710	3912.56	USTC-518-NG	684000.0567	1610703.7202
101	684194.8810	1611165.7430	3912.33	USTC-518-NG	684000.7475	1610708.5908
102	684188.7970	1611168.5190	3912.27	USTC-518-NG	683994.6653	1610711.3660
103	684189.4230	1611176.5450	3912.53	USTC-518-NG	683995.2911	1610719.3898
104	684179.6480	1611178.5150	3912.57	USTC-518-NG	683985.5189	1610721.3592
105	684178.1630	1611171.1680	3912.37	USTC-518-NG	683984.0343	1610714.0143
106	684177.1790	1611163.0630	3913.00	USTC-518-NG	683983.0506	1610705.9116
107	684157.6940	1611173.6700	3912.42	USTC-518-STATION-5	683963.5711	1610716.5156
108	684176.2170	1611179.5100	3912.28	USTC-518-STATION-4	683982.0888	1610722.3539
109	684175.8730	1611172.3430	3912.51	USTC-518-STATION-2	683981.7449	1610715.1890
110	684173.8830	1611163.3430	3912.65	USTC-518-STATION-3	683979.7555	1610706.1915
111	684189.5770	1611170.0220	3912.30	USTC-518-STATION-1	683995.4450	1610712.8686
112	684160.3220	1611172.8640	3912.49	USTC-518-POTHOLE-1	683966.1984	1610715.7098
113	684125.1520	1611185.2360	3910.93	USTC-518-MW-1	683931.0383	1610728.0783
114	684130.9190	1611216.0540	3911.17	USTC-518-MW-2	683936.8037	1610758.8876
115	684158.8770	1611187.1610	3912.34	USTC-518-BLDGCORN-70	683964.7538	1610730.0028
116	684163.9700	1611180.4420	3912.46	USTC-518-BLDGCORN-70	683969.8453	1610723.2857
117	684211.6690	1611174.1790	3912.47	USTC-518-BLDGCORN-70	684017.5308	1610717.0244
118	684218.3800	1611179.3060	3912.45	USTC-518-BLDGCORN-70	684024.2399	1610722.1500
119	684236.0190	1611144.8000	3911.88	USTC-518-NAIL	684041.8739	1610687.6538
120	684242.7800	1611133.9130	3911.77	USTC-518-NAIL	684048.6330	1610676.7699
121	684203.7200	1611162.6570	3912.21	USTC-518-STATION-6	684009.5840	1610705.5057

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7924
PROFESSIONAL SURVEYOR

Appendix F
Laboratory Analytical Data and Data Validation Checklists

Note: The data validation checklists and laboratory analytical data reports are provided as separate files.

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-076

Appendix G
Waste Manifests

HAFB-001

Generator's Name	Generator's Address	Generator's Telephone No.
USAF	550 TABOSA AVE Holloman AFB NM 88330	575-491-8262

Origin of Special Waste (Project or Spill Location): ~~White Sands National Monument Park - Storage Lagoons~~ Holloman AFB NM Bldg # 55

Transporter #1 Company Name	Address	Telephone No.
Southwest Disposal	1350 LaVelle Road	575-434-1109
Transporter #2 Company Name	Address	Telephone No.
	Alamogordo, NM 88310	

Destination Facility Name/Site Address	Facility ID (Permit) Number	Telephone No.
Otero/Greentree Regional Landfill 24 Mls South of Alamogordo, Hwy 54	SWM-109102	575-439-4355

Type and Proper Name of Special Waste	Container(s) No.	Container(s) Type	Total Quantity	Unit Wt/Vol	
Non RCRA/Non Hazardous Substance ~~(Treatment Plant Lagoon Sludge)~~ (soil)		SD		6.95	Tons

Additional Descriptions for Special Waste Listed Above:

Site Contact: Todd Hiltunen 307-214-6080

Special Handling Instructions:

Southwest Disposal - Lined and Covered Roll-off

GENERATOR'S CERTIFICATION I hereby certify that the contents of this shipment are fully and accurately described above by type and proper name of the special waste, and that such waste has been managed, packaged, containerized and labeled in accordance with the requirements of 20.9.8 NMAC (Special Waste Requirements) in addition to any other applicable federal, state or local regulations.

Truck # 553 Bin #

Printed/Typed Name:	Signature:	Date:
Todd Hiltunen for Brent Hunt (CES)	for Brent Hunt (CES)	9/25/12

Transporter 1 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:
David Gurnbach		9/26/12

Transporter 2 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:

Discrepancy Indication Space:

Analytical supplied to landfill

no facility ID number

Facility Owner or Operator: ***I hereby acknowledge receipt of the special waste as indicated upon this manifest, except as noted above in the Discrepancy Indication Space.***

Printed/Typed Name:	Signature:	Date:
Darrell McGinnis / Attendant		9-26-12

~~Facility~~

OTERO/GREENTREE
REGIONAL LANDFILL

TRANSACTION: 28,080

CO. NAME:

ADDRESS: Environmental Waste Solutions
1348 B. Redtail Hawk Drive

CITY & STATE: Boardman, OH 44512

DATE: 9/26/12 TIME: 9:07 am

TRUCK NO.: 198

GROSS WEIGHT 47000

TARE WEIGHT: 33100

NET TONS: 13900 6.95

COST $: [redacted]

5% TAX $:

TOTAL DUE $:

WASTE: 5

WASTE DESC.: Construction Debris
H.A.F.B.

WASTE ORIGIN:

DRIVER

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-076

Appendix H
Risk Evaluation Calculations

Table H-1

Site-specific
Resident Equation Inputs for Soil

Variable	Value
TR (target cancer risk) unitless	0.00001
ED_r (exposure duration - resident) year	30
ET_r (exposure time - resident) hour	24
ED_c (exposure duration - child) year	6
ED_a (exposure duration - adult) year	24
BW_a (body weight - adult) kg	70
BW_c (body weight - child) kg	15
SA_a (skin surface area - adult) cm^2/day	5700
SA_c (skin surface area - child) cm^2/day	2800
THQ (target hazard quotient) unitless	1
LT (lifetime - resident) year	70
EF_r (exposure frequency) day/year	350
IRS_a (soil intake rate - adult) mg/day	100
IRS_c (soil intake rate - child) mg/day	200
AF_a (skin adherence factor - adult) mg/cm^2	0.07
AF_c (skin adherence factor - child) mg/cm^2	0.2
IFS_{adj} (age-adjusted soil ingestion factor) mg-year/kg-day	114
DFS_{adj} (age-adjusted soil dermal factor) mg-year/kg-day	361
$IFSM_{adj}$ (mutagenic age-adjusted soil ingestion factor) mg-year/kg-day	489.5
$DFSM_{adj}$ (mutagenic age-adjusted soil dermal factor) mg-year/kg-day	1445
ED_{0-2} (exposure duration first phase) year	2
ED_{2-6} (exposure duration second phase) year	4
ED_{6-16} (exposure duration third phase) year	10
ED_{16-30} (exposure duration fourth phase) year	14
City (Climate Zone) PEF Selection	Albuquerque, NM
A_s (acres) PEF Selection	0.5
Q/C_{wp} (g/m^2-s per kg/m^3) PEF Selection	81.84859
PEF (particulate emission factor) m^3/kg	6609630595
A (PEF Dispersion Constant)	14.9421
B (PEF Dispersion Constant)	17.9869
C (PEF Dispersion Constant)	205.1782
V (fraction of vegetative cover) unitless	0.5
U_m (mean annual wind speed) m/s	4.02
U_t (equivalent threshold value)	11.32
F(x) (function dependant on U_m/U_t) unitless	0.0553
City (Climate Zone) VF Selection	Default
A_s (acres) VF Selection	0.5
Q/C_{wp} (g/m^2-s per kg/m^3) VF Selection	68.18
foc (fraction organic carbon in soil) g/g	0.0015
ρ$_b$ (dry soil bulk density) g/cm^3	1.5
ρ$_s$ (soil particle density) g/cm^3	2.65
θ$_w$ (water-filled soil porosity) L_{water}/L_{soil}	0.26
T (exposure interval) s	950000000
A (VF Dispersion Constant)	11.911
B (VF Dispersion Constant)	18.4385
C (VF Dispersion Constant)	209.7845

Output generated 11DEC2012:13:06:24

Table H-1

Site-specific
Resident Risk-Based Screening Levels (RSL) for Soil
ca=Cancer, nc=Noncancer, ca* (Where nc SL < 100 x ca SL),
ca** (Where nc SL < 10 x ca SL),
max=SL exceeds ceiling limit (see User's Guide), sat=SL exceeds csat

Chemical	CAS Number	Ingestion SF $(mg/kg\text{-}day)^{-1}$	SFO Ref	Inhalation Unit Risk $(ug/m^3)^{-1}$	IUR Ref	Chronic RfD (mg/kg-day)	RfD Ref	Chronic RfC (mg/m^3)	RfC Ref	GIABS	ABS	Volatilization Factor (m^3/kg)	Soil Saturation Concentration (mg/kg)
Thallium (Soluble Salts)	7440-28-0	-		-		1.00E-05	X	-		1	-	-	-

Output generated 11DEC2012:13:06:24

Table H-1

Particulate Emission Factor (m^3/kg)	Ingestion SL TR=1.0E-5 (mg/kg)	Dermal SL TR=1.0E-5 (mg/kg)	Inhalation SL TR=1.0E-5 (mg/kg)	Carcinogenic SL TR=1.0E-5 (mg/kg)	Ingestion SL HQ=1 (mg/kg)	Dermal SL HQ=1 (mg/kg)	Inhalation SL HQ=1 (mg/kg)	Noncarcinogenic SL HI=1 (mg/kg)	Screening Level (mg/kg)
6.61E+09	-	-	-	-	7.82E-01	-	-	7.82E-01	7.82E-01 nc

Table H-2

Site-specific
Outdoor Worker Equation Inputs for Soil

Variable	Value
TR (target cancer risk) unitless	0.00001
THQ (target hazard quotient) unitless	1
AT_{ow} (averaging time)	365
EF_{ow} (exposure frequency) d/yr	250
ED_{ow} (exposure duration) yr	1
ET_{ow} (exposure time) hr	8
LT (lifetime) yr	70
BW_{ow} (body weight)	70
IR_{ow} (soil ingestion rate) mg/day	330
SA_{ow} (surface area) cm^2/day	3300
AF_{ow} (skin adherence factor) mg/cm^2	0.3
City (Climate Zone) PEF Selection	Albuquerque, NM
A_s (acres) PEF Selection	0.5
Q/C_{wp} (g/m^2-s per kg/m^3) PEF Selection	81.84859
PEF (particulate emission factor) m^3/kg	6609630595
A (PEF Dispersion Constant)	14.9421
B (PEF Dispersion Constant)	17.9869
C (PEF Dispersion Constant)	205.1782
V (fraction of vegetative cover) unitless	0.5
U_m (mean annual wind speed) m/s	4.02
U_t (equivalent threshold value)	11.32
F(x) (function dependant on U_m/U_t) unitless	0.0553
City (Climate Zone) VF Selection	Default
A_s (acres) VF Selection	0.5
Q/C_{wp} (g/m^2-s per kg/m^3) VF Selection	68.18
foc (fraction organic carbon in soil) g/g	0.0015
ρ$_b$ (dry soil bulk density) g/cm^3	1.5
ρ$_s$ (soil particle density) g/cm^3	2.65
θ$_w$ (water-filled soil porosity) L_{water}/L_{soil}	0.26
T (exposure interval) s	950000000
A (VF Dispersion Constant)	11.911
B (VF Dispersion Constant)	18.4385
C (VF Dispersion Constant)	209.7845

Output generated 11DEC2012:10:16:07

Table H-2

Site-specific
Outdoor Worker Risk-Based Screening Levels (RSL) for Soil
ca=Cancer, nc=Noncancer, ca* (Where nc SL < 100 x ca SL),
ca** (Where nc SL < 10 x ca SL),
max=SL exceeds ceiling limit (see User's Guide), sat=SL exceeds csat

Chemical	CAS Number	Ingestion SF $(mg/kg\text{-}day)^{-1}$	SFO Ref	Inhalation Unit Risk $(ug/m^3)^{-1}$	IUR Ref	Subchronic RfD (mg/kg-day)	SRfD Ref	Subchronic RfC (mg/m^3)	SRfC Ref	GIABS	ABS	Volatilization Factor (m^3/kg)	Soil Saturation Concentration (mg/kg)
Thallium (Soluble Salts)	7440-28-0	-		-		4.00E-05	X	-		1	-	-	-

Output generated 11DEC2012:10:16:07

Table H-2

Particulate Emission Factor (m^3/kg)	Ingestion SL TR=1.0E-5 (mg/kg)	Dermal SL TR=1.0E-5 (mg/kg)	Inhalation SL TR=1.0E-5 (mg/kg)	Carcinogenic SL TR=1.0E-5 (mg/kg)	Ingestion SL HQ=1 (mg/kg)	Dermal SL HQ=1 (mg/kg)	Inhalation SL HQ=1 (mg/kg)	Noncarcinogenic SL HI=1 (mg/kg)	Screening Level (mg/kg)
6.61E+09	-	-	-	-	1.24E+01	-	-	1.24E+01	1.24E+01 nc

Table H-3

Site-specific
Composite Worker Equation Inputs for Soil

Variable	Value
TR (target cancer risk) unitless	0.00001
THQ (target hazard quotient) unitless	1
AT_w (averaging time)	365
EF_w (exposure frequency) d/yr	225
ED_w (exposure duration) yr	25
ET_w (exposure time) hr	8
LT (lifetime) yr	70
BW_w (body weight)	70
IR_w (soil ingestion rate) mg/day	100
SA_w (surface area) cm^2/day	3300
AF_w (skin adherence factor) mg/cm^2	0.2
City (Climate Zone) PEF Selection	Albuquerque, NM
A_s (acres) PEF Selection	0.5
Q/C_{wp} (g/m^2-s per kg/m^3) PEF Selection	81.84859
PEF (particulate emission factor) m^3/kg	6609630595
A (PEF Dispersion Constant)	14.9421
B (PEF Dispersion Constant)	17.9869
C (PEF Dispersion Constant)	205.1782
V (fraction of vegetative cover) unitless	0.5
U_m (mean annual wind speed) m/s	4.02
U_t (equivalent threshold value)	11.32
F(x) (function dependant on U_m/U_t) unitless	0.0553
City (Climate Zone) VF Selection	Default
A_s (acres) VF Selection	0.5
Q/C_{wp} (g/m^2-s per kg/m^3) VF Selection	68.18
foc (fraction organic carbon in soil) g/g	0.0015
ρ$_b$ (dry soil bulk density) g/cm^3	1.5
ρ$_s$ (soil particle density) g/cm^3	2.65
θ$_w$ (water-filled soil porosity) L_{water}/L_{soil}	0.26
T (exposure interval) s	950000000
A (VF Dispersion Constant)	11.911
B (VF Dispersion Constant)	18.4385
C (VF Dispersion Constant)	209.7845

Output generated 11DEC2012:13:09:40

Table H-3

Site-specific
Composite Worker Risk-Based Screening Levels (RSL) for Soil
ca=Cancer, nc=Noncancer, ca* (Where nc SL < 100 x ca SL),
ca** (Where nc SL < 10 x ca SL),
max=SL exceeds ceiling limit (see User's Guide), sat=SL exceeds csat

Chemical	CAS Number	Ingestion SF $(mg/kg\text{-}day)^{-1}$	SFO Ref	Inhalation Unit Risk $(ug/m^3)^{-1}$	IUR Ref	Chronic RfD (mg/kg-day)	RfD Ref	Chronic RfC (mg/m^3)	RfC Ref	GIABS	ABS	Volatilization Factor (m^3/kg)	Soil Saturation Concentration (mg/kg)
Thallium (Soluble Salts)	7440-28-0	-		-		1.00E-05	X	-		1	-	-	-

Output generated 11DEC2012:13:09:40

Table H-3

Particulate Emission Factor (m^3/kg)	Ingestion SL TR=1.0E-5 (mg/kg)	Dermal SL TR=1.0E-5 (mg/kg)	Inhalation SL TR=1.0E-5 (mg/kg)	Carcinogenic SL TR=1.0E-5 (mg/kg)	Ingestion SL HQ=1 (mg/kg)	Dermal SL HQ=1 (mg/kg)	Inhalation SL HQ=1 (mg/kg)	Noncarcinogenic SL HI=1 (mg/kg)	Screening Level (mg/kg)
6.61E+09	-	-	-	-	1.14E+01	-	-	1.14E+01	1.14E+01 nc

Table H-4

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	p001.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

THALLIUM (mg/kg)

General Statistics

Number of Valid Data	4	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	3
		Percent Non-Detects	75.00%

Warning: This data set only has 4 observations!

Data set is too small to compute reliable and meaningful statistics and estimates!

The data set for variable THALLIUM (mg/kg) was not processed!

It is suggested to collect at least 8 to 10 observations before using these statistical methods!

If possible, compute and collect Data Quality Objectives (DQO) based sample size and analytical results.

Table H-4

CAS	Total	Detects	FOD	Mindet	Maximum concentration of defects	minnd	maxnd	arithmean	arithsd	cvnorm	geomean	geostd	estmnln	eststdln	sw95	swnorm	swln
THALLIUM	4	1	25.00%		1.5	1.2	1.9	0.925	0.41332	0.446832	0.863416	1.520801	0.942726	0.413245	0.748	0.873	0.912

Table H-4

sf95	sfnorm	sfln	distribution	Median	95uclnorm	sdln	h	95uclln	95uclnp	95 quantnorm	95 quantln	95 quantnp	utl95norm	utl95ln	quant95np 1113	Units
			L*	1.6	1.411346	0.419237	3.267915	2.079253	1.5	1.604911	1.720794	1.5	3.051118	7.461052	1.5	mg/kg

Table H-4

cohenmnnorm	cohenstdnorm	cohenmnln	cohenstdln	aitchmnnorm	aithcstdnorm	aitchmnln	aitchstdln	poisspl	Pathway 4	BootStrapAMQ at 0.95% 1.3792265

Table H-4

CAS	Total	Detects	FOD	Mindet	Maximum concentration of defects	minnd	maxnd	arithmean	arithsd	cvnorm	geomean	geostd	estmnln	eststdln	sw95	swnorm	swln
THALLIUM	4	1	25.00%		1.5	1.2	1.9	0.925	0.41332	0.446832	0.863416	1.520801	0.942726	0.413245	0.748	0.873	0.912

Table H-4

sf95	sfnorm	sfln	distribution	Median	95uclnorm	sdln	h	95uclln	95uclnp	95 quantnorm	95 quantln	95 quantnp	utl95norm	utl95ln	quant95np1113	Units
			L*	1.6	1.411346	0.419237	3.267915	2.079253	1.5	1.604911	1.720794	1.5	3.051118	7.461052	1.5	mg/kg

Table H-4

cohenmnnorm	cohenstdnorm	cohenmnln	cohenstdln	aitchmnnorm	aithcstdnorm	aitchmnln	aitchstdln	poisspl	Pathway 4	BootStrapAMQ at 0.95% 1.3792265

Risk Additivity
Soil Analytical Data
Building 1221 (OT-C539) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC539-IS-0001-062912		OTC539-IS-0002-062912		OTC539-IS-0003-062912		OTC539-IS-0004-062912		OTC539-IS-0005-062912		OTC539-IS-0006-062912-FD		OTC539-IS-0007-062912		OTC539-IS-0008-062912		OTC539-IS-0009-062912	
				Sample Date	6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location	OT-C539-Station 1 influent line to tank		OT-C539-Station 1 influent line to tank		OT-C539-Station 2 septic tank		OT-C539-Station 2 septic tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 4 leach field		OT-C539-Station 4 leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		3 - 5		10 - 12		3 - 5		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**85.1**		**87.6**		**89.5**		**88**		**84**		**84.3**		**88.3**		**87.4**		**87.4**	
VOLATILES (mg/kg)																						
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0011	U	0.001	U	0.001	U	0.0012	U	0.0013	U	0.0011	U	0.001	U	0.0011	U	0.001	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.0014	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0017	U	0.0016	U	0.0016	U	0.0019	U	0.002	U	0.0016	U	0.0016	U	0.0017	U	0.0016	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0011	U	0.001	U	0.001	U	0.0012	U	0.0013	U	0.0011	U	0.001	U	0.0011	U	0.001	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0011	U	0.001	U	0.001	U	0.0012	U	0.0013	U	0.0011	U	0.001	U	0.0011	U	0.001	U
1,1-DICHLOROETHENE	NE	240	449		0.0014	U	0.0013	U	0.0013	U	0.0015	U	0.0017	U	0.0013	U	0.0013	U	0.0014	U	0.0013	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0012	UJ	0.0011	U	0.0011	U	0.0013	U	0.0014	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0023	U	0.0021	U	0.0021	U	0.0025	U	0.0028	U	0.0022	U	0.0021	U	0.0022	U	0.0022	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.00099	U	0.00093	U	0.00092	U	0.0011	U	0.0012	U	0.00096	U	0.00091	U	0.00097	U	0.00095	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0011	UJ	0.001	U	0.001	U	0.0012	U	0.0013	U	0.0011	U	0.001	U	0.0011	U	0.001	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.00099	U	0.00093	U	0.00092	U	0.0011	U	0.0012	U	0.00096	U	0.00091	U	0.00097	U	0.00095	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.0014	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0012	UJ	0.0011	U	0.0011	U	0.0013	U	0.0014	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0011	UJ	0.001	U	0.001	U	0.0012	U	0.0013	U	0.0011	U	0.001	U	0.0011	U	0.001	U
2-HEXANONE	NE	210	NE		0.0053	U	0.005	U	0.005	U	0.0059	U	0.0065	U	0.0052	U	0.0049	U	0.0052	U	0.0051	U
ACETONE	NE	61000	66600		0.02	U	0.019	U	0.018	U	0.022	U	0.024	U	0.019	U	0.018	U	0.019	U	0.019	U
BENZENE	NE	1.1	15.4		0.0015	U	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0011	U	0.001	U	0.001	U	0.0012	U	0.0013	U	0.0011	U	0.001	U	0.0011	U	0.001	U
BROMOFORM	NE	62	616		0.0015	U	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U
BROMOMETHANE	NE	7.3	16.5		0.002	U	0.0019	U	0.0018	U	0.0022	U	0.0024	U	0.0019	U	0.0018	U	0.0019	U	0.0019	U
CARBON DISULFIDE	NE	820	1530		0.002	U	0.0019	U	0.0018	U	0.0022	U	0.0024	U	0.0019	U	0.0018	U	0.0019	U	0.0019	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0018	U	0.0017	U	0.0017	U	0.002	U	0.0022	U	0.0017	U	0.0016	U	0.0017	U	0.0017	U
CHLOROBENZENE	NE	290	376		0.00099	U	0.00093	U	0.00092	U	0.0011	U	0.0012	U	0.00096	U	0.00091	U	0.00097	U	0.00095	U
CHLOROETHANE	NE	15000	29800		0.002	U	0.0019	U	0.0018	U	0.0022	U	0.0024	U	0.0019	U	0.0018	U	0.0019	U	0.0019	U
CHLOROFORM	NE	0.29	5.86		0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.0014	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U
CHLOROMETHANE	NE	120	275		0.002	U	0.0019	U	0.0018	U	0.0022	U	0.0024	U	0.0019	U	0.0018	U	0.0019	U	0.0019	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0015	U	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.00099	U	0.00093	U	0.00092	U	0.0011	U	0.0012	U	0.00096	U	0.00091	U	0.00097	U	0.00095	U
CYCLOHEXANE	NE	7000	NE		0.0014	UJ	0.0013	U	0.0013	U	0.0015	U	0.0017	U	0.0013	U	0.0013	U	0.0014	U	0.0013	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.00099	U	0.00093	U	0.00092	U	0.0011	U	0.0012	U	0.00096	U	0.00091	U	0.00097	U	0.00095	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0015	U	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U
ETHYLBENZENE	NE	5.4	68.4		0.00099	U	0.00093	U	0.00092	U	0.0011	U	0.0012	U	0.00096	U	0.00091	U	0.00097	U	0.00095	U
ISOPROPYLBENZENE	NE	2100	2430		0.0011	U	0.001	U	0.001	U	0.0012	U	0.0013	U	0.0011	U	0.001	U	0.0011	U	0.001	U
METHYL ACETATE	NE	78000	78200		0.012	U	0.012	U	0.012	U	0.014	U	0.015	U	0.012	U	0.011	U	0.012	U	0.012	U
METHYL ETHYL KETONE	NE	28000	37100		0.006	U	0.0057	U	0.0056	U	0.0067	U	0.0074	U	0.0059	U	0.0056	U	0.0059	U	0.0058	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0054	U	0.0051	U	0.0051	U	0.006	U	0.0066	U	0.0053	U	0.005	U	0.0053	U	0.0052	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0013	UJ	0.0012	U	0.0012	U	0.0014	U	0.0016	U	0.0012	U	0.0012	U	0.0013	U	0.0012	U
METHYLENE CHLORIDE	NE	56	409		0.0045	U	0.0043	U	0.0042	U	0.005	U	0.0055	U	0.0044	U	0.0042	U	0.0045	U	0.0044	U

Risk Additivity
Soil Analytical Data
Building 1221 (OT-C539) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC539-IS-0001-062912		OTC539-IS-0002-062912		OTC539-IS-0003-062912		OTC539-IS-0004-062912		OTC539-IS-0005-062912		OTC539-IS-0006-062912-FD		OTC539-IS-0007-062912		OTC539-IS-0008-062912		OTC539-IS-0009-062912	
				Sample Date		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location		OT-C539-Station 1 influent line to tank		OT-C539-Station 1 influent line to tank		OT-C539-Station 2 septic tank		OT-C539-Station 2 septic tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 4 leach field		OT-C539-Station 4 leach field	
				Depth (ft bgs)		3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		3 - 5		10 - 12		3 - 5		10 - 12	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																							
STYRENE	NE	6300	7280	0.0026	U	0.0024	U	0.0024	U	0.0029	U	0.0031	U	0.0025	U	0.0024	U	0.0025	U	0.0025	U		
TERT-BUTYL METHYL ETHER	NE	43	901	0.002	U	0.0019	U	0.0018	U	0.0022	U	0.0024	U	0.0019	U	0.0018	U	0.0019	U	0.0019	U		
TETRACHLOROETHYLENE	NE	22	7.02	0.00099	U	0.00093	U	0.00092	U	0.0011	U	0.0012	U	0.00096	U	0.00091	U	0.00097	U	0.00095	U		
TOLUENE	NE	5000	5270	0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.0014	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U		
TRANS-1,2-DICHLOROETHENE	NE	150	270	0.0015	U	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U		
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.0011	U	0.001	U	0.001	U	0.0012	U	0.0013	U	0.0011	U	0.001	U	0.0011	U	0.001	U		
TRICHLOROETHYLENE	NE	0.91	8.77	0.0012	U	0.0011	U	0.0011	U	0.0013	U	0.0014	U	0.0012	U	0.0011	U	0.0012	U	0.0011	U		
TRICHLOROFLUOROMETHANE	NE	790	1410	0.002	U	0.0019	U	0.0018	U	0.0022	U	0.0024	U	0.0019	U	0.0018	U	0.0019	U	0.0019	U		
VINYL CHLORIDE	NE	0.06	0.728	0.0015	U	0.0014	U	0.0014	U	0.0016	U	0.0018	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U		
XYLENES, TOTAL	NE	630	814	0.0032	UJ	0.003	U	0.003	U	0.0035	U	0.0039	U	0.0031	U	0.0029	U	0.0031	U	0.0031	U		
SEMIVOLATILES (mg/kg)																							
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U		
2,4,5-TRICHLOROPHENOL	NE	6100	6110	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U		
2,4,6-TRICHLOROPHENOL	NE	44	61.1	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U		
2,4-DICHLOROPHENOL	NE	180	183	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U		
2,4-DIMETHYLPHENOL	NE	1200	1220	0.026	U	0.024	U	0.023	U	0.024	U	0.025	U	0.025	U	0.024	U	0.024	U	0.024	U		
2,4-DINITROPHENOL	NE	120	122	0.41	U	0.38	U	0.37	U	0.38	U	0.4	U	0.4	U	0.38	U	0.38	U	0.38	U		
2,4-DINITROTOLUENE	NE	1.6	15.7	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U		
2,6-DINITROTOLUENE	NE	61	61.1	0.024	U	0.022	U	0.022	U	0.022	U	0.024	U	0.024	U	0.022	U	0.022	U	0.022	U		
2-CHLORONAPHTHALENE	NE	6300	6260	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U		
2-CHLOROPHENOL	NE	390	391	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U		
2-METHYLNAPHTHALENE	NE	230	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U		
2-METHYLPHENOL	NE	3100	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U		
2-NITROANILINE	NE	610	NE	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U		
2-NITROPHENOL	NE	NE	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U		
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U		
3-NITROANILINE	NE	NE	NE	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U		
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	0.083	U	0.076	U	0.074	U	0.076	U	0.08	U	0.08	U	0.076	U	0.076	U	0.075	U		
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U		
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U		
4-CHLOROANILINE	NE	2.4	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U		
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U		
4-NITROANILINE	NE	24	NE	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U		
4-NITROPHENOL	NE	NE	NE	0.17	U	0.15	U	0.15	U	0.15	U	0.16	U	0.16	U	0.15	U	0.15	U	0.15	U		
ACENAPHTHENE	NE	3400	3440	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U		
ACENAPHTHYLENE	NE	NE	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U		
ACETOPHENONE	NE	7800	7820	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U		
ANTHRACENE	NE	17000	17200	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U		
ATRAZINE	NE	2.1	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U		

Risk Additivity
Soil Analytical Data
Building 1221 (OT-C539) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC539-IS-0001-062912		OTC539-IS-0002-062912		OTC539-IS-0003-062912		OTC539-IS-0004-062912		OTC539-IS-0005-062912		OTC539-IS-0006-062912-FD		OTC539-IS-0007-062912		OTC539-IS-0008-062912		OTC539-IS-0009-062912	
				Sample Date	6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location	OT-C539-Station 1 influent line to tank		OT-C539-Station 1 influent line to tank		OT-C539-Station 2 septic tank		OT-C539-Station 2 septic tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 4 leach field		OT-C539-Station 4 leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		3 - 5		10 - 12		3 - 5		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																						
BENZALDEHYDE	NE	7800	NE	0.21	U	0.19	U	0.18	U	0.19	U	0.2	U	0.2	U	0.19	U	0.19	U	0.19	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
BENZO(A)PYRENE	NE	0.015	0.148	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U
BIPHENYL	NE	51	57.1	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.083	U	0.076	U	0.074	U	0.076	U	0.08	U	0.08	U	0.076	U	0.076	U	0.075	U
CAPROLACTAM	NE	31000	NE	0.066	U	0.061	U	0.059	U	0.061	U	0.064	U	0.064	U	0.061	U	0.061	U	0.06	U
CARBAZOLE	NE	NE	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
CHRYSENE	NE	15	148	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
DIBENZOFURAN	NE	78	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
DIETHYL PHTHALATE	NE	49000	48900	0.083	U	0.076	U	0.074	U	0.076	U	0.08	U	0.08	U	0.076	U	0.076	U	0.075	U
DIMETHYL PHTHALATE	NE	611000	611000	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.083	U	0.076	U	0.074	U	0.076	U	0.08	U	0.08	U	0.076	U	0.076	U	0.075	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U
FLUORANTHENE	NE	2300	2290	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
FLUORENE	NE	2300	2290	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.091	U	0.083	U	0.081	U	0.084	U	0.088	U	0.088	U	0.083	U	0.083	U	0.083	U
HEXACHLOROETHANE	NE	12	42.8	0.041	U	0.038	U	0.037	U	0.038	U	0.04	U	0.04	U	0.038	U	0.038	U	0.038	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
ISOPHORONE	NE	510	5120	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
M,P-CRESOL	NE	NE	NE	0.03	U	0.027	U	0.026	U	0.027	U	0.029	U	0.029	U	0.027	U	0.027	U	0.027	U
NAPHTHALENE	NE	3.6	43.0	0.033	U	0.03	U	0.029	U	0.031	U	0.032	U	0.032	U	0.03	U	0.03	U	0.03	U
NITROBENZENE	NE	4.8	53.5	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.25	U	0.23	U	0.22	U	0.23	U	0.24	U	0.24	U	0.23	U	0.23	U	0.23	U
PHENANTHRENE	NE	1830	1830	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
PHENOL	NE	18000	18300	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U
PYRENE	NE	1700	1720	0.021	U	0.019	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.019	U	0.019	U

Risk Additivity
Soil Analytical Data
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Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC539-IS-0001-062912		OTC539-IS-0002-062912		OTC539-IS-0003-062912		OTC539-IS-0004-062912		OTC539-IS-0005-062912		OTC539-IS-0006-062912-FD		OTC539-IS-0007-062912		OTC539-IS-0008-062912		OTC539-IS-0009-062912	
				Sample Date		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location		OT-C539-Station 1 influent line to tank		OT-C539-Station 1 influent line to tank		OT-C539-Station 2 septic tank		OT-C539-Station 2 septic tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 4 leach field		OT-C539-Station 4 leach field	
				Depth (ft bgs)		3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		3 - 5		10 - 12		3 - 5		10 - 12	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																							
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U		
1,3-DINITROBENZENE	NE	6.10	NE	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U		
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U		
2,4-DINITROTOLUENE	NE	1.60	15.7	0.09	U	0.085	U	0.096	U	0.09	U	0.094	U	0.092	U	0.087	U	0.077	U	0.095	U		
2,6-DINITROTOLUENE	NE	61.0	61.1	0.081	U	0.076	U	0.086	U	0.081	U	0.084	U	0.082	U	0.078	U	0.069	U	0.085	U		
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U		
2-NITROTOLUENE	NE	2.90	29.1	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U		
3-NITROTOLUENE	NE	6.10	7.82	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U		
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U		
4-NITROTOLUENE	NE	30.0	244.4	0.094	U	0.089	U	0.1	U	0.094	U	0.098	U	0.096	U	0.091	U	0.08	U	0.099	U		
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U		
NITROBENZENE	NE	4.80	53.5	0.086	U	0.082	U	0.092	U	0.087	U	0.09	U	0.088	U	0.084	U	0.074	U	0.091	U		
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U		
TETRYL	NE	240.0	244.0	0.074	U	0.07	U	0.079	U	0.074	U	0.077	U	0.076	U	0.072	U	0.063	U	0.078	U		
PCBS (mg/kg)																							
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0078	U	0.0075	U	0.0074	U	0.0076	U	0.0078	U	0.0079	U	0.0075	U	0.0076	U	0.0076	U		
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.0097	U	0.0094	U	0.0093	U	0.0094	U	0.0098	U	0.0098	U	0.0093	U	0.0095	U	0.0094	U		
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.0097	U	0.0094	U	0.0093	U	0.0094	U	0.0098	U	0.0098	U	0.0093	U	0.0095	U	0.0094	U		
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0078	U	0.0075	U	0.0074	U	0.0076	U	0.0078	U	0.0079	U	0.0075	U	0.0076	U	0.0076	U		
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0078	U	0.0075	U	0.0074	U	0.0076	U	0.0078	U	0.0079	U	0.0075	U	0.0076	U	0.0076	U		
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0078	U	0.0075	U	0.0074	U	0.0076	U	0.0078	U	0.0079	U	0.0075	U	0.0076	U	0.0076	U		
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0078	U	0.0075	U	0.0074	U	0.0076	U	0.0078	U	0.0079	U	0.0075	U	0.0076	U	0.0076	U		
METALS (mg/kg)																							
ALUMINUM	13722	77000	78000	2140	J	2120		2440		1810		2830		3730		2750		2340		2560			
ANTIMONY	1.6	31	31.3	1.2	UJ	0.88	U	1.4	U	0.92	U	0.86	U	1	U	0.86	U	1	U	1.7	U		
ARSENIC	3.7	0.39	3.90	1.3	J	0.88	U	0.71	U	0.92	U	0.91	J	1.4	J	0.86	U	1	U	0.87	U		
BARIUM	169.3	15000	15600	30	J	18.6	J	21.4	J	24.3	J	26.4	J	31.5	J	25.1	J	21.9	J	20.5	J		
BERYLLIUM	1.6	160	156	0.58	U	0.44	U	0.36	U	0.46	U	0.43	U	0.51	U	0.43	U	0.5	U	0.44	U		
CADMIUM	0.3	70	70.3	0.58	U	0.44	U	0.71	U	0.68	J	0.43	U	0.51	U	0.43	U	0.5	U	0.87	U		
CALCIUM	317332	NE	NE	246000		198000		182000		222000		210000		199000		214000		216000		205000			
CHROMIUM[d]	25	117000	117000	2	J	2	J	2.4	J	2.8	J	2.6	J	3.4	J	2.9	J	2.4	J	2.6	J		
COBALT	7.7	23	NE	1	J	0.57	J	0.85	J	0.7	J	1.1	J	1.4	J	0.85	J	0.84	J	0.71	J		
COPPER	13	3100	3130	1.4	J	0.95	J	1.4	J	1.9	J	1	J	1.4	J	5.1	J	1	U	0.96	J		
IRON	23049	55000	54800	2000		2110		2640		1850		2490		3200		2780		2360		2540			
LEAD	10.9	400	400	0.78	J	1.3	J	0.71	U	0.73	B	1.2	J	1.5	J	1.1	J	0.92	J	0.87	U		
MAGNESIUM	16991	NE	NE	2550	J	1310	J	1320	J	1550	J	2680		3400		1400	J	1600	J	1470	J		
MANGANESE	393	1800	1860	28.7	J	30.6		39		27		41.2		62.7		37.8		31.3		35.3			
MERCURY	0.0108	10	15.6	0.0095	U	0.0089	U	0.0085	U	0.009	U	0.009	U	0.0096	U	0.0088	U	0.0089	U	0.0088	U		
NICKEL	17.4	1500	1560	2.2	J	1.3	J	1.7	J	1.6	J	2.4	J	3	J	1.8	J	1.9	J	1.5	J		
POTASSIUM	5077	NE	NE	675	J	650	J	621	J	560	J	935	J	1180	J	716	J	727	J	784	J		

Risk Additivity
Soil Analytical Data
Building 1221 (OT-C539) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC539-IS-0001-062912		OTC539-IS-0002-062912		OTC539-IS-0003-062912		OTC539-IS-0004-062912		OTC539-IS-0005-062912		OTC539-IS-0006-062912-FD		OTC539-IS-0007-062912		OTC539-IS-0008-062912		OTC539-IS-0009-062912	
				Sample Date	6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012		6/29/2012	
				Location	OT-C539-Station 1 influent line to tank		OT-C539-Station 1 influent line to tank		OT-C539-Station 2 septic tank		OT-C539-Station 2 septic tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 3 effluent line from tank		OT-C539-Station 4 leach field		OT-C539-Station 4 leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		3 - 5		10 - 12		3 - 5		10 - 12	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
METALS (mg/kg)																						
SELENIUM	1.4	390	391		2.3	U	1.8	U	2.8	U	1.8	U	1.7	U	2	U	1.7	U	2	U	3.5	U
SILVER	1.1	390	391		0.58	U	0.44	U	0.36	U	0.46	U	0.43	U	0.51	U	0.43	U	0.5	U	0.44	U
SODIUM	5196	NE	NE		630	U	480	U	390	U	500	U	1420	J	1630	J	470	U	842	J	496	J
THALLIUM	1.3	0.78	0.782		1.5	J	1.1	U	1.9	U	1.2	U	1.1	U	1.3	U	1.1	U	1.3	U	2.3	U
VANADIUM	42.6	390	391		8.3	J	4.4	J	5.7	J	4.3	J	8.1	J	10.4	J	5.3	J	7.9	J	5.2	J
ZINC	54.6	23000	23500		5	J	5.2	J	4.8	J	5.2	J	6.6	J	8.8	J	82.6		5.4	J	4.8	J
PETROLEUM HYDROCARBONS (mg/kg)																						
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000		3.2	U	2.7	U	2.7	U	2.7	U	3.2	U	2.9	U	2.8	U	2.8	U	3.1	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000		3.9	U	3.8	U	3.7	U	5.28	J	3.9	U	3.9	U	3.7	U	3.8	U	3.8	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000		3.9	U	3.8	U	3.7	U	3.8	U	3.9	U	3.9	U	3.7	U	3.8	U	3.8	U
CYANIDE (mg/kg)																						
CYANIDE	NE	22.0	46.9		0.069	U	0.067	U	0.064	U	0.067	U	0.071	U	0.07	U	0.067	U	0.066	U	0.067	U
TRITIUM (pCi/g)																						
TRITIUM	NE	NE	NE		4.96	U	4.9	U	4.86	U	4.93	U	4.86	U	4.93	U	4.86	U	4.84	U	4.91	U

Risk Additivity
Soil Analytical Data
Building 1221 (OT-C539) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	Sample Date	Location	Depth (ft bgs)	Risk Additivity Evaluation at Building 1221 Holloman AFB				
								Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
PERCENT SOLIDS	NE	NE	NE									
VOLATILES (mg/kg)												
1,1,1-TRICHLOROETHANE	NE	8700	15600					1,1,1-TRICHLOROETHANE		ND		
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02					1,1,2,2-TETRACHLOROETHANE		ND		
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100					1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND		
1,1,2-TRICHLOROETHANE	NE	1.1	2.81					1,1,2-TRICHLOROETHANE		ND		
1,1-DICHLOROETHANE	NE	3.3	64.5					1,1-DICHLOROETHANE		ND		
1,1-DICHLOROETHENE	NE	240	449					1,1-DICHLOROETHENE		ND		
1,2,4-TRICHLOROBENZENE	NE	22	73.0					1,2,4-TRICHLOROBENZENE		ND		
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86					1,2-DIBROMO-3-CHLOROPROPANE		ND		
1,2-DIBROMOETHANE	NE	0.034	0.588					1,2-DIBROMOETHANE		ND		
1,2-DICHLOROBENZENE	NE	1900	2310					1,2-DICHLOROBENZENE		ND		
1,2-DICHLOROETHANE	NE	0.43	7.89					1,2-DICHLOROETHANE		ND		
1,2-DICHLOROPROPANE	NE	0.94	15.2					1,2-DICHLOROPROPANE		ND		
1,3-DICHLOROBENZENE	NE	NE	NE					1,3-DICHLOROBENZENE		ND		
1,4-DICHLOROBENZENE	NE	2.4	31.7					1,4-DICHLOROBENZENE		ND		
2-HEXANONE	NE	210	NE					2-HEXANONE		ND		
ACETONE	NE	61000	66600					ACETONE		ND		
BENZENE	NE	1.1	15.4					BENZENE		ND		
BROMODICHLOROMETHANE	NE	0.27	5.41					BROMODICHLOROMETHANE		ND		
BROMOFORM	NE	62	616					BROMOFORM		ND		
BROMOMETHANE	NE	7.3	16.5					BROMOMETHANE		ND		
CARBON DISULFIDE	NE	820	1530					CARBON DISULFIDE		ND		
CARBON TETRACHLORIDE	NE	0.61	10.8					CARBON TETRACHLORIDE		ND		
CHLOROBENZENE	NE	290	376					CHLOROBENZENE		ND		
CHLOROETHANE	NE	15000	29800					CHLOROETHANE		ND		
CHLOROFORM	NE	0.29	5.86					CHLOROFORM		ND		
CHLOROMETHANE	NE	120	275					CHLOROMETHANE		ND		
CIS-1,2-DICHLOROETHYLENE	NE	160	156					CIS-1,2-DICHLOROETHYLENE		ND		
CIS-1,3-DICHLOROPROPENE	NE	NE	NE					CIS-1,3-DICHLOROPROPENE		ND		
CYCLOHEXANE	NE	7000	NE					CYCLOHEXANE		ND		
DIBROMOCHLOROMETHANE	NE	0.68	12.1					DIBROMOCHLOROMETHANE		ND		
DICHLORODIFLUOROMETHANE	NE	94	168					DICHLORODIFLUOROMETHANE		ND		
ETHYLBENZENE	NE	5.4	68.4					ETHYLBENZENE		ND		
ISOPROPYLBENZENE	NE	2100	2430					ISOPROPYLBENZENE		ND		
METHYL ACETATE	NE	78000	78200					METHYL ACETATE		ND		
METHYL ETHYL KETONE	NE	28000	37100					METHYL ETHYL KETONE		ND		
METHYL ISOBUTYL KETONE	NE	5300	5820					METHYL ISOBUTYL KETONE		ND		
METHYLCYCLOHEXANE	NE	5630	5630					METHYLCYCLOHEXANE		ND		
METHYLENE CHLORIDE	NE	56	409					METHYLENE CHLORIDE		ND		

Risk Additivity
Soil Analytical Data
Building 1221 (OT-C539) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	Risk Additivity Evaluation at Building 1221 Holloman AFB				
			Sample Date					
			Location					
			Depth (ft bgs)					
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
VOLATILES - continued (mg/kg)								
STYRENE	NE	6300	7280	STYRENE		ND		
TERT-BUTYL METHYL ETHER	NE	43	901	TERT-BUTYL METHYL ETHER		ND		
TETRACHLOROETHYLENE	NE	22	7.02	TETRACHLOROETHYLENE		ND		
TOLUENE	NE	5000	5270	TOLUENE		ND		
TRANS-1,2-DICHLOROETHENE	NE	150	270	TRANS-1,2-DICHLOROETHENE		ND		
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	TRANS-1,3-DICHLOROPROPENE		ND		
TRICHLOROETHYLENE	NE	0.91	8.77	TRICHLOROETHYLENE		ND		
TRICHLOROFLUOROMETHANE	NE	790	1410	TRICHLOROFLUOROMETHANE		ND		
VINYL CHLORIDE	NE	0.06	0.728	VINYL CHLORIDE		ND		
XYLENES, TOTAL	NE	630	814	XYLENES, TOTAL		ND		
SEMIVOLATILES (mg/kg)								
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	2,2'-OXYBIS(1-CHLORO)PROPANE		ND		
2,4,5-TRICHLOROPHENOL	NE	6100	6110	2,4,5-TRICHLOROPHENOL		ND		
2,4,6-TRICHLOROPHENOL	NE	44	61.1	2,4,6-TRICHLOROPHENOL		ND		
2,4-DICHLOROPHENOL	NE	180	183	2,4-DICHLOROPHENOL		ND		
2,4-DIMETHYLPHENOL	NE	1200	1220	2,4-DIMETHYLPHENOL		ND		
2,4-DINITROPHENOL	NE	120	122	2,4-DINITROPHENOL		ND		
2,4-DINITROTOLUENE	NE	1.6	15.7	2,4-DINITROTOLUENE		ND		
2,6-DINITROTOLUENE	NE	61	61.1	2,6-DINITROTOLUENE		ND		
2-CHLORONAPHTHALENE	NE	6300	6260	2-CHLORONAPHTHALENE		ND		
2-CHLOROPHENOL	NE	390	391	2-CHLOROPHENOL		ND		
2-METHYLNAPHTHALENE	NE	230	NE	2-METHYLNAPHTHALENE		ND		
2-METHYLPHENOL	NE	3100	NE	2-METHYLPHENOL		ND		
2-NITROANILINE	NE	610	NE	2-NITROANILINE		ND		
2-NITROPHENOL	NE	NE	NE	2-NITROPHENOL		ND		
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	3,3'-DICHLOROBENZIDINE		ND		
3-NITROANILINE	NE	NE	NE	3-NITROANILINE		ND		
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	4,6-DINITRO-2-METHYLPHENOL		ND		
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	4-BROMOPHENYL PHENYL ETHER		ND		
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	4-CHLORO-3-METHYLPHENOL		ND		
4-CHLOROANILINE	NE	2.4	NE	4-CHLOROANILINE		ND		
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	4-CHLOROPHENYL PHENYL ETHER		ND		
4-NITROANILINE	NE	24	NE	4-NITROANILINE		ND		
4-NITROPHENOL	NE	NE	NE	4-NITROPHENOL		ND		
ACENAPHTHENE	NE	3400	3440	ACENAPHTHENE		ND		
ACENAPHTHYLENE	NE	NE	NE	ACENAPHTHYLENE		ND		
ACETOPHENONE	NE	7800	7820	ACETOPHENONE		ND		
ANTHRACENE	NE	17000	17200	ANTHRACENE		ND		
ATRAZINE	NE	2.1	NE	ATRAZINE		ND		

Risk Additivity
Soil Analytical Data
Building 1221 (OT-C539) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	Risk Additivity Evaluation at Building 1221 Holloman AFB				
			Sample Date					
			Location					
			Depth (ft bgs)					
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
SEMIVOLATILES - continued (mg/kg)								
BENZALDEHYDE	NE	7800	NE	BENZALDEHYDE		ND		
BENZO(A)ANTHRACENE	NE	0.15	1.48	BENZO(A)ANTHRACENE		ND		
BENZO(A)PYRENE	NE	0.015	0.148	BENZO(A)PYRENE		ND		
BENZO(B)FLUORANTHENE	NE	0.15	1.48	BENZO(B)FLUORANTHENE		ND		
BENZO(G,H,I)PERYLENE	NE	NE	NE	BENZO(G,H,I)PERYLENE		ND		
BENZO(K)FLUORANTHENE	NE	1.5	14.8	BENZO(K)FLUORANTHENE		ND		
BENZYL BUTYL PHTHALATE	NE	260	NE	BENZYL BUTYL PHTHALATE		ND		
BIPHENYL	NE	51	57.1	BIPHENYL		ND		
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	BIS(2-CHLOROETHOXY) METHANE		ND		
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	BIS(2-CHLOROETHYL) ETHER		ND		
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	BIS(2-ETHYLHEXYL) PHTHALATE		ND		
CAPROLACTAM	NE	31000	NE	CAPROLACTAM		ND		
CARBAZOLE	NE	NE	NE	CARBAZOLE		ND		
CHRYSENE	NE	15	148	CHRYSENE		ND		
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	DIBENZ(A,H)ANTHRACENE		ND		
DIBENZOFURAN	NE	78	NE	DIBENZOFURAN		ND		
DIETHYL PHTHALATE	NE	49000	48900	DIETHYL PHTHALATE		ND		
DIMETHYL PHTHALATE	NE	611000	611000	DIMETHYL PHTHALATE		ND		
DI-N-BUTYL PHTHALATE	NE	6100	6110	DI-N-BUTYL PHTHALATE		ND		
DI-N-OCTYLPHTHALATE	NE	730	NE	DI-N-OCTYLPHTHALATE		ND		
FLUORANTHENE	NE	2300	2290	FLUORANTHENE		ND		
FLUORENE	NE	2300	2290	FLUORENE		ND		
HEXACHLOROBENZENE	NE	0.3	3.04	HEXACHLOROBENZENE		ND		
HEXACHLOROBUTADIENE	NE	6.2	61.1	HEXACHLOROBUTADIENE		ND		
HEXACHLOROCYCLOPENTADIENE	NE	370	367	HEXACHLOROCYCLOPENTADIENE		ND		
HEXACHLOROETHANE	NE	12	42.8	HEXACHLOROETHANE		ND		
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	INDENO(1,2,3-C,D)PYRENE		ND		
ISOPHORONE	NE	510	5120	ISOPHORONE		ND		
M,P-CRESOL	NE	NE	NE	M,P-CRESOL		ND		
NAPHTHALENE	NE	3.6	43.0	NAPHTHALENE		ND		
NITROBENZENE	NE	4.8	53.5	NITROBENZENE		ND		
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	N-NITROSODI-N-PROPYLAMINE		ND		
N-NITROSODIPHENYLAMINE	NE	99	993	N-NITROSODIPHENYLAMINE		ND		
PENTACHLOROPHENOL	NE	0.89	8.94	PENTACHLOROPHENOL		ND		
PHENANTHRENE	NE	1830	1830	PHENANTHRENE		ND		
PHENOL	NE	18000	18300	PHENOL		ND		
PYRENE	NE	1700	1720	PYRENE		ND		

Risk Additivity
Soil Analytical Data
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Holloman Air Force Base, New Mexico

Analyte			Sample Number	Risk Additivity Evaluation at Building 1221 Holloman AFB				
			Sample Date					
			Location					
			Depth (ft bgs)					
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
EXPLOSIVES (mg/kg)								
1,3,5-TRINITROBENZENE	NE	2200.0	NE	1,3,5-TRINITROBENZENE		ND		
1,3-DINITROBENZENE	NE	6.10	NE	1,3-DINITROBENZENE		ND		
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	2,4,6-TRINITROTOLUENE		ND		
2,4-DINITROTOLUENE	NE	1.60	15.7	2,4-DINITROTOLUENE		ND		
2,6-DINITROTOLUENE	NE	61.0	61.1	2,6-DINITROTOLUENE		ND		
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	2-AMINO-4,6-DINITROTOLUENE		ND		
2-NITROTOLUENE	NE	2.90	29.1	2-NITROTOLUENE		ND		
3-NITROTOLUENE	NE	6.10	7.82	3-NITROTOLUENE		ND		
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	4-AMINO-2,6-DINITROTOLUENE		ND		
4-NITROTOLUENE	NE	30.0	244.4	4-NITROTOLUENE		ND		
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE		ND		
NITROBENZENE	NE	4.80	53.5	NITROBENZENE		ND		
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE		ND		
TETRYL	NE	240.0	244.0	TETRYL		ND		
PCBS (mg/kg)								
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	PCB-1016 (AROCLOR 1016)		ND		
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	PCB-1221 (AROCLOR 1221)		ND		
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	PCB-1232 (AROCLOR 1232)		ND		
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	PCB-1242 (AROCLOR 1242)		ND		
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	PCB-1248 (AROCLOR 1248)		ND		
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	PCB-1254 (AROCLOR 1254)		ND		
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	PCB-1260 (AROCLOR 1260)		ND		
METALS (mg/kg)								
ALUMINUM	13722	77000	78000	ALUMINUM		3730		0.05
ANTIMONY	1.6	31	31.3	ANTIMONY		ND		
ARSENIC	3.7	0.39	3.90	ARSENIC	C	1.4	3.6E-06	
BARIUM	169.3	15000	15600	BARIUM		31.5		0.0020
BERYLLIUM	1.6	160	156	BERYLLIUM		ND		
CADMIUM	0.3	70	70.3	CADMIUM		ND		
CALCIUM	317332	NE	NE	CALCIUM		246000		nutrient
CHROMIUM[d]	25	117000	117000	CHROMIUMd		3.4		0.000029
COBALT	7.7	23	NE	COBALT		1.4		0.061 RSL
COPPER	13	3100	3130	COPPER		1.4		0.00045
IRON	23049	55000	54800	IRON		3200		0.058
LEAD	10.9	400	400	LEAD		1.5		0.0038
MAGNESIUM	16991	NE	NE	MAGNESIUM		3400		nutrient
MANGANESE	393	1800	1860	MANGANESE		62.7		0.034
MERCURY	0.0108	10	15.6	MERCURY		ND		
NICKEL	17.4	1500	1560	NICKEL		3		0.0019
POTASSIUM	5077	NE	NE	POTASSIUM		1180		nutrient

Risk Additivity
Soil Analytical Data
Building 1221 (OT-C539) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	Risk Additivity Evaluation at Building 1221 Holloman AFB				
			Sample Date					
			Location					
			Depth (ft bgs)					
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
METALS (mg/kg)								
SELENIUM	1.4	390	391	SELENIUM		ND		
SILVER	1.1	390	391	SILVER		ND		
SODIUM	5196	NE	NE	SODIUM		1630		nutrient
THALLIUM	1.3	0.78	0.782	THALLIUM		1.5		1.92
VANADIUM	42.6	390	391	VANADIUM		10.4		0.027
ZINC	54.6	23000	23500	ZINC		8.8		0.00037
PETROLEUM HYDROCARBONS (mg/kg)								
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	GASOLINE RANGE ORGANICS C6-C10		ND		
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	DIESEL RANGE ORGANICS C10-C28		ND		
OIL RANGE ORGANICS C28-C40	NE	NE	1000	OIL RANGE ORGANICS C28-C40		ND		
CYANIDE (mg/kg)								
CYANIDE	NE	22.0	46.9	CYANIDE		ND		
TRITIUM (pCi/g)								
TRITIUM	NE	NE	NE	TRITIUM		ND		
					SUM:		**3.6E-06**	**2.2E+00**

Risk Additivity
Soil Analytical Data
Building 1221 (OT-C539) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Final

RCRA Facility Investigation Report
Group 1 – Building 1251 (OT-C540)
Holloman Air Force Base, New Mexico

Prepared for U.S. Air Force Civil Engineer Center
2261 Hughes Ave., Suite 155
Lackland Air Force Base, Texas 78236-9861

Prepared by Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

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Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)

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Acronyms and Abbreviations

AFB	Air Force Base
bgs	below ground surface
COPC	chemical of potential concern
DPT	direct push technology
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
ft	foot/feet
GPR	ground-penetrating radar
GRO	gasoline range organics
HI	hazard index
IDW	investigation-derived waste
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MDL	method detection limit
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
ORO	oil range organics
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RSL	Regional Screening Level
Shaw	Shaw Environmental & Infrastructure, Inc. (a CB&I Company)
SLERA	screening-level ecological risk assessment
SSL	soil screening level
SVOC	semivolatile organic compound
TAL	target analyte list
TDS	total dissolved solids
TPH	total petroleum hydrocarbons
VOC	volatile organic compound
WQS	water quality standards

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1.0 INTRODUCTION

Shaw Environmental & Infrastructure, Inc. (Shaw), a CB&I company, has prepared this Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for the Air Force Civil Engineer Center (formerly the Air Force Center for Engineering and the Environment) under Contract No. FA8903-09-D-8580, Task Order No. 0013, Modification 01. Results presented in this report are from the investigation of the abandoned septic tank located at Building 1251 (OT-C540) at Holloman Air Force Base (AFB), New Mexico, which was one of the fifteen Group 1 septic tank sites under the Midwestern Region Performance-Based Remediation Contract. This RFI Report has been prepared pursuant to the requirements of the Holloman AFB Hazardous Waste Facility RCRA Permit No. NM6572124422 (the Permit) (New Mexico Environment Department [NMED], 2004). The purpose of this RFI was to delineate potential contamination that may have been released to the environment from the Building 1251 septic tank system.

Holloman AFB is situated in south-central New Mexico in the northwest central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). The 15 Group 1 former septic tank sites are located throughout Holloman AFB (Figure 1-2). Each former septic tank is associated with a specific building and is named in reference to the building, along with a numerical identification. As such, the 15 Group 1 septic tank systems are the following: OT-C530 (Building 308), OT-C531 (Buildings 920, 921, and 922), OT-C532 (Building 924), OT-C533 (Building 1190), OT-C534 (Building 1194), OT-C535 (Building 1196), OT-C536 (Building 1199), OT-C537 (Building 1200), OT-C538 (Building 1201), OT-C539 (Building 1221), OT-C540 (Building 1251), OT-C541 (Building 1269), OT-C542 (Building 1166), OT-C543 (Building 1175), and OT-C544 (Building 1176). This report presents a summary of the RFI work conducted at inactive septic tank OT-C533 at Building 1190.

Building 1251 was constructed in 1965 and is listed in Holloman AFB records as a Research and Testing Shop. The building has been vacant since the mid-1990s. The *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) report in Appendix A indicates that the building contained a toilet and lavatory. The septic tank was abandoned in place in January 2008 by opening the tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill (North Wind, Inc., 2008, also included in Appendix A).

1.1 Purpose of the Investigation

Investigative activities were undertaken at Holloman AFB to determine the nature and extent of contamination and propose recommendations for either closure or additional corrective action, if necessary, at 15 inactive, abandoned, or removed septic tank systems, following the

general guidance for closing septic systems found in 20.7.3.307 New Mexico Administrative Code (NMAC) Standards – Abandoned Sewers and On-Site Liquid Waste Systems.

Project quality objectives for each septic tank site consisted of the following:

- Gather and review all site historical information
- Identify septic tank components and historical uses
- Remove septic tank contents and contaminated soil (where necessary), and abandon the tank (where necessary)
- Determine the nature and extent of residual constituents of concern at each site, including potential pathways to groundwater
- Evaluate the risk at each site
- Develop conclusions and recommendations for each site.

This RFI Report presents the data collected to meet these project quality objectives at the Building 1251 abandoned septic tank.

1.2 Scope of Activities

This RFI Report describes all activities associated with the septic tank investigation at Building 1251, including site layout, soil sampling, soil analysis, as-built pipe mapping, and site boundary survey. All work was performed in accordance with the *Basewide Septic Tank Solid Waste Management Units RFI Work Plan* (U.S. Army Corps of Engineers [USACE], 2010) and the *Quality Program Plan* (Shaw, 2012a). The *Quality Program Plan* (Shaw, 2012a) contains the Site Safety and Health Plan; the Uniform Federal Policy–Sampling and Analysis Plan/Quality Assurance Project Plan; and the Construction Quality Plan, which defines the methodology and practices used to control construction work during the performance of the RFI.

1.3 Regulatory Setting

The Permit (NMED, 2004) established the general and specific standards and activities for managing hazardous waste pursuant to Subtitle C of RCRA, the New Mexico Hazardous Waste Act, and the New Mexico Hazardous Waste Management Regulations. The Permit also set forth requirements for investigation, notification, corrective action, and reporting for the storage, management, and releases of hazardous wastes.

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The 15 septic systems were either inactive, abandoned, or previously removed as indicated in *Holloman Air Force Base Septic Tanks* report (Appendix A), and were not listed in the Permit (NMED, 2004). The Holloman AFB *RFI Work Plan* (USACE, 2010) was approved by NMED in a letter dated January 13, 2010 (NMED, 2010). The NMED-approved *RFI Work Plan* (USACE, 2010) contained investigation activities only; therefore, Shaw submitted a *Voluntary Corrective Measures Request - Septic Tanks Sites* (Shaw, 2012b) to include remediation and closure tasks that addressed septic system abandonment using 20.7.3.307 NMAC (Abandoned Sewers and On-Site Liquid Waste Systems). NMED has primary regulatory responsibility for the septic system sites; therefore, corrective action must be performed under Title 20 NMAC.

The septic tank investigations were based on action/cleanup levels stipulated in Appendix 4-F of the Permit to be protective of human health and the environment. Permit Appendix 4-F specifies that soil contaminant concentrations be compared with the NMED residential soil screening levels (SSL), as presented in the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a), or the U.S. Environmental Protection Agency (EPA) Regional Screening Levels (RSL) as presented in the *U.S. Environmental Protection Agency (EPA) Regions 3, 6, and 9 Regional Screening Levels for Chemical Contaminants at Superfund Sites* (EPA, 2012a), if no NMED SSL has been established (EPA, 2012a). Holloman AFB also has NMED-approved background concentrations for metals in soil (NMED, 2012b).

Regarding groundwater, the Permit specifies that the more stringent of either the New Mexico Water Quality Control Commission (NMWQCC) water quality standards (20.6.2 NMAC), or the EPA drinking water maximum contaminant levels, be used for comparison with measured sample concentrations (EPA, 2012b).

1.4 RFI Report Organization

This RFI Report is organized into the following sections:

- **Section 1.0, Introduction**: identifies the objectives and purpose of this report.
- **Section 2.0, Environmental Setting**: provides pertinent descriptions of history, location, physiography, topography, surface water, hydrology, regional geology, soil types, regional hydrogeology, climate, current and future land use, and current and future water use for Holloman AFB.
- **Section 3.0, Source Characterization**: describes the data collection techniques and locations, as well as analytical methods.

- **Section 4.0, Investigation Results and Evaluation**: presents the soil analytical results, and provides the results of the human health risk and ecological evaluations.
- **Section 5.0, Data Quality Assurance and Data Quality Control Review**: summarizes the analytical data validation results.
- **Section 6.0, Conclusions and Recommendations**: presents the conclusions and recommendations of this RFI report.
- **Section 7.0, References**: lists the references cited in this report.

In addition to the figures and tables listed in the table of contents, the following appendices are included in this report:

- **Appendix A** – Historical Records
- **Appendix B** – Geophysical Report
- **Appendix C** – Sample Collection Logs
- **Appendix D** – Boring Logs
- **Appendix E** – Site Survey Data
- **Appendix F** – Laboratory Analytical Data and Data Validation Checklists
- **Appendix G**– Waste Manifests
- **Appendix H** – Risk Evaluation Calculations
- **Appendix I** – Ecological Evaluation.

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2.0 ENVIRONMENTAL SETTING

This section provides background information for Holloman AFB including physical setting, history, topography, climate, soils, geology, hydrology, and land and water use.

2.1 Physical Setting

Holloman AFB is situated in south-central New Mexico, in the northwest-central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). Holloman AFB has a population of 6,000, and occupies 59,639 acres in the northeast quarter of Section 1, Township 17 South, Range 8 East. The White Sands Missile Range testing facilities occupy additional land extending northward from the base. Privately- and publicly-owned lands border the remainder of Holloman AFB. The major highway servicing Holloman AFB is Highway 70, which runs southwest from the town of Alamogordo, New Mexico, and separates Holloman AFB from publicly owned lands to the south. Alamogordo, New Mexico, which has a population of 30,401 according to the 2010 U.S. Census, is located approximately 7 miles east of the base.

2.2 Holloman Air Force Base History

Holloman AFB was first established in 1942 as Alamogordo Army Air Field. From 1942 through 1945, Alamogordo Army Air Field served as the training grounds for over 20 different flight groups, flying primarily B-17s, B-24s, and B-29s. After World War II, most operations had ceased at the base. In 1947, Air Material Command announced the air field would be its primary site for the testing and development of unmanned aircraft, guided missiles, and other research programs. On January 13, 1948, the Alamogordo installation was renamed in honor of the late Colonel George V. Holloman, a pioneer in guided missile research. In 1968, the 49th Tactical Fighter Wing arrived at Holloman AFB, and has remained since. Today, Holloman AFB also serves as the training center for the German Air Force's Tactical Training Center.

2.3 Physiography and Topography

Holloman AFB is located within the Sacramento Mountains physiographic province on the western edge of the Sacramento Mountains. The base is approximately 59,600 acres in area, and is located at a mean elevation of 4,093 feet (ft) above mean sea level. The region is characterized by high tablelands with rolling summit plains; cuesta-formed mountains dipping eastward; and west-facing escarpments, with the wide bracketed basin forming the basin and range complex. Holloman AFB is located in the Tularosa Basin, which is part of the Central Closed Basins. The bordering mountains rise abruptly to altitudes of 7,000 to 12,000 ft above mean sea level. The San Andres Mountains bound the basin to the west

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(approximately 30 miles) with the Sacramento Mountains approximately 10 miles to the east (Figure 2-1). At its widest, the basin is approximately 60 miles east to west, and stretches approximately 150 miles north to south.

2.4 Climate

As a whole, New Mexico has a mild, arid to semiarid continental climate characterized by light precipitation totals, abundant sunshine, relatively low humidity, and relatively large annual and diurnal temperature ranges (Western Regional Climate Center, 2013). The climate of the Central Closed Basins varies with elevation. The base is located in the low areas and is characterized by warm temperatures and dry air. Daytime temperatures often exceed 100 degrees Fahrenheit in the summer months and are in the middle 50s degrees Fahrenheit in the winter. A preponderance of clear skies and relatively low humidity permits rapid nighttime cooling resulting in average diurnal temperature ranges of 25 to 35 degrees Fahrenheit. Potential evapotranspiration, at 67 inches per year, significantly exceeds annual precipitation, usually less than 15 inches. Arid conditions resulting from very low rainfall amounts, coupled with the topographically induced wind patterns combining with the sparse vegetation, tend to cause localized “dust devils.” The annual rainfall for Alamogordo, New Mexico is 12 inches per year. Much of the precipitation falls during the midsummer monsoonal period (July and August) as brief, yet frequent, intense thunderstorms culminating in 30 to 40 percent of the total annual rainfall.

2.5 Regional Geology and Soils

2.5.1 Geology

The sedimentary rocks that make up the adjacent mountain ranges are between 250 and 500 million years old (New Mexico Bureau of Geology and Mineral Resources, 2012). During the period when the area was submerged beneath the shallow intracontinental sea, the layers of limestone, shale, gypsum, and sandstone were formed. In time, these layers were pushed upward through various tectonic forces forming a large bulge on the surface. Approximately 10 million years ago, the center began to subside resulting in a vertical drop of thousands of feet, leaving the edges still standing (the present-day Sacramento and San Andres mountain ranges). In the millions of years following, rainfall, snowmelt, and wind eroded the mountain sediments depositing them in the valley (i.e., Tularosa Basin). Water carrying eroded limestone, dolomite, gravel, and other materials continue to flow into the basin.

As the Tularosa Basin is a bolson, which is a basin with no surface drainage outlet, sediments carried by surface water into a closed basin are bolson deposits. The overlying alluvium generally consists of unconsolidated gravels, sands, and clays. Soils in the basin are derived from the adjacent ranges as erosional deposits of limestone, dolomite, and gypsum. A fining

sequence from the ranges towards the basin's center characterizes the area with the near-surface soils as alluvial, eolian, and lacustrine deposits. The alluvial fan deposits are laterally discontinuous units of interbedded sand, silt, and clay while the eolian deposits consist primarily of gypsum sands. The eolian and alluvial deposits are usually indistinguishable due to the reworking of the alluvial sediment by eolian processes. The playa, or lacustrine deposits, consist of clay containing gypsum and are contiguous with the alluvial fan and eolian deposits throughout the base. Stiff caliche layers, varying in thickness, have been identified at different areas of the base.

2.5.2 Soils

The U.S. Natural Resources Conservation Service (formerly the Soil Conservation Service) has identified two soil associations in the vicinity of Holloman AFB: (1) the Holloman-Gypsum Land-Yesum Complex, and (2) the Mead silty clay loam (Figure 2-2) (U.S. Department of Agriculture, 1981). The permeability of these horizons ranges from 4×10^{-4} to 1×10^{-3} centimeters per second.

The Holloman-Gypsum Land-Yesum Complex, 0 to 5 percent sloped soil, consists of larger areas of shallow and deep, well-drained soils and areas of exposed gypsum. The Holloman soil makes up approximately 35 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 13 inches of the substratum is pink, very fine sandy loam that is very high in gypsum. Below that, the substratum is white gypsum to a depth of more than 60 inches. This soil is calcareous and mildly alkaline to moderately alkaline. Permeability is moderate. Available water capacity is very low.

Gypsum Land makes up approximately 30 percent of the Holloman-Gypsum Land-Yesum Complex (0 to 5 percent slopes). Typically, less than 1 inch of very fine sandy loam overlies soft to hard, white gypsum. The deep Yesum consists of very fine sandy loam that makes up approximately 20 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 9 inches of the substratum is light brown, fine sandy loam that is very high in gypsum. Below that, the substratum is pink, very fine sandy loam to a depth of more than 60 inches. The soil is calcareous throughout, and is mildly alkaline. Permeability is moderate. Available water capacity is moderate. Many fine gypsum crystals are found throughout the profile.

The soil type found across the main drainage area for the installation is Mead silty clay loam, 0 to 1 percent slopes. This deep, poorly drained, nearly level soil is on outer fringes of alluvial fans. This soil formed in fine textured alluvium over lacustrine lake sediment. It is very high in salt content because of periodic flooding and poor drainage. Slopes are smooth and concave. Typically, the surface layer is reddish brown, silty clay loam, and clay loam

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approximately 5 inches thick. The substratum, to a depth of 48 inches, is light reddish brown clay that has a high content of salt. Below that, the substratum is lacustrine material of variable texture and color to a depth of more than 60 inches. Included within this soil are areas of Holloman soils and Gypsum Land along the margins of the unit of steep, short gully sides and knolls. These inclusions make up approximately 15 percent of the map unit for this soil type. Individual areas are generally smaller than 10 acres. This soil is moderately calcareous throughout and is moderately to strongly alkaline. It has a layer of salt that is more soluble than gypsum. Permeability is very low. Available water capacity is low (USACE, 2010).

2.6 Regional Hydrogeology

Groundwater occurs as an unconfined aquifer in the unconsolidated deposits of the central basin, with the primary source of recharge as rainfall percolation and minor amounts of stream runoff along the western edge of the Sacramento Mountains. Surface water/rainfall migrates downward into the alluvial sediments at the edge of the shallow aquifer near the ranges and flows through progressively finer-grained sediments towards the central basin. Because the Tularosa Basin is a closed system, water that enters the area leaves either through evaporation or percolation. This elevated amount of percolation results in a fairly high water table. Beneath Holloman AFB, groundwater ranges from 5 to 50 ft below ground surface (bgs). Flow for the base is generally towards the southwest with localized influences from the variations in the topography of the base (Figure 2-3). In the northern and western portions of the base, groundwater flows more to the west towards the Ritas Draw, Malone Draw, and Lost River drainages. Groundwater flow is affected by local topography in areas immediately adjacent to arroyos, where groundwater flows directly toward the drainages regardless of the regional flow pattern.

Groundwater in the Tularosa Basin is of potable quality at the recharge areas in close proximity to the Sacramento Mountains and becomes increasingly mineralized toward the central portion of the basin and discharge areas. The majority (over 70 percent) of the Environmental Restoration Program sites located across Holloman AFB have groundwater monitoring wells containing water with an average total dissolved solids (TDS) concentration greater than 10,000 milligrams per liter (mg/L). These TDS data support the hypothesis that TDS concentrations below 10,000 mg/L at Holloman AFB are caused by dilution of natural groundwater quality from leaking water lines and surface irrigation from the domestic water supply. TDS concentrations greater than 10,000 mg/L exceed the NMWQCC limit as potable water (20.6.2 NMAC), and thus, the groundwater beneath Holloman AFB has been designated as unfit for human consumption. Likewise, the EPA guidelines have identified the groundwater as a Class IIIB water source, characterized by TDS concentrations exceeding 10,000 mg/L, and is characterized by a low degree of

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interconnection with adjacent surface water or groundwater of a higher class. Groundwater does not discharge or connect to any adjacent aquifers, because the Tularosa Basin is a closed basin. Adjacent surface waters include Lost River and Lake Holloman, which also have high concentrations of TDS, and are not considered potential drinking water sources.

2.7 Surface Water and Hydrology

The Tularosa Basin contains all of the surface flow in its boundaries. The nearest inflow of surface waters to Holloman AFB comes from the Lost River, located in the north-central region of the base. The upper reaches of the Three Rivers and the Sacramento River are perennial in the basin. Holloman AFB is dissected by several southwest-trending arroyos that control the surface drainage. Hay Draw arroyo is located in the far north. Malone and Ritas Draws, which drain into the Lost River and Dillard Draw arroyos, are located along the eastern perimeter of the base. Approximately 10,000 years ago, indications are that a much wetter climate existed. The present-day Lake Otero encompassed a much larger area, possibly upwards of several hundred square miles. Its remains are the Alkali Flat and Lake Lucero. Lake Lucero is a temporary feature of merely a few inches in depth during the rainy season.

Ancient lakes and streams deposited water-bearing deposits over the older bedrock basement materials. Fractures, cracks, and fissures in the Permian and Pennsylvanian bedrock yield small quantities of relatively good-quality water in the deeper peripheral. Potable water is only found from wells near the edges of the basin, with more saline water towards the center. Two of the principal sources of potable water are: (1) a long narrow area on the upslope sides of Tularosa and Alamogordo, and (2) in the far southwestern part of the basin. A portion of the city of Alamogordo's water, as well as Holloman AFB's water, is supplied from Bonito Lake (which is in the Pecos River Basin).

2.8 Current and Future Land Use

The land surrounding Holloman AFB consists of residential areas to the east and northeast (city of Alamogordo), rangeland to the south, the White Sands National Monument to the west, and areas where military activities are conducted to the north. The desert terrain of the area immediately surrounding Holloman AFB has limited development, and there are no agricultural operations, residential communities, or large industrial operations located adjacent to the base. The Boles Well Field, a freshwater source for Holloman AFB, is located approximately 6 miles to the southeast of the base. Holloman AFB is an active military installation and is expected to remain active for the foreseeable future. No transfer of military property to the public is anticipated, and public access to the base is restricted. Future land use is not expected to differ significantly from current land use practices (Foster Wheeler Environmental Corporation, 2002).

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2.9 Current and Future Water Use

At present, Holloman AFB receives approximately 50 percent of its freshwater supply from the Boles Well Field. An additional freshwater resource for Holloman AFB, and for the city of Alamogordo, is Bonito Lake, located 60 miles northeast of the Tularosa Basin. Currently, there are no potable supplies of groundwater or surface water located on the base because of poor groundwater quality with TDS concentrations greater than 10,000 mg/L.

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3.0 SOURCE CHARACTERIZATION

This section presents the overall technical approach in general accordance with the *RFI Work Plan* (USACE, 2010) (except where otherwise noted), and details the investigative and remediation activities that were implemented at Building 1251.

The primary environmental media of concern at Building 1251 are soil and groundwater. The extent of contamination in soil was expected to be relatively local to the abandoned septic tank location. Therefore, the basic approach was to identify the abandoned septic tank location and then work outward from the location in identifying contaminated soil. To evaluate the potential impacts to groundwater, a monitoring well was planned for installation in the leach field of each inactive, abandoned, or removed septic tank. The analytical programs for both soil and groundwater focused on the expected nature of contamination likely to be associated with septic tank discharges.

The RFI conducted at abandoned septic tank OT-C540 (Building 1251) was initiated as part of the Midwestern Region Performance-Based Remediation Contract. The *RFI Work Plan* (USACE, 2010) for this site included the following field work activities: pre-mobilization and mobilization/site setup activities, soil boring advancement, soil sample collection, soil sample analysis, investigation-derived waste (IDW) management, and land surveying. Photographs documenting field activities at Building 1251 are not available.

3.1 Pre-mobilization/Mobilization Activities

Several pre-investigation documents were filed and approvals obtained, as follows:

- Civil Engineer Work Request (Air Force Form 332) approval
- Base digging permits (Air Force Form 103, Base Civil Engineering Work Clearance Request) with utility clearances
- Site security clearances
- Facility manager notification of the intended operations.

Prior to the start of activities, a pre-investigation kick-off meeting and site walk-through were conducted with the Air Force Civil Engineer Center resident engineer, Holloman AFB personnel, and Shaw's Construction Manager, to plan for equipment access, equipment staging, decontamination area layout, potential site hazards, emergency evacuation routes, and project schedule.

Prior to the submittal of the base digging permits, the drilling locations were delineated using marker flags, stakes, and paint. Utility clearance approvals were completed by the

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appropriate Holloman AFB utility office (i.e., telephone, sewer, water, natural gas, etc.), and by the New Mexico One Call utility clearance system. Upon receipt of the approved digging permit and utility clearances, Shaw's Construction Manager completed a site walk-through to confirm the utility and intrusive work locations. In addition, Shaw performed a site survey prior to the start of drilling activities to search for signs of other buried or overhead utilities.

3.2 Geophysical Investigation

A geophysical investigation was performed at Building 1251 in an attempt to define the limits of the abandoned septic system. Methods employed included: visual inspection, electromagnetic induction conductivity detection, ground-penetrating radar (GPR), and electromagnetic pipe and cable location.

Electromagnetic induction conductivity detection ground induction methods are employed to detect broad metal mass anomalies or conductive zones that may be indicative of potential septic tanks, and lateral changes in conductive zones of soil or backfill materials relative to native soil. GPR is used to detect abandoned septic tank excavation sidewalls and fill areas. An electromagnetic pipe and cable survey was conducted to detect buried utility lines.

Electromagnetic and GPR surveys were conducted at Building 1251 in June 2012. Influent piping and the location of the abandoned septic tank were identified The location of the abandoned septic tank and leach field were identified approximately 75 ft south of Building 1251. The locations of the individual leach field piping could not be directly detected by the geophysical survey due to the similarity of composition of the clay pipes and the surrounding soil. However, the leach field could be identified by the geophysical survey equipment due to the differences in mineralization and conductivity between the native soil and the soils that were physically affected by normal leach field operation. The presence of the leach field piping was assumed within the leach field as identified by the geophysical survey which allowed for representative soil and groundwater sample collection. One buried utility line was identified east of the building, away from the investigation area. Geophysical findings are shown on Figure 3-1. The complete geophysical report is included in Appendix B.

3.3 Soil Investigation

The soil investigation of the abandoned septic tank at Building 1251 was conducted on June 20 and 21, 2012. The program consisted of sampling four borings advanced at the abandoned septic tank location, as shown on Figure 3-1. Soil boring OT-C540-Station 1 (sample numbers OTC540-IS-0001-062012 and OTC540-IS-0002-062012) was placed north of the abandoned septic tank along the influent line, OT-C540-Station 2 (sample numbers OTC540-IS-0003-062012 and OTC540-IS-0004-062012) was placed at the abandoned septic

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tank location, OT-C540-Station 3 (samples numbers OTC540-IS-0005-062012 and OTC540-IS-0006-062012) was placed south of the abandoned septic tank near the effluent line, and OT-C540-Station 4 (sample numbers OTC540-IS-0007-062012 and OTC540-IS-0008-062012) was placed in the leach field of the abandoned septic tank. All borings were advanced using direct push technology (DPT), with soil samples collected at depths of 3 to 5 ft and 10 to 12 ft at Station 1; and 7 to 9 ft and 14 to 16 ft at Station 2; 3 to 5 ft and 10 to 12 ft at Station 3; and 3 to 5 ft and 10 to 12 ft at Station 4. A confirmation sample (OTC540-IS-0009-091712) was collected from the 14 to 16 ft depth at OT-C540-Station 4C, located adjacent to OT-C540-Station 4, on September 17, 2012. The confirmation sample was intended to confirm the analytical result obtained for benzo(a)pyrene (1.03 milligrams per kilogram [mg/kg]) in sample OTC540-IS-0004-062012, originally collected at OT-C540-Station 2 from 14-16 ft bgs, however, the sample was inadvertently collected adjacent to Station 4 instead. Appendix C contains copies of the sample collection logs.

Soil samples were logged in the field in accordance with the Unified Soil Classification System requirements, and sample depths were in general accordance with the *RFI Work Plan* (USACE, 2010). Soil samples were not screened with a photoionization detector since there was no sensory evidence of contamination. Appendix D contains copies of the soil boring logs.

Soil samples for volatile organic compound (VOC) analysis were collected in accordance with EPA Method 5035, using a TerraCore® Sampler device (EPA, 1986), while non-VOC sample aliquots were placed in laboratory-provided containers. Samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), explosives, polychlorinated biphenyls (PCBs), target analyte list (TAL) metals, total petroleum hydrocarbons (TPH)-gasoline range organics (GRO), TPH-diesel range organics (DRO), TPH-oil range organics (ORO), cyanide, percent solids, and tritium by Accutest Laboratories, Inc., a National Environmental Laboratory Accreditation Program-accredited laboratory, using EPA analytical methods, as summarized on Table 3-1.

The excess sample core soil extracted using the DPT drilling method was placed in 55-gallon drums for later characterization and transport to a licensed disposal facility. The boreholes were abandoned upon completion by plugging from the bottom of the borehole to ground surface using bentonite pellets. Soil boring equipment was decontaminated between borings as detailed in Holloman AFB Standard Operating Procedure 2, “Sampling Equipment Decontamination” (provided in Appendix B of the *RFI Work Plan* [USACE, 2010]) and Shaw’s Standard Operating Procedure No. EI-FS-014, “Decontamination of Contact Sampling Equipment.”

3.4 Groundwater Investigation

The groundwater investigation at the Building 1251 former septic tank location indicated no groundwater present in the any of the soil borings, including Station 4 in the former septic tank leach field (the planned location for a groundwater monitoring well). As a result, a monitoring well was not installed, and groundwater sampling was not performed.

3.5 Investigation-Derived Waste

The nonhazardous IDW generated during the RFI at Building 1251 (OT-C540) were segregated into the following categories:

- Soil – drill cuttings soil
- Water – decontamination liquids.

Upon generation, investigation-derived waste was properly containerized and temporarily stored at the designated laydown yard, as specified by Holloman AFB. Wastes were contained in sealed, U.S. Department of Transportation–approved, steel 55-gallon drums (for soil cuttings and decontamination water), roll-off containers with liners and covers (for excavated waste soil), and a 1,400-gallon plastic tank (for waste water). The waste soil drums were emptied into 20-cubic yard roll-off containers, and the waste waters were pumped into a bulk plastic tank prior to characterization sampling and analysis for disposal. The drill cuttings from the Building 1251 Site were placed into the 20-cubic yard roll-off containers along with soils from other Holloman AFB investigation sites.

3.6 Site Surveying

Soil borings and other site features shown on Figure 3-1 were surveyed by Albuquerque Surveying Company, Inc. from Albuquerque, New Mexico, a state-licensed surveyor.

Horizontal coordinates are referenced to the North American Datum 1983 State Plane Coordinate System, New Mexico – Central, and surveyed to an accuracy of $\pm$1.0 ft. Vertical elevations are referenced to the North American Vertical Datum 1988 coordinate system to an accuracy of $\pm$0.01 ft. A copy of the survey results is presented in Appendix E.

3.7 Decontamination Procedures

A decontamination pad was constructed at the designated laydown area for decontamination of all downhole drilling equipment. The drilling rig was decontaminated prior to entering the site. Drilling equipment that came into contact with the borehole was decontaminated by hot-water pressure washing. Disposable equipment used for soil sample collection did not require decontamination.

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4.0 INVESTIGATION RESULTS AND EVALUATION

Soil analytical results presented in this section were used to delineate constituents of concern that may have been released to the environment, and confirm that no additional remedial measures are required.

4.1 Soil Analytical Results

DPT soil boring samples were collected during the Building 1251 RFI at the locations shown on Figure 3-1. All soil samples were sent to Accutest Laboratories, Inc., for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium analyses. Analytical results for the soil samples are presented in Table 4-1. Laboratory analytical data packages, and the data validation checklists for the soil sample data, are provided in Appendix F.

The analytical results for metals in Table 4-1 show that Holloman AFB soil samples contain significant amounts of calcium, typically greater than 100,000 mg/kg (10 percent), and can be as high as 250,000 mg/kg (25 percent). Calcium at these levels contributes spectral interferences during inductively-coupled plasma metals analysis, and can also clog the nebulizer that is used to introduce the sample. Sample dilution is the recommended method for solving both the spectral interference issue and the nebulizer clogging issue. However, sample dilution raises the analytical method detection limits (MDLs) for all associated metals, including thallium.

A typical method detection limit for thallium during inductively-coupled plasma analysis is 0.13 mg/kg. Diluting by a factor of 5 to 20 to eliminate calcium spectral interference and nebulizer clogging causes the thallium detection limit to be elevated by a factor of 5 to 20. This results in a MDL that is above the NMED residential SSL of 0.782 mg/kg thallium. Consequently, the required remedy to allow for proper equipment operation resulted in MDLs that were above the NMED residential SSL. However, thallium is not an element that is anticipated to be present at Building 1251 as a result of normal septic tank operation and maintenance.

The validated soil analytical results were compared with the NMED residential SSLs (NMED, 2012a), or the EPA RSLs (EPA, 2012a) if NMED residential SSLs were not established for a given analyte. In addition, a TPH screening level of 1,000 mg/kg was used to evaluate the laboratory analytical data. The 1,000 mg/kg action level for petroleum-contaminated soil is the Residential Direct Exposure Limit for unknown oil, listed in Table 6-2, TPH Screening Guidelines for Potable Groundwater, of the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a).

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The benzo(a)pyrene detection in OTC540-IS-0004-062012 (Station 2, 14 to 16 ft bgs) exceeded the NMED residential SSL. No other parameters had detections above the NMED residential SSL screening criteria in sample OTC540-IS-0004-062012, and all other samples met the NMED residential SSLs for all analytes. Likewise, all soil samples from all locations and depths had TPH-GRO, TPH-DRO, and TPH-ORO concentrations below the TPH screening level, and no tritium was detected in any of the soil samples.

Manganese was detected in OTC540-IS-0008-062112 (OT-C540-Station 4, 10 to 12 ft bgs) at a concentration of 571 mg/kg which exceeds the Holloman AFB soil background value (393 mg/kg), but is below the NMED residential SSL screening criteria (1,860 mg/kg). Zinc was detected in OTC540-IS-0004-062012 (OT-C540-Station 2, 14 to 16 ft bgs) at a concentration of 59.1 mg/kg which exceeds the Holloman AFB soil background value (54.6 mg/kg), but is below the NMED residential SSL screening criteria (23,500 mg/kg). No other soil detections exceeded the Holloman AFB soil background values.

4.2 Groundwater Analytical Results

The groundwater investigation at the Building 1251 former septic tank location indicated no groundwater present in the any of the soil borings, including Station 4 in the former septic tank leach field (the planned location for a groundwater monitoring well). As a result, a monitoring well was not installed, and groundwater sampling was not performed. The ephemeral nature of shallow groundwater at Building 1251 was observed at numerous other sites during the Holloman AFB RFIs, and lends uncertainty as to the reliability of the shallow groundwater (upper water table) as a water source. Furthermore, as stated in Section 3.2.4.2 of the *Basewide Septic Tank Solid Waste Management Units, RCRA Facility Investigation Work Plan, Holloman AFB, New Mexico* (USACE, 2010) groundwater may not require testing if it is determined that limited impacts to the soil column have been realized from the septic tanks leach field. As summarized in Section 4.1, the only parameter detected above the NMED residential SSLs was benzo(a)pyrene, in one boring, at a depth of 14 to 16 ft bgs.

4.3 Investigation-Derived Waste Analytical Results

A bulk waste characterization sample (LDY-IDW-01-090412) was collected from the bulk waste soil and analyzed for Toxicity Characteristic Leaching Procedure VOCs, SVOCs, and RCRA metals. The results are presented in Table 4-2. None of the waste soil analytical results were above the 40 Code of Federal Regulations Part 261.24 limits. The waste soil was managed as nonhazardous waste and was subsequently transported to Otero/Greentree Regional Landfill, Alamogordo, New Mexico for disposal (Waste Manifest in Appendix G-).

The waste water from equipment decontamination was sampled and analyzed for VOCs, SVOCs, TAL metals, TPH-GRO, TPH-DRO, and TPH-ORO, with the analytical results

presented in Table 4-3. The analytical results were reviewed by the Holloman AFB waste water treatment plant personnel, and subsequently accepted for disposal.

4.4 Risk-Based Evaluation

4.4.1 Soil

Nine soil samples were collected at Building 1251, from depths of 0 to 16 ft bgs, during the abandoned septic tank investigation. Per NMED (2012a), the soil depths of interest for a risk evaluation are 0 to 10 ft bgs for construction workers and residential receptors, and 0 to 1 ft bgs for commercial/industrial workers. Therefore, results from the screening assessment (Table 4-1) that present data for 0 to 10 ft bgs (four samples) were used for the Risk Evaluation.

Based on the results of the initial screening evaluation for 0 to 10 ft bgs soil, no chemicals had maximum detected concentrations greater than: (1) NMED residential SSLs or EPA RSLs (if NMED values have not been established) and (2) site-specific background values. Total cancer risk ratios and total hazard ratios (hazard index [HI]) to address potential additive toxicological effects were also assessed (per NMED 2012a, Section 5.0). This was conducted by using maximum detected concentrations of carcinogens and non-carcinogens, estimating risk and hazard ratios, and scaling a total cancer risk and total HI. The total cancer risk was less than 1.0×10^{-5} (total cancer risk: 5.1×10^{-6}) and the total HI was less than 1.0 (site HI: 0.53), as shown in Appendix H).

One chemical, benzo(a)pyrene, had a maximum detected concentration that exceeded the NMED soil screening value, but the sample was collected at a depth of 14 to 16 ft bgs. A shallower collocated sample collected at a depth of 7 to 9 ft bgs was non-detected. Therefore, there are no chemicals of potential concern (COPCs) in soil and future residential, current and/or future commercial/industrial worker, and current and/or future construction worker exposure scenarios are not health risks.

4.4.2 Groundwater

The groundwater investigation at the Building 1251 former septic tank location indicated no groundwater present in the any of the soil borings, including Station 4 in the former septic tank leach field (the planned location for a groundwater monitoring well). As a result, a monitoring well was not installed, groundwater sampling was not performed, and human health risk was not evaluated.

4.4.3 Risk-Based Conclusions

No COPCs were selected for soil and groundwater was not encountered during the investigation; therefore, future residential exposure, current and future commercial/industrial

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worker exposure, and current and future construction worker exposure are not health risks. In addition, total cancer risks and non-cancer hazards in soil were acceptable.

4.5 Ecological Evaluation

The former septic system at Building 1251 was located south of the building and just off the area that served as the parking lot. The location is flat-lying moderate to well vegetated. A screening-level ecological risk assessment (SLERA) Scoping Assessment Site Assessment Checklist was completed for the Building 1251 (OT-C540) septic tank system and is included in Appendix I. Results of the checklist Exclusion Criteria Decision Tree indicate that the site is a potential viable ecological habitat and a potential exposure pathway exists for soil; therefore, the SLERA was performed.

Soil data results from 0 to 10 ft bgs were included in the comparison and are provided in Table A of Appendix I. According to NMED (2012c), this is the potential depth of interest for wildlife, including burrowing animals. As shown in Table A (Appendix I), four soil samples were available within the 0 to 10 ft bgs zone. Detected constituents in soil included 16 metals. All other constituents analyzed for were non-detected.

Metals concentrations were compared to Holloman AFB soil background values (Table A, Appendix I). Detected concentrations of all metals did not exceed Holloman AFB soil background values in any soil samples evaluated. Therefore, no further evaluation was conducted for metals.

Since the detected concentrations of metals were all below respective background screening values, it is concluded that potential risks to the ecological system at and surrounding the former septic system at Building 1251 are acceptable.

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5.0 DATA QUALITY ASSURANCE AND DATA QUALITY CONTROL REVIEW

All analytical data was reviewed in accordance with EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA, 2004a) and the EPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (EPA, 2004b). Data qualifiers were added to the database prior to project use. The data tables provided in Section 4.0 show the data qualifiers added during data validation. Detailed data validation checklists for each data deliverable are provided in Appendix F.

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6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary and Conclusions

6.1.1 Soil

Nine soil samples were collected at various Holloman AFB Building 1251 locations during the abandoned septic tank investigation. The samples were analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium. Validated analytical results were compared with the NMED Residential SSLs, the NMED Residential Direct Exposure Limit for soil contaminated with unknown petroleum oil, and the Holloman AFB soil background values. One analyte, benzo(a)pyrene, was detected above the New Mexico Residential Soil screening values in one sample from one location. All other soil samples from all other locations and depths were non-detect or below their respective NMED Residential SSLs or NMED Residential Direct Exposure Limit.

The risk-based health screening concluded that there are no COPCs in soil at the depths of interest (0 to 10 ft bgs), and future residential, current and/or future commercial/industrial worker, and current and/or future construction worker exposure scenarios are not a health risk. Total cancer risks and non-cancer hazards were acceptable for soil.

The ecological evaluation concluded that potential risks to the ecological system at and surrounding the former septic system at Building 1251 are acceptable.

6.1.2 Groundwater

The groundwater investigation at the Building 1251 former septic tank location indicated no groundwater present in the any of the soil borings, including Station 4 in the former septic tank leach field (the planned location for a groundwater monitoring well). As a result, a monitoring well was not installed, groundwater sampling was not performed, and human health risk was not evaluated.

6.2 Recommendations

6.2.1 Soil

There are no COPCs in soil at the depths of interest (0 to 10 ft bgs), thus future residential, current and/or future commercial/industrial worker, and current and/or future construction worker exposure scenarios are not a health risk and total cancer risks and non-cancer hazards were acceptable for soil. In addition, the ecological evaluation concluded that potential risks to the ecological system at and surrounding the former septic system are acceptable. Therefore, no corrective action is recommended for soil at Building 1251.

6.2.2 Groundwater

Groundwater was not encountered during the subsurface investigation of the septic system at Building 1251. Therefore, no corrective action is needed for groundwater at Building 1251.

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Tables

Table 3-1
Sample Summary
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Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C540-Station 1	699989.0266	1695113.9508	6/20/2012	Investigation Soil	3 - 5	OTC540-IS-0001-062012	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/20/2012	Investigation Soil	10 - 12	OTC540-IS-0002-062012	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OTC-540-Station 2	699971.0008	1695119.8281	6/20/2012	Investigation Soil	7 - 9	OTC540-IS-0003-062012	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/20/2012	Investigation Soil	14 - 16	OTC540-IS-0004-062012	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1251 (OT-C540) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OTC-540-Station 3	699965.9693	1695113.1170	6/20/2012	Investigation Soil	3 - 5	OTC540-IS-0005-062012	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/20/2012	Investigation Soil	10 - 12	OTC540-IS-0006-062012	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OTC-540-Station 4	699948.3514	1695107.2427	6/21/2012	Investigation Soil	3 - 5	OTC540-IS-0007-062112	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			6/21/2012	Investigation Soil	10 - 12	OTC540-IS-0008-062112	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OTC-540-Station 4C	699948.3575	1695107.2670	9/17/2012	Investigation Soil	14 - 16	OTC540-IS-0009-091712	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B (Mercury)
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1251 (OT-C540) RFI Report
Holloman Air Force Base, New Mexico

Notes:

[a] Coordinates are in North American Datum, 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] EPA, 2007, Test Methods for Evaluating Soil Waste Physical/Chemical Methods, EPA Publication SW-846, Final Update IV. Available online at www.epa.gov/osw/hazard/testmethods/sw846.

Percent Solids and Total Dissolved Solids from *Standard Methods for the Examination of Water and Wastewater* , 19th edition, 1995.

bgs	Below ground surface.
DRO	Diesel range organics.
EPA	Environmental Protection Agency
ft	Feet/foot.
GRO	Gasoline range organics.
ORO	Investigation Soil.
PCB	Monitoring Well.
RCRA	Oil range organics.
RFI	Polychlorinated Biphenyl.
SVOC	Station.
TAL	Semivolatile organic compound.
TPH	Target analyte list.
VOC	Total petroleum hydrocarbons.
VOC	Volatile organic compound.

Table 4-1
Soil Analytical Data
Building 1251 (OT-C540) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC540-IS-0001-062012		OTC540-IS-0002-062012		OTC540-IS-0003-062012		OTC540-IS-0004-062012		OTC540-IS-0005-062012		OTC540-IS-0006-062012		OTC540-IS-0007-062112		OTC540-IS-0008-062112		OTC540-IS-0009-091712	
				Sample Date	6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/21/2012		6/21/2012		9/17/2012	
				Location	OT-C540-Station 1 influent line to tank		OT-C540-Station 1 influent line to tank		OT-C540-Station 2 septic tank		OT-C540-Station 2 septic tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 4 leach field		OT-C540-Station 4 leach field		OT-C540-Station 4C leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		14 - 16	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**80.4**		**83.9**		**95.4**		**93.9**		**83.9**		**86.7**		**87.7**		**85.6**		**87.7**	
VOLATILES (mg/kg)																						
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0012	U	0.0011	U	0.001	U	0.00095	U	0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U	0.0015	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0018	U	0.0018	U	0.0016	U	0.0015	U	0.002	U	0.0018	U	0.0016	U	0.0016	U	0.0021	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0012	U	0.0011	U	0.001	U	0.00095	U	0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0012	U	0.0011	U	0.001	U	0.00095	U	0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U
1,1-DICHLOROETHENE	NE	240	449		0.0015	U	0.0015	U	0.0013	U	0.0012	U	0.0017	U	0.0015	U	0.0014	U	0.0013	U	0.0017	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0013	UJ	0.0012	U	0.0011	U	0.001	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U	0.0015	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0024	U	0.0024	U	0.0021	U	0.002	U	0.0027	U	0.0025	U	0.0022	U	0.0022	U	0.0029	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.0011	U	0.001	U	0.00093	U	0.00086	U	0.0012	U	0.0011	U	0.00097	U	0.00094	U	0.0012	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0012	UJ	0.0011	U	0.001	U	0.00095	U	0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.0011	U	0.001	U	0.00093	U	0.00086	U	0.0012	U	0.0011	U	0.00097	U	0.00094	U	0.0012	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U	0.0015	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0013	UJ	0.0012	U	0.0011	U	0.001	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U	0.0015	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0012	UJ	0.0011	U	0.001	U	0.00095	U	0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U
2-HEXANONE	NE	210	NE		0.0057	U	0.0056	U	0.005	U	0.0047	U	0.0064	U	0.0058	U	0.0052	U	0.0051	U	0.0067	U
ACETONE	NE	61000	66600		0.021	U	0.021	U	0.019	U	0.13		0.024	U	0.0256	J	0.019	U	0.263		0.0553	J
BENZENE	NE	1.1	15.4		0.0016	U	0.0016	U	0.0014	U	0.0013	U	0.0018	U	0.0016	U	0.0015	U	0.0014	U	0.0019	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0012	U	0.0011	U	0.001	U	0.00095	U	0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U
BROMOFORM	NE	62	616		0.0016	U	0.0016	U	0.0014	U	0.0013	U	0.0018	U	0.0016	U	0.0015	U	0.0014	U	0.0019	U
BROMOMETHANE	NE	7.3	16.5		0.0021	U	0.0021	U	0.0019	U	0.0017	U	0.0024	U	0.0022	U	0.0019	U	0.0019	U	0.0025	U
CARBON DISULFIDE	NE	820	1530		0.0021	U	0.0021	U	0.0019	U	0.0017	U	0.0024	U	0.0022	U	0.0019	U	0.0019	U	0.0025	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0019	U	0.0019	U	0.0017	U	0.0016	U	0.0021	U	0.0019	U	0.0017	U	0.0017	U	0.0022	U
CHLOROBENZENE	NE	290	376		0.0011	UJ	0.001	U	0.00093	U	0.00086	U	0.0012	U	0.0011	U	0.00097	U	0.00094	U	0.0012	U
CHLOROETHANE	NE	15000	29800		0.0021	U	0.0021	U	0.0019	U	0.0017	U	0.0024	U	0.0022	U	0.0019	U	0.0019	U	0.0025	U
CHLOROFORM	NE	0.29	5.86		0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U	0.0015	U
CHLOROMETHANE	NE	120	275		0.0021	U	0.0021	U	0.0019	U	0.0017	U	0.0024	U	0.0022	U	0.0019	U	0.0019	U	0.0025	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0016	U	0.0016	U	0.0014	U	0.0013	U	0.0018	U	0.0016	U	0.0015	U	0.0014	U	0.0019	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0011	U	0.001	U	0.00093	U	0.00086	U	0.0012	U	0.0011	U	0.00097	U	0.00094	U	0.0012	U
CYCLOHEXANE	NE	7000	NE		0.0015	U	0.0015	U	0.0013	U	0.0012	U	0.0017	U	0.0015	U	0.0014	U	0.0013	U	0.0017	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.0011	U	0.001	U	0.00093	U	0.00086	U	0.0012	U	0.0011	U	0.00097	U	0.00094	U	0.0012	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0016	U	0.0016	U	0.0014	U	0.0013	U	0.0018	U	0.0016	U	0.0015	U	0.0014	U	0.0019	UJ
ETHYLBENZENE	NE	5.4	68.4		0.0011	UJ	0.001	U	0.00093	U	0.00086	U	0.0012	U	0.0011	U	0.00097	U	0.0047		0.0012	U
ISOPROPYLBENZENE	NE	2100	2430		0.0012	UJ	0.0011	U	0.001	U	0.00095	U	0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U
METHYL ACETATE	NE	78000	78200		0.013	U	0.013	U	0.012	U	0.011	U	0.015	U	0.013	U	0.012	U	0.012	U	0.0457	
METHYL ETHYL KETONE	NE	28000	37100		0.0064	U	0.0063	U	0.0057	U	0.0053	U	0.0072	U	0.0066	U	0.0059	R	0.0057	R	0.0076	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0058	U	0.0057	U	0.0051	U	0.0047	U	0.0065	U	0.0059	U	0.0053	U	0.0052	U	0.0068	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0014	UJ	0.0014	U	0.0012	U	0.0011	U	0.0015	U	0.0014	U	0.0013	U	0.0012	U	0.0016	U
METHYLENE CHLORIDE	NE	56	409		0.0048	U	0.0048	U	0.0043	U	0.004	U	0.0055	U	0.005	U	0.0045	U	0.0045	J	0.0057	U

Table 4-1
Soil Analytical Data
Building 1251 (OT-C540) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC540-IS-0001-062012		OTC540-IS-0002-062012		OTC540-IS-0003-062012		OTC540-IS-0004-062012		OTC540-IS-0005-062012		OTC540-IS-0006-062012		OTC540-IS-0007-062112		OTC540-IS-0008-062112		OTC540-IS-0009-091712	
				Sample Date	6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/21/2012		6/21/2012		9/17/2012	
				Location	OT-C540-Station 1 influent line to tank		OT-C540-Station 1 influent line to tank		OT-C540-Station 2 septic tank		OT-C540-Station 2 septic tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 4 leach field		OT-C540-Station 4 leach field		OT-C540-Station 4C leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		14 - 16	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																						
STYRENE	NE	6300	7280		0.0027	UJ	0.0027	U	0.0024	U	0.0022	U	0.0031	U	0.0028	U	0.0025	U	0.0024	U	0.0032	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0021	U	0.0021	U	0.0019	U	0.0017	U	0.0024	U	0.0022	U	0.0019	U	0.0019	U	0.0025	U
TETRACHLOROETHYLENE	NE	22	7.02		0.0011	U	0.001	U	0.00093	U	0.00086	U	0.0012	U	0.0011	U	0.00097	U	0.00094	U	0.0012	U
TOLUENE	NE	5000	5270		0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U	0.0013	U	0.0012	U	0.0013	J	0.0015	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0016	U	0.0016	U	0.0014	U	0.0013	U	0.0018	U	0.0016	U	0.0015	U	0.0014	U	0.0019	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0012	U	0.0011	U	0.001	U	0.00095	U	0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U	0.0015	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0021	U	0.0021	U	0.0019	U	0.0017	U	0.0024	U	0.0022	U	0.0019	U	0.0019	U	0.0025	U
VINYL CHLORIDE	NE	0.06	0.728		0.0016	U	0.0016	U	0.0014	U	0.0013	U	0.0018	U	0.0016	U	0.0015	U	0.0014	U	0.0019	U
XYLENES, TOTAL	NE	630	814		0.0034	UJ	0.0033	U	0.003	U	0.0028	U	0.0038	U	0.0034	U	0.0031	U	0.0267		0.004	U
SEMIVOLATILES (mg/kg)																						
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	4.6	91.5		0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
2,4-DICHLOROPHENOL	NE	180	183		0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.026	U	0.025	U	0.022	U	0.022	U	0.025	U	0.024	U	0.024	U	0.024	U	0.024	U
2,4-DINITROPHENOL	NE	120	122		0.41	U	0.39	U	0.35	U	0.35	U	0.4	U	0.38	U	0.38	U	0.38	U	0.38	UJ
2,4-DINITROTOLUENE	NE	1.6	15.7		0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
2,6-DINITROTOLUENE	NE	61	61.1		0.024	U	0.023	U	0.021	U	0.021	U	0.023	U	0.023	U	0.022	U	0.023	U	0.022	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
2-CHLOROPHENOL	NE	390	391		0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
2-METHYLNAPHTHALENE	NE	230	NE		0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
2-METHYLPHENOL	NE	3100	NE		0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
2-NITROANILINE	NE	610	NE		0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
2-NITROPHENOL	NE	NE	NE		0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
3-NITROANILINE	NE	NE	NE		0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.083	U	0.079	U	0.07	U	0.07	U	0.079	U	0.076	U	0.075	U	0.077	U	0.076	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
4-CHLOROANILINE	NE	2.4	NE		0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	UJ	0.019	U	0.019	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
4-NITROANILINE	NE	24	NE		0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
4-NITROPHENOL	NE	NE	NE		0.17	U	0.16	U	0.14	U	0.14	U	0.16	U	0.15	U	0.15	U	0.15	UJ	0.15	U
ACENAPHTHENE	NE	3400	3440		0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
ACENAPHTHYLENE	NE	NE	NE		0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
ACETOPHENONE	NE	7800	7820		0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
ANTHRACENE	NE	17000	17200		0.021	U	0.02	U	0.017	U	0.11	J	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
ATRAZINE	NE	2.1	NE		0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U

Table 4-1
Soil Analytical Data
Building 1251 (OT-C540) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC540-IS-0001-062012		OTC540-IS-0002-062012		OTC540-IS-0003-062012		OTC540-IS-0004-062012		OTC540-IS-0005-062012		OTC540-IS-0006-062012		OTC540-IS-0007-062112		OTC540-IS-0008-062112		OTC540-IS-0009-091712	
				Sample Date	6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/21/2012		6/21/2012		9/17/2012	
				Location	OT-C540-Station 1 influent line to tank		OT-C540-Station 1 influent line to tank		OT-C540-Station 2 septic tank		OT-C540-Station 2 septic tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 4 leach field		OT-C540-Station 4 leach field		OT-C540-Station 4C leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		14 - 16	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																						
BENZALDEHYDE	NE	7800	NE	0.21	U	0.2	U	0.17	U	0.17	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.021	U	0.02	U	0.017	U	1.01		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZO(A)PYRENE	NE	0.015	0.148	0.021	U	0.02	U	0.017	U	1.03		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.021	U	0.02	U	0.017	U	1.15		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.021	U	0.02	U	0.017	U	0.663		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.021	U	0.02	U	0.017	U	0.394		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
BIPHENYL	NE	51	57.1	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.083	U	0.079	U	0.07	U	0.07	U	0.079	U	0.076	U	0.075	U	0.077	U	0.0907	J
CAPROLACTAM	NE	31000	NE	0.066	U	0.063	U	0.056	U	0.056	U	0.063	U	0.061	U	0.06	U	0.061	U	0.061	U
CARBAZOLE	NE	NE	NE	0.021	U	0.02	U	0.017	U	0.0307	J	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
CHRYSENE	NE	15	148	0.021	U	0.02	U	0.017	U	1.16		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.021	U	0.02	U	0.017	U	0.122	J	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
DIBENZOFURAN	NE	78	NE	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
DIETHYL PHTHALATE	NE	49000	48900	0.083	U	0.079	U	0.07	U	0.07	U	0.079	U	0.076	U	0.075	U	0.077	U	0.076	U
DIMETHYL PHTHALATE	NE	611000	611000	0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.083	U	0.079	U	0.07	U	0.07	U	0.079	U	0.076	U	0.075	U	0.077	U	0.076	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
FLUORANTHENE	NE	2300	2290	0.021	U	0.02	U	0.017	U	1.45		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
FLUORENE	NE	2300	2290	0.021	U	0.02	U	0.017	U	0.0244	J	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.091	U	0.087	U	0.077	U	0.077	U	0.087	U	0.084	U	0.083	U	0.085	U	0.084	UJ
HEXACHLOROETHANE	NE	12	42.8	0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.021	U	0.02	U	0.017	U	0.605		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
ISOPHORONE	NE	510	5120	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	UJ	0.019	U
M,P-CRESOL	NE	NE	NE	0.03	U	0.028	U	0.025	U	0.025	U	0.029	U	0.027	U	0.027	U	0.028	U	0.027	U
NAPHTHALENE	NE	3.6	43.0	0.033	U	0.031	U	0.028	U	0.028	U	0.032	U	0.031	U	0.03	U	0.031	U	0.03	U
NITROBENZENE	NE	4.8	53.5	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.25	U	0.24	U	0.21	U	0.21	U	0.24	U	0.23	U	0.23	U	0.23	U	0.23	U
PHENANTHRENE	NE	1830	1830	0.021	U	0.02	U	0.017	U	0.511		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
PHENOL	NE	18000	18300	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
PYRENE	NE	1700	1720	0.021	U	0.02	U	0.017	U	1.62		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U

Table 4-1
Soil Analytical Data
Building 1251 (OT-C540) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC540-IS-0001-062012		OTC540-IS-0002-062012		OTC540-IS-0003-062012		OTC540-IS-0004-062012		OTC540-IS-0005-062012		OTC540-IS-0006-062012		OTC540-IS-0007-062112		OTC540-IS-0008-062112		OTC540-IS-0009-091712	
				Sample Date	6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/21/2012		6/21/2012		9/17/2012	
				Location	OT-C540-Station 1 influent line to tank		OT-C540-Station 1 influent line to tank		OT-C540-Station 2 septic tank		OT-C540-Station 2 septic tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 4 leach field		OT-C540-Station 4 leach field		OT-C540-Station 4C leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		14 - 16	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																						
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
1,3-DINITROBENZENE	NE	6.10	NE	0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
2,4-DINITROTOLUENE	NE	1.60	15.7	0.089	U	0.076	U	0.075	U	0.085	U	0.094	U	0.084	U	0.077	U	0.083	U	0.08	U
2,6-DINITROTOLUENE	NE	61.0	61.1	0.079	U	0.068	U	0.068	U	0.076	U	0.084	U	0.075	U	0.069	U	0.074	U	0.071	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
2-NITROTOLUENE	NE	2.90	29.1	0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
3-NITROTOLUENE	NE	6.10	7.82	0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
4-NITROTOLUENE	NE	30.0	244.4	0.092	U	0.079	U	0.079	U	0.089	U	0.098	U	0.087	U	0.08	U	0.086	U	0.083	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
NITROBENZENE	NE	4.80	53.5	0.085	U	0.073	U	0.072	U	0.082	U	0.09	U	0.08	U	0.074	U	0.079	U	0.076	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
TETRYL	NE	240.0	244.0	0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
PCBS (mg/kg)																						
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0083	UJ	0.0083	UJ	0.0069	U	0.0071	U	0.0078	U	0.0076	U	0.0076	U	0.0077	U	0.0076	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.01	U	0.01	U	0.0086	U	0.0088	U	0.0098	U	0.0095	U	0.0095	U	0.0096	U	0.0095	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.01	U	0.01	U	0.0086	U	0.0088	U	0.0098	U	0.0095	U	0.0095	U	0.0096	U	0.0095	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0083	U	0.0083	U	0.0069	U	0.0071	U	0.0078	U	0.0076	U	0.0076	U	0.0077	U	0.0076	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0083	U	0.0083	U	0.0069	U	0.0071	U	0.0078	U	0.0076	U	0.0076	U	0.0077	U	0.0076	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0083	U	0.0083	U	0.0069	U	0.0071	U	0.0078	U	0.0076	U	0.0076	U	0.0077	U	0.0076	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0083	U	0.0083	U	0.0069	U	0.0071	U	0.0078	U	0.0076	U	0.0076	U	0.0077	U	0.0076	U
METALS (mg/kg)																						
ALUMINUM	13722	77000	78000	5800		3140		4390		4460		3400		3400		4160		4380		4080	J
ANTIMONY	1.6	31	31.3	1	U	1.1	U	0.89	U	0.95	U	1	U	1	U	1	U	1.2	U	0.81	J
ARSENIC	3.7	0.39	3.90	2	J	1.1	U	1.3	J	0.95	U	1	U	1	U	1.5	J	1.2	J	0.75	U
BARIUM	169.3	15000	15600	68.4	J	29.8	J	44.8	J	53.1	J	50.4	J	50.4	J	139		45.9	J	25.3	J
BERYLLIUM	1.6	160	156	0.51	U	0.54	U	0.44	U	0.48	U	0.51	U	0.51	U	0.52	U	0.58	U	0.38	U
CADMIUM	0.3	70	70.3	0.51	U	0.54	U	0.44	U	0.48	U	0.51	U	0.51	U	0.52	U	0.58	U	0.38	UJ
CALCIUM	317332	NE	NE	212000		231000		177000		173000		255000		255000		165000		237000		197000	
CHROMIUM[d]	25	117000	117000	5	J	2.9	J	6.3		5.4		2.6	J	2.6	J	2.9	J	3.8	J	4.4	J
COBALT	7.7	23	NE	2.3	J	1.2	J	2.6	J	2.3	J	1.5	J	1.5	J	1.3	J	2.9	J	1.1	J
COPPER	13	3100	3130	3.1	J	1.7	J	4.5	J	4.9	J	2.7	J	2.7	J	1.8	J	3.8	J	1.8	J
IRON	23049	55000	54800	5060		2720		5720		5280		2640		2640		2900		3980		3020	J
LEAD	10.9	400	400	3.4	J	1.6	J	3.7	J	3.9	J	1.2	J	1.2	J	1.7	J	2.5	J	1.7	J
MAGNESIUM	16991	NE	NE	4230		2050	J	6750		3820		3160		3160		2100	J	2780	J	1980	J
MANGANESE	393	1800	1860	99.1		76.1		329		125		47.5		47.5		38.8		571		36	J
MERCURY	0.0108	10	15.6	0.01	U	0.0089	U	0.0083	U	0.0087	U	0.0093	U	0.0093	U	0.0092	U	0.009	U	0.0089	U
NICKEL	17.4	1500	1560	4.6	J	2.5	J	6	J	4.9	J	3.1	J	1.2	J	2.9	J	7.9	J	2.7	J
POTASSIUM	5077	NE	NE	1660	J	909	J	832	J	936	J	1130	J	514	J	1010	J	1190	J	1060	J

Table 4-1
Soil Analytical Data
Building 1251 (OT-C540) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC540-IS-0001-062012		OTC540-IS-0002-062012		OTC540-IS-0003-062012		OTC540-IS-0004-062012		OTC540-IS-0005-062012		OTC540-IS-0006-062012		OTC540-IS-0007-062112		OTC540-IS-0008-062112		OTC540-IS-0009-091712	
				Sample Date	6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/21/2012		6/21/2012		9/17/2012	
				Location	OT-C540-Station 1 influent line to tank		OT-C540-Station 1 influent line to tank		OT-C540-Station 2 septic tank		OT-C540-Station 2 septic tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 4 leach field		OT-C540-Station 4 leach field		OT-C540-Station 4C leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		14 - 16	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
METALS (mg/kg)																						
SELENIUM	1.4	390	391		2	U	2.2	U	1.8	U	1.9	U	2	U	2.1	U	2.1	U	2.3	U	1.5	U
SILVER	1.1	390	391		0.51	U	0.54	U	0.44	U	0.48	U	0.51	U	0.53	U	0.52	U	0.58	U	0.38	U
SODIUM	5196	NE	NE		560	U	600	U	490	U	520	U	605	J	590	U	1900	J	1560	J	1070	J
THALLIUM	1.3	0.78	0.782		1.3	U	1.4	U	1.2	U	1.2	U	1.3	U	1.4	U	1.4	U	1.5	U	0.98	UJ
VANADIUM	42.6	390	391		15.2	J	5.9	J	11.8	J	10.2	J	7.4	J	3.2	J	8.3	J	9.2	J	4.8	J
ZINC	54.6	23000	23500		14		7.7	J	28.3		59.1		7.7	J	5.3	J	8.2	J	10.4	J	10	J
PETROLEUM HYDROCARBONS (mg/kg)																						
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000		3.8	U	3.3	U	2.6	U	2.2	U	3.4	U	3.6	U	2.7	U	3.5	U	4.2	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000		4.1	U	3.9	U	3.5	U	3.5	U	3.9	U	3.8	U	3.8	U	3.9	U	3.8	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000		4.1	U	4.45	J	3.5	U	3.5	U	3.9	U	3.8	U	3.8	U	3.9	U	3.8	U
CYANIDE (mg/kg)																						
CYANIDE	NE	22.0	46.9		0.073	U	0.07	U	0.062	U	0.064	U	0.072	U	0.068	U	0.066	U	0.07	U	0.066	U
TRITIUM (pCi/g)																						
TRITIUM	NE	NE	NE		3.98	U	3.78	U	4.12	U	3.94	U	4.04	U	4.09	U	4.23	U	4.06	U	3.84	U

Table 4-1
Soil Analytical Data
Buidling 1251 (OT-C540) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Table 4-2
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	LDY-IDW01-090412	
		Sample Date	9/4/2012	
		Sample Type	Waste	
		40 CFR 261 Waste Characteristic Criteria	Result	Lab Qual
General Chemistry				
Corrosivity as pH	pH Units	> 2 and < 12.5	**7.7**	
Cyanide Reactivity	mg/kg	< 250	1.5	U
Ignitability (Flashpoint)	°F	> 140 °F	>200	
Solids, Percent	%	-	**84.4**	
Sulfide Reactivity	mg/kg	< 500	59	U
TCLP Volatiles				
Benzene	mg/L	0.5	0.0020	U
Chlorobenzene	mg/L	100	0.0020	U
Chloroform	mg/L	6	0.0022	U
Carbon tetrachloride	mg/L	0.5	0.0025	U
1,1-Dichloroethylene	mg/L	0.7	0.0023	U
1,2-Dichloroethane	mg/L	0.5	0.0020	U
p-Dichlorobenzene	mg/L	7.5	0.0023	U
Methyl ethyl ketone	mg/L	200	0.0020	U
Tetrachloroethylene	mg/L	0.7	0.0025	U
Trichloroethylene	mg/L	0.5	0.0026	U
Vinyl chloride	mg/L	0.2	0.0022	U
TCLP Semivolatiles				
2-Methylphenol	mg/L	200	0.0054	U
3&4-Methylphenol	mg/L	200	0.011	U
Pentachlorophenol	mg/L	100	0.054	U
2,4,5-Trichlorophenol	mg/L	400	0.0050	U
2,4,6-Trichlorophenol	mg/L	2	0.0050	U
1,4-Dichlorobenzene	mg/L	7.5	0.010	U
2,4-Dinitrotoluene	mg/L	0.13	0.0050	U
Hexachlorobenzene	mg/L	0.13	0.0056	U
Hexachlorobutadiene	mg/L	0.5	0.010	U
Hexachloroethane	mg/L	3	0.010	U
Nitrobenzene	mg/L	2	0.0059	U
Pyridine	mg/L	100	0.016	U
TCLP Metals				
Arsenic	mg/L	5	0.020	U
Barium	mg/L	100	**0.12**	J
Cadmium	mg/L	1	0.010	U
Chromium	mg/L	5	0.010	U
Lead	mg/L	5	0.010	U
Mercury	mg/L	0.2	0.00050	U
Selenium	mg/L	1	0.020	U
Silver	mg/L	5	0.010	U

Table 4-2
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

°F = degrees Fahrenheit
> = greater than
< = less than
% = percent
CFR = Code of Federal Regulations
J = estimated value
Lab Qual = laboratory qualifier
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
TCLP = Toxicity Characteristic Leaching Procedure
U = not detected at the detection limit shown

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles				
Acetone	µg/L	NE	10	U
Benzene	µg/L	5	0.21	U
Bromodichloromethane	µg/L	80	0.20	U
Bromoform	µg/L	80	0.34	U
Chlorobenzene	µg/L	100	0.20	U
Chloroethane	µg/L	NE	0.50	U
Chloroform	µg/L	80	0.26	U
Carbon disulfide	µg/L	NE	0.49	U
Carbon tetrachloride	µg/L	5	0.31	U
Cyclohexane	µg/L	NE	0.48	U
1,1-Dichloroethane	µg/L	NE	0.21	U
1,1-Dichloroethylene	µg/L	7	0.20	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.71	U
1,2-Dibromoethane	µg/L	0.05	0.30	U
1,2-Dichloroethane	µg/L	5	0.22	U
1,2-Dichloropropane	µg/L	5	0.26	U
Dibromochloromethane	µg/L	80	0.20	U
Dichlorodifluoromethane	µg/L	NE	0.50	U
cis-1,2-Dichloroethylene	µg/L	70	**0.42**	J
cis-1,3-Dichloropropene	µg/L	NE	0.22	U
m-Dichlorobenzene	µg/L	NE	0.25	U
o-Dichlorobenzene	µg/L	600	0.22	U
p-Dichlorobenzene	µg/L	75	0.20	U
trans-1,2-Dichloroethylene	µg/L	100	0.23	U
trans-1,3-Dichloropropene	µg/L	NE	0.21	U
Ethylbenzene	µg/L	700	0.29	U
Freon 113	µg/L	NE	0.33	U
2-Hexanone	µg/L	NE	2.0	U
Isopropylbenzene	µg/L	NE	0.20	U
4-Methyl-2-pentanone	µg/L	NE	2.3	U
Methyl Acetate	µg/L	NE	5.0	U
Methyl bromide	µg/L	NE	0.79	U
Methyl chloride	µg/L	NE	0.50	U
Methylcyclohexane	µg/L	NE	0.20	U
Methylene chloride	µg/L	5	2.0	U
Methyl ethyl ketone	µg/L	NE	3.1	U
Methyl Tert Butyl Ether	µg/L	NE	0.21	U
Styrene	µg/L	100	0.20	U

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles (continued)				
1,1,1-Trichloroethane	µg/L	200	0.20	U
1,1,2,2-Tetrachloroethane	µg/L	NE	0.24	U
1,1,2-Trichloroethane	µg/L	5	0.20	U
1,2,4-Trichlorobenzene	µg/L	70	0.50	U
Tetrachloroethylene	µg/L	5	0.32	U
Toluene	µg/L	1000	0.20	U
Trichloroethylene	µg/L	5	0.31	U
Trichlorofluoromethane	µg/L	NE	0.50	U
Vinyl chloride	µg/L	2	0.44	U
Xylene (total)	µg/L	10000	0.50	U
Semivolatiles				
2-Chlorophenol	µg/L	NE	0.68	U
4-Chloro-3-methyl phenol	µg/L	NE	0.78	U
2,4-Dichlorophenol	µg/L	NE	0.67	U
2,4-Dimethylphenol	µg/L	NE	0.74	U
2,4-Dinitrophenol	µg/L	NE	5.0	U
4,6-Dinitro-o-cresol	µg/L	NE	1.4	U
2-Methylphenol	µg/L	NE	0.69	U
3&4-Methylphenol	µg/L	NE	1.3	U
2-Nitrophenol	µg/L	NE	0.65	U
4-Nitrophenol	µg/L	NE	4.8	U
Pentachlorophenol	µg/L	1	4.8	U
Phenol	µg/L	NE	0.53	U
2,4,5-Trichlorophenol	µg/L	NE	0.86	U
2,4,6-Trichlorophenol	µg/L	NE	0.75	U
Acenaphthene	µg/L	NE	0.67	U
Acenaphthylene	µg/L	NE	0.67	U
Acetophenone	µg/L	NE	0.72	U
Anthracene	µg/L	NE	0.72	U
Atrazine	µg/L	3	0.83	U
Benzaldehyde	µg/L	NE	4.8	U
Benzo(a)anthracene	µg/L	NE	0.52	U
Benzo(a)pyrene	µg/L	0.2	0.55	U
Benzo(b)fluoranthene	µg/L	NE	0.73	U
Benzo(g,h,i)perylene	µg/L	NE	0.64	U
Benzo(k)fluoranthene	µg/L	NE	0.64	U
4-Bromophenyl phenyl ether	µg/L	NE	0.76	U
Butyl benzyl phthalate	µg/L	NE	0.68	U
1,1'-Biphenyl	µg/L	NE	0.92	U
2-Chloronaphthalene	µg/L	NE	0.70	U

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Semivolatiles (continued)				
4-Chloroaniline	µg/L	NE	0.66	U
Caprolactam	µg/L	NE	2.4	U
Carbazole	µg/L	NE	0.50	U
Chrysene	µg/L	NE	0.56	U
bis(2-Chloroethoxy)methane	µg/L	NE	0.67	U
bis(2-Chloroethyl)ether	µg/L	NE	0.69	U
bis(2-Chloroisopropyl)ether	µg/L	NE	0.76	U
4-Chlorophenyl phenyl ether	µg/L	NE	0.84	U
2,4-Dinitrotoluene	µg/L	NE	0.66	U
2,6-Dinitrotoluene	µg/L	NE	0.77	U
3,3'-Dichlorobenzidine	µg/L	NE	0.71	U
Dibenzo(a,h)anthracene	µg/L	NE	0.56	U
Dibenzofuran	µg/L	NE	0.72	U
Di-n-butyl phthalate	µg/L	NE	0.96	U
Di-n-octyl phthalate	µg/L	NE	0.96	U
Diethyl phthalate	µg/L	NE	0.96	U
Dimethyl phthalate	µg/L	NE	0.77	U
bis(2-Ethylhexyl)phthalate	µg/L	6	1.1	U
Fluoranthene	µg/L	NE	0.56	U
Fluorene	µg/L	NE	0.73	U
Hexachlorobenzene	µg/L	1	0.66	U
Hexachlorobutadiene	µg/L	NE	0.92	U
Hexachlorocyclopentadiene	µg/L	50	0.76	U
Hexachloroethane	µg/L	NE	0.71	U
Indeno(1,2,3-cd)pyrene	µg/L	NE	0.55	U
Isophorone	µg/L	NE	0.61	U
2-Methylnaphthalene	µg/L	NE	0.66	U
2-Nitroaniline	µg/L	NE	0.72	U
3-Nitroaniline	µg/L	NE	0.62	U
4-Nitroaniline	µg/L	NE	0.93	U
Naphthalene	µg/L	NE	0.61	U
Nitrobenzene	µg/L	NE	0.69	U
N-Nitroso-di-n-propylamine	µg/L	NE	0.82	U
N-Nitrosodiphenylamine	µg/L	NE	0.96	U
Phenanthrene	µg/L	NE	0.68	U
Pyrene	µg/L	NE	0.65	U
Petroleum Hydrocarbons				
Gasoline Range Organics (C6-C10)	mg/L	NE	0.05	U
Diesel Range Organics (C10-C28)	mg/L	NE	**0.115**	J
Oil Range Organics (C28-C40)	mg/L	NE	0.10	U

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Metals				
Aluminum	µg/L	NE	**36.2**	J
Antimony	µg/L	6	**6.7**	J
Arsenic	µg/L	10	2.5	U
Barium	µg/L	2000	**29.1**	J
Beryllium	µg/L	4	0.50	U
Cadmium	µg/L	5	1.0	U
Calcium	µg/L	NE	**654,000**	
Chromium	µg/L	100	4	U
Cobalt	µg/L	NE	**6.2**	J
Copper	µg/L	1300	**2.9**	J
Iron	µg/L	NE	**97.5**	J
Lead	µg/L	15	2.2	U
Magnesium	µg/L	NE	**310,000**	
Manganese	µg/L	NE	**179**	
Mercury	µg/L	2	0.03	U
Nickel	µg/L	NE	**3.7**	J
Potassium	µg/L	NE	**16,500**	
Selenium	µg/L	50	4.0	U
Silver	µg/L	NE	0.50	U
Sodium	µg/L	NE	**762,000**	
Thallium	µg/L	2	0.078	U
Vanadium	µg/L	NE	**4.5**	J
Zinc	µg/L	NE	**12.8**	J

Table 4-3
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

[a] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

EPA = U.S. Environmental Protection Agency.

J = estimated value.

MCL = maximum contaminant level.

µg/L = micrograms per liter.

mg/L = milligrams per liter.

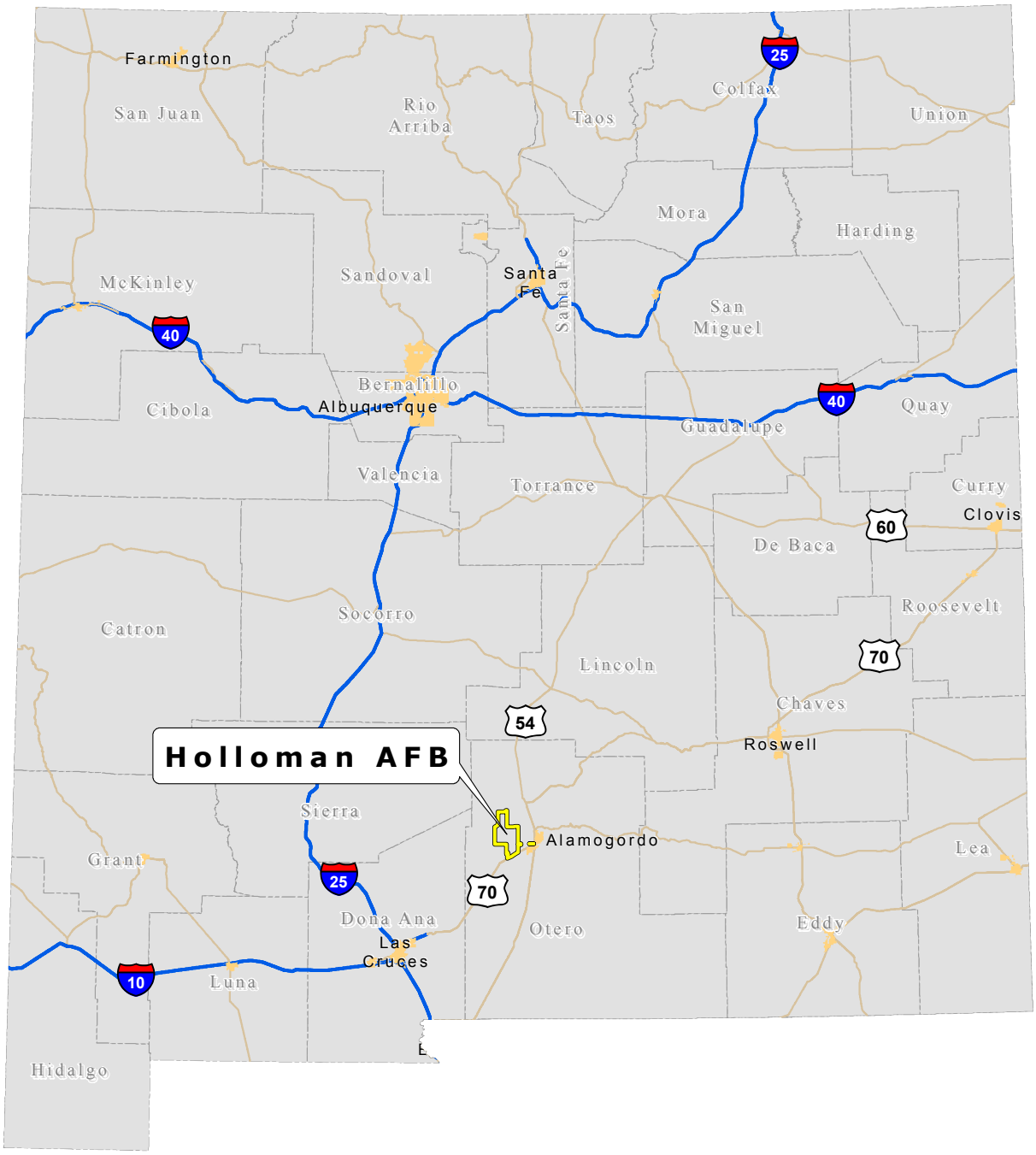
NE = not established

RSL = regional screening level.

U = not detected at the detection limit shown.

VQ = validation qualifier.

Figures



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Date: 8/28/2013

Approved By: BFoss

Checked By: CLong

Drawn By: BGrod

Office: Hou

Legend

Holloman AFB

N

WGS 84 UTM Zone 13N Meters

0 20 40 80
Kilometers

0 10 20 40
Miles

Figure 1-1

Holloman Air Force Base Location

Holloman AFB, New Mexico

Office	Drawn By	Checked By	Approved By	Date	File Path
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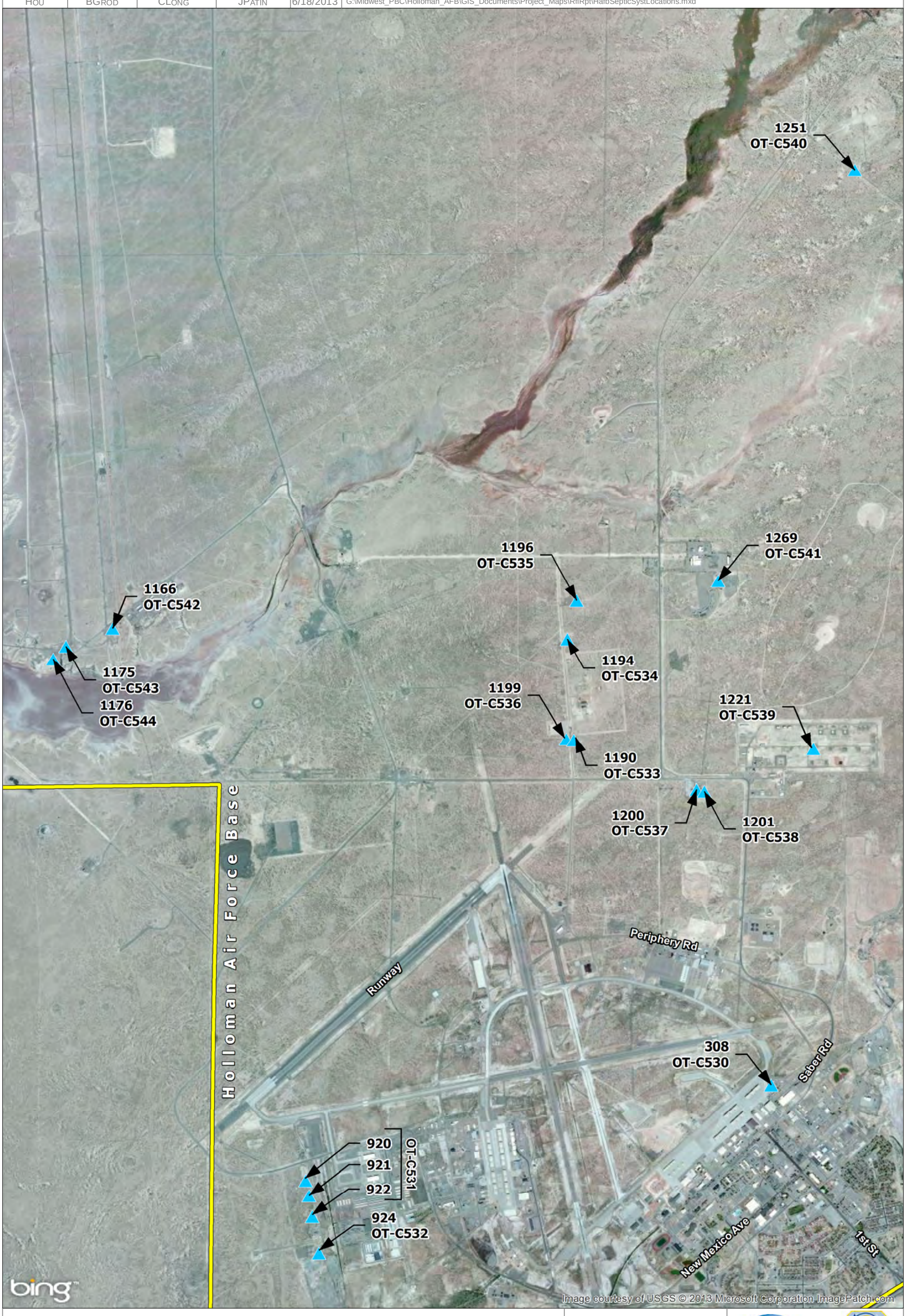


LEGEND

- Holloman AFB
- Septic Tank System

N

WGS 84 UTM Zone 13N
Meters

1 inch = 2,800 feet

0 700 1,400 2,800
Feet

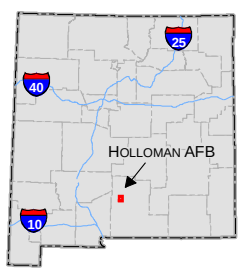
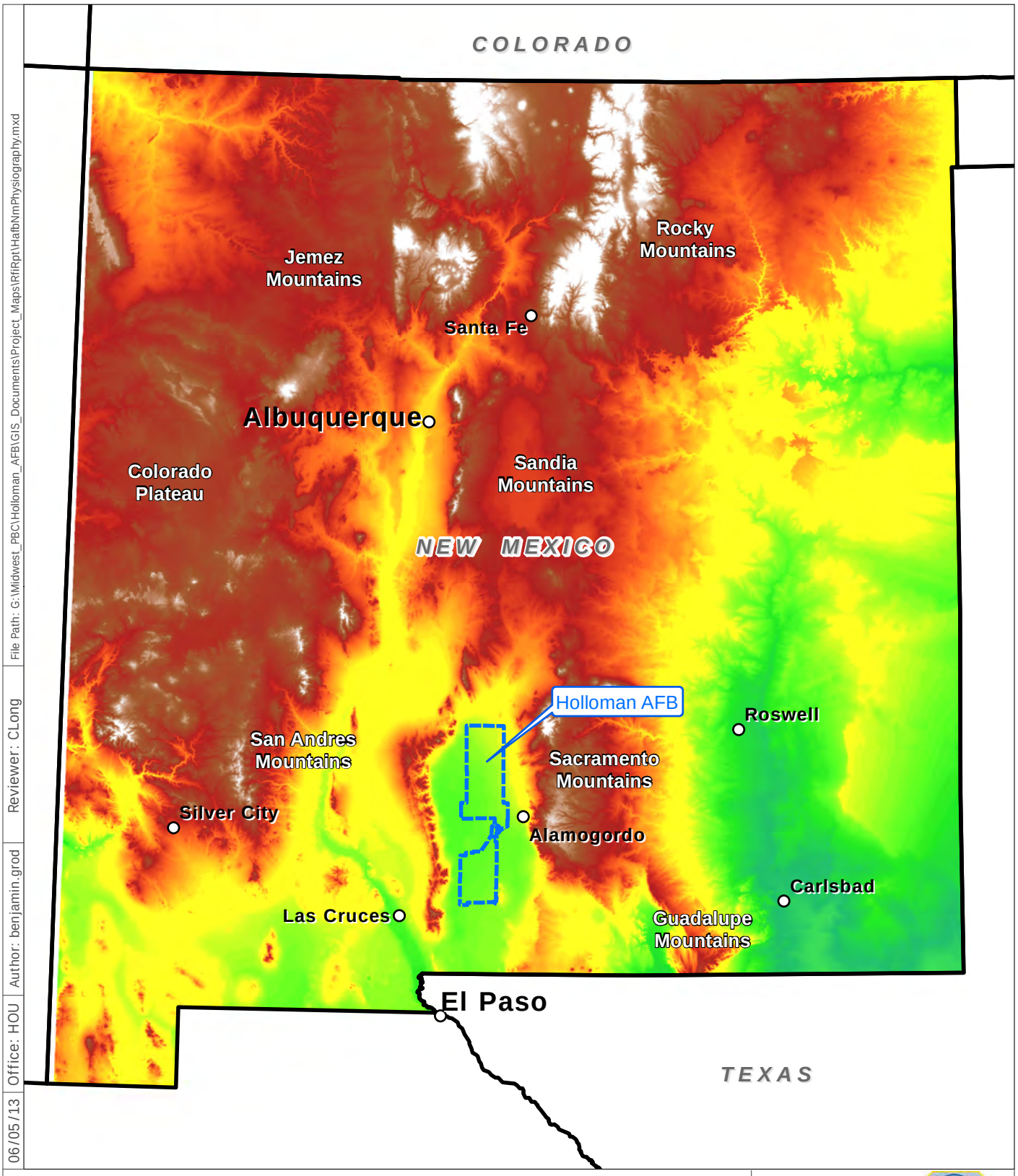


Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
Holloman AFB, NM



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Reviewer: CLong
Author: benjamin.grod
Office: HOU
06/05/13

Legend

Holloman Air Force Base (AFB) Installation Area

Elevation
- High : 3,936 meters
- Low : 0 meters

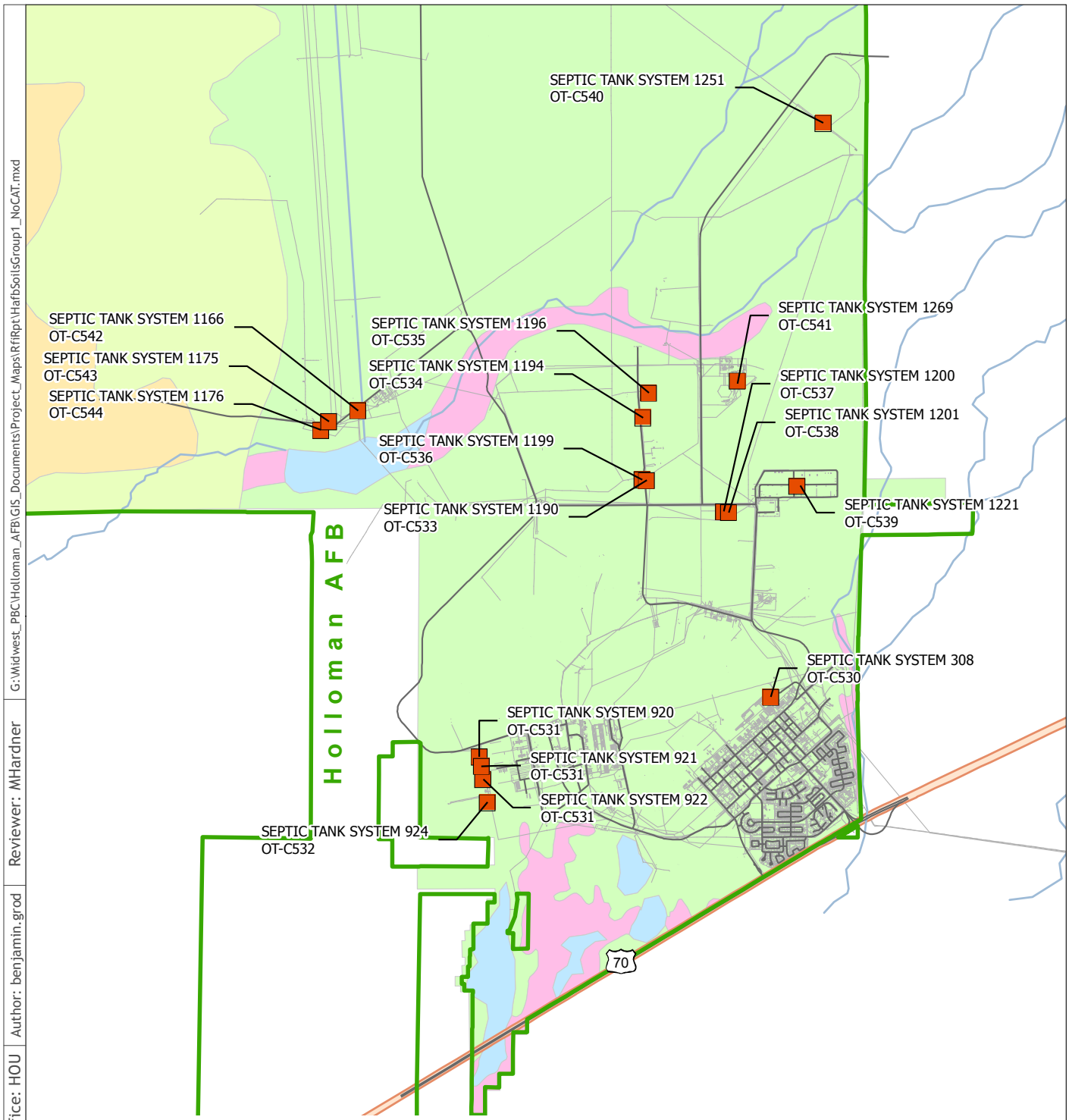
NAD 83 SPCS
New Mexico Central
Feet

0 50
Miles

Figure 2-1

Physiographic Map

Holloman AFB, New Mexico



Note:
1) Soils types at Holloman Air Force Base, New Mexico are based on United States Department of Agriculture (USDA) Soil Conservation Service Classifications. Source USDA, 1981

06/18/13 | Office: HOU | Author: benjamin.grod | Reviewer: MHardner | G:\Widwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbSoilsGroup1_NoCAT.mxd

Legend

- Installation Area
- Group 1 Septic Tank Sites
- Surface Water
- Active Dune Land Gypsum
- Duneland Yesum Association
- Holloman-Gypsum Land-Yesum complex
- Intermittent Water
- Mead Silty Clay Loam
- Rock Land Warm

NAD 83 SPCS
New Mexico Central
Feet

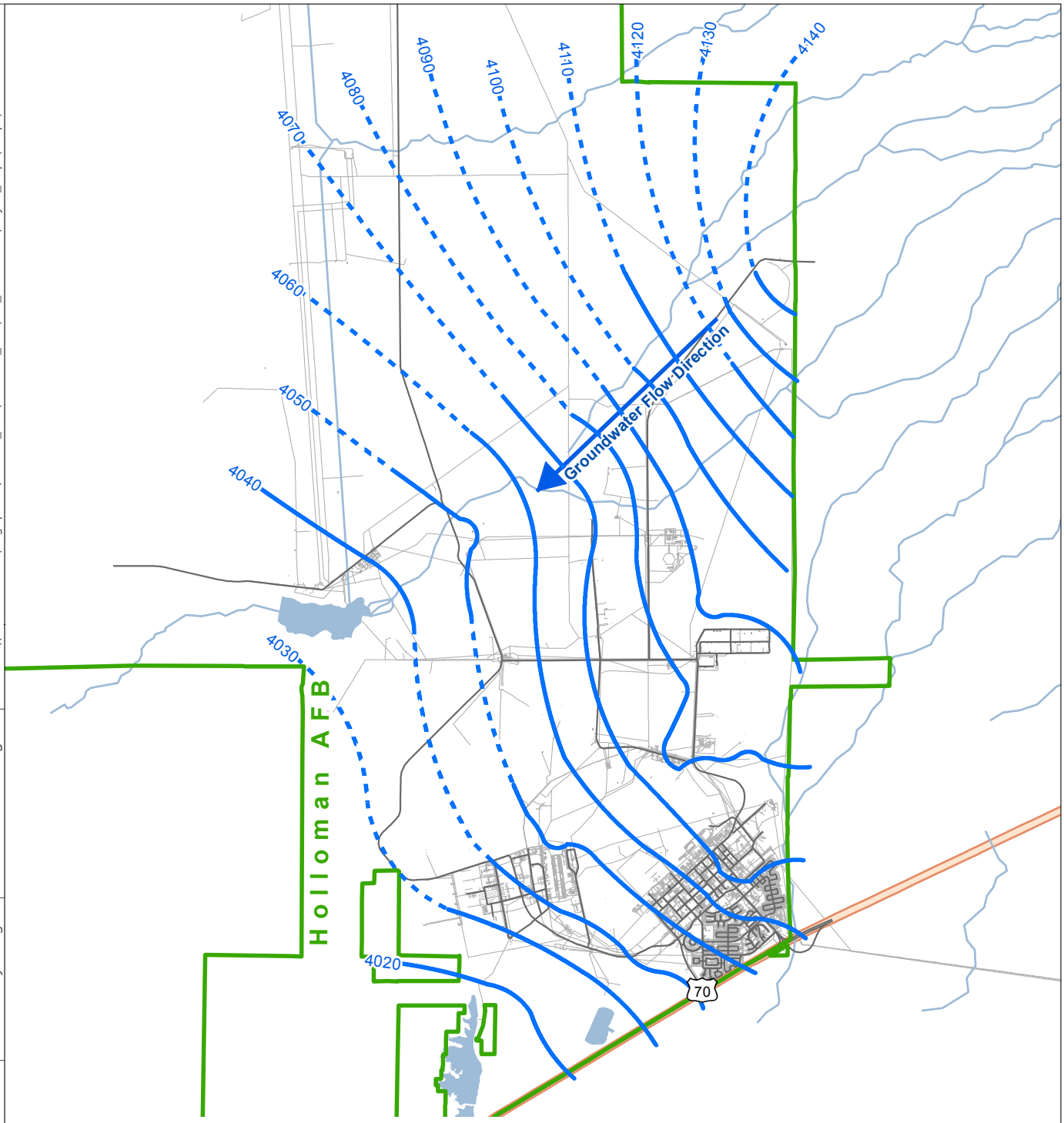
0 7,000
Feet

CBI

Figure 2-2

Septic Systems Soils Map

Holloman AFB, New Mexico



Note:
1) Groundwater contour map showing groundwater elevation contours across Holloman Air Force Base, New Mexico, are based on 2002 measurements taken from the shallow aquifer.
2) Source: Holloman AFB GIS, 2002 LTM.

08/28/13 | Office: HOU | Author: benjamin.grod | Reviewer: CLong | File Path: \\cfsfs01.cfs.com\arcgisprod2\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbGw2002.mxd

Legend

- Installation Area
- Groundwater Flow Direction
- Groundwater Elevation Contour (ft) (Dashed where inferred)
- Surface Water

NAD 83 SPCS
New Mexico Central
Feet

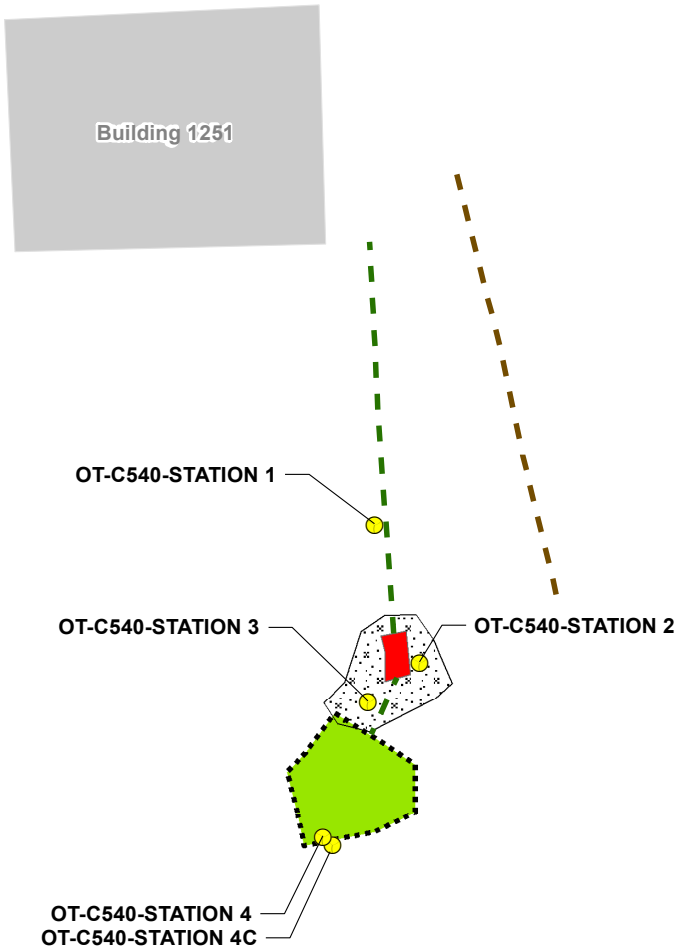
0 8,000
Feet

Figure 2-3

Regional Groundwater Contour Map

Holloman AFB, New Mexico

9/25/2013 | Office: HOU | Author: benjamin.grod | Reviewer: CLong | G:\Widwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\OTC540\OTC540_STS-1251_SiteLayout.mxd



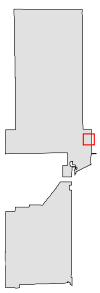
Legend

- Soil Boring Station
- Unknown Utility
- Influent Line
- Leach Field
- Septic Tank
- Soil and Rock Pile from Excavation
- Building

N

NAD 83 SPCS
New Mexico Central
Feet

0 10 20
Feet



CBI

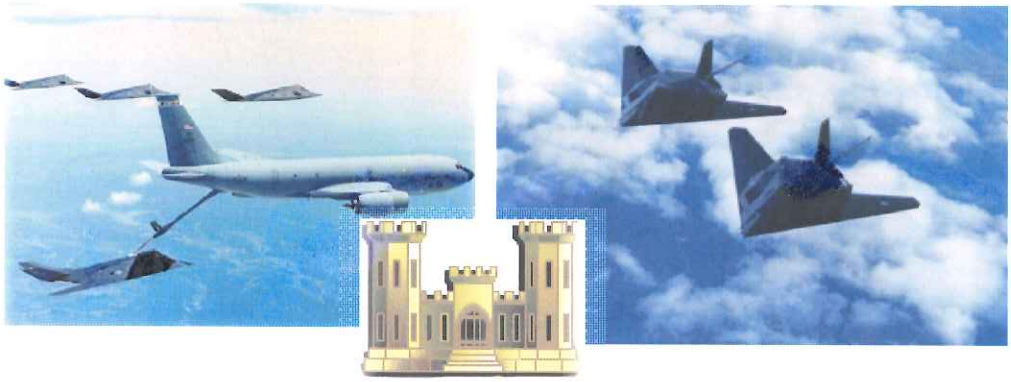
Figure 3-1

Site Layout and
Sampling Locations
Building 1251
Septic Tank System OT-C540

Holloman AFB, New Mexico

Appendix A
Historical Records

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS



Holloman Air Force Base
New Mexico

APRIL 2007

Headquarters, Air Combat Command
Langley Air Force Base, Virginia

49 CES/CEV
Holloman Air Force Base, New Mexico

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH FIGHTER WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

APR 27 2007

MEMORANDUM FOR NEW MEXICO ENVIRONMENT DEPARTMENT
Attn: Mr. James P. Bearzi
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe NM 87505-6303

FROM: 49 CES/CEV
550 Tabosa Ave.
Holloman AFB NM 88330-8458

SUBJECT: Submittal of Information Required by NMED Letter of August 30, 2006
Septic Tanks and Associated Drain Fields, Holloman AFB
EPA ID# NM6572124422

1. Pursuant to Part 4, Condition IV.B.3 of Permit No. NM6572124422, Holloman AFB is submitting the final portion of the required information.

2. This final portion of the required information covers the history of the facilities served by each septic tank and, based on the historic activities that occurred in each facility, the possible wastes that were discharged into the septic systems.

3. If you have any questions or comments, please contact Mr. Dave Griffin or Mr. George Fish at (505) 572-3931.

DEBORAH J. HARTELL
Chief, Environmental Flight

cc: w/Attachments
Mr. Cornelius Amindyas
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

Mr. David Strasser
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS
HISTORY

Holloman's records show a list of fifty seven (57) septic tank systems broken into three categories- Active Septic Systems, Inactive Septic Systems, and Removed Septic Systems. The systems are identified by the Building number they are/were attached to. There are twenty five (25) Active Septic Systems which are listed in this report. There are twenty one (21) Inactive Septic Systems that are listed and the history of activities in the building associated with the system is identified to the extent of available knowledge. There are eleven (11) Removed Septic Systems listed with histories based on available record knowledge.

The Active systems are identified, but no histories of the buildings are provided as this will likely change over time particularly with change in mission (aircraft on base) or tie-in to the base waste water treatment system. A history will be added to this list if and when the septic system is no longer needed and moved to the Inactive or Removed list.

The Inactive systems are scheduled for proper closure per guidance given in the NMED Liquid Waste Regulation 20.7.3.307 NMAC. This regulation calls for capping of the line(s) from the building to the septic tank, pumping out the tanks contents, penetration of the bottom of the tank, along with collapse of the tank roof and filling of the tank with sand or soil.

The septic systems on the Removed list have had the actual septic tank excavated and removed.

A search of Real Property records and the Historic Properties Inventory yielded the information available on the buildings. There was not information available on every building, but if new information becomes available, it will be added to the list.

Attachment 54a-e shows the current plan of where the sewer system lies to show what buildings are currently connected to Holloman's Sewer System. Any building that does not have an active septic tank is either abandoned or connect to Holloman's Sewer System.

ACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	149	1998		1000
2	312	1994		1000
3	375	1968		500
4	882			
5	864 (863)	1994	5'x8'x6'4"	750
6	885	1970	7'10"x4'8"x6'10"	1000
7	886			
8	887	1991		1000
9	923	1959	4'2"x7"x7'9.5"	1600
10	1022	1992		1200
11	1066	1994		1000
12	1160	1957	5'x12'4"x7'6"	1500
13	1161	1957		750
14	1162	1957		350
15	1163	1957		350
16	1169	1962		1680
17	1195	1962		1260
18	1256	1970	12'8"x4'8"x5'	
19	1270			
20	1271			
21	1278	2004		1250
22	1284			
23	1625			
24	75600	1989		1200
25	La Luz Gate (1290)(**1292**)	2004		1250

INACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	308	1965		
2	920	1959	4'2"x7"x7'9.5"	1600
3	921	1959	4'2"x7"x7'9.5"	1600
4	922	1959	4'2"x7"x7'9.5"	1600
5	924	1959	4'2"x7"x7'9.5"	1600
6	1091	1969	6'8"x3'x8'5"	
7	1097	1987	5'10"x5'x7'8"	1672
8	1190	1952	9'x4'x8'10"	3000
9	1194	1987	4'x4'x8'10"	1350
10	1196	1993	4'6"x11'x6'	1300
11	1199	1957		500
12	1200	1954	4'x8'x4'	1000
13	1201	1951	2'6"x6'6"x5'5"	650
14	1219	1985	5'4"x10'6"x8'4"	
15	1221	1983	4'8"x9'4"x6'2"	1100
16	1226	1985	5'6'2"x6'	
17	1235	1986		1189
18	1239	1977	4'6"x8'6"x6'	750
19	1250	1957		350
20	1251			
21	1269	1966	4'6"x9'	500

INACTIVE SEPTIC SYSTEMS

BUILDING 308

This is a 3200 SF building originally constructed in 1965. The original operation in the building was calibration of guided weapons for aircraft. In the 1970s and early 1980s the building was used as a nosedock for F-4 - Test Aircraft Radar electronic work area. It has never had a floor drain.
This facility is currently being used to store air craft support equipment for Building 309. The shop has been used in the past for servicing, inspecting, and repairing AGE equipment, but due to the reduction in personnel, this work is currently only performed in Building 309. The need to expand the work area for AGE equipment maintenance into Building 308 in the near future is not anticipated. A current view of the building is shown below in Figure 1.

Figure 1: Picture of Bldg. 308

Facilities associated with the septic system consist of:

- Toilet
- Lavatory
- Janitorial Sink

The building is located at 340 Delaware Ave. The point of contact for this building is Ms. Vicky Cruz and Mr. Adam Ferrara, they can be reached at 575-~~475~~-5272. The hours

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of operation for this building when it is in use is one 8.5 hr shift (0630-1500) and one 9 hr shift (1500-2400), five days per week.

Industrial Wastewater Drainage: There are no floor or trench drains in this facility. A janitor's sink is located in the restroom. The sanitary sewer pipe from the restroom connects with the pipe from the restrooms in Building in 309. The effluent pipe then proceeds south to Manhole 334E the layout of this facility can be seen below in **Figure 2**. At the time of the inspection surveyors were unable to open Manhole 334E. No cross-connections to the storm sewer were identified.

Industrial Wastewater Sources/Existing Pretreatment/ Existing Management Practices: There is only once source of industrial wastewater from this facility: floor washing

Floor Washing: The floor in this facility is washed every three months using a Tennant floor scrubber, 10 gallons of water and Simple Green. Average and maximum daily wastewater flows from this activity are estimated to be less than one gallon and ten gallons, respectively. The wastewater from this activity is discharged into the French drain at Building 309; therefore, the quantity of wastewater generated by this activity is included in the flow summary for Building 309.

Existing management practices consist of sweeping the floor prior to washing it.

Site Description: Aircraft Corrosion Control
Site Specific Contingency Action Plan: See Attachment 1
Secondary Containment Routes: None
Probable Spill Route: Leaks dissipate in local area on ground
Material Compatibility: No material incompatibilities

Connected to Sewer?

Stored Substances:

Chemical	Container Type
MEK	1 gallon can
Polyurethane Paint	1 gallon can
Naptha	1 gallon can
Toluene	1 gallon can
Epoxy Primer	1 gallon can
PD-680 Type II	55 gallon drum
Waste Paint/Thinners	55 gallon drum

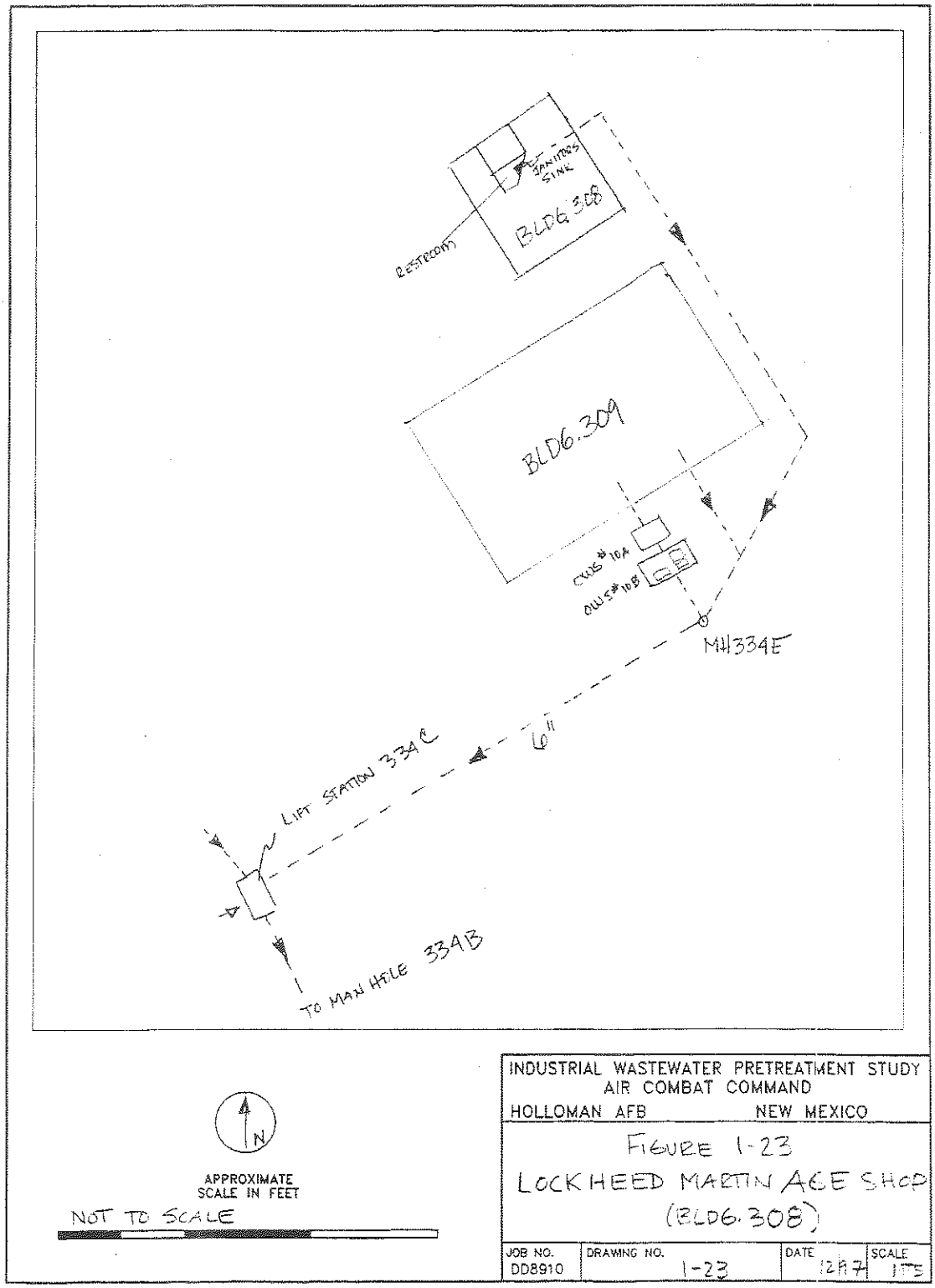

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Figure 2: Layout of Bldg. 308 and 309

INACTIVE SEPTIC SYSTEMS

BUILDINGS 920, 921, 922

These are three identical buildings constructed in 1959. Each building has 1900 SF. They were originally built for ammunition assembly which primarily consisted of bolting rocket components together prior to use. All three buildings are presently vacant and empty.
Each of the three buildings has a simple bathroom consisting of a:

- Toilet
- Lavatory

Multiple inspections were set up for this site, but no one showed up. Therefore, no follow-up information was found. Pictures of the current buildings are shown below in Figures 3-5.

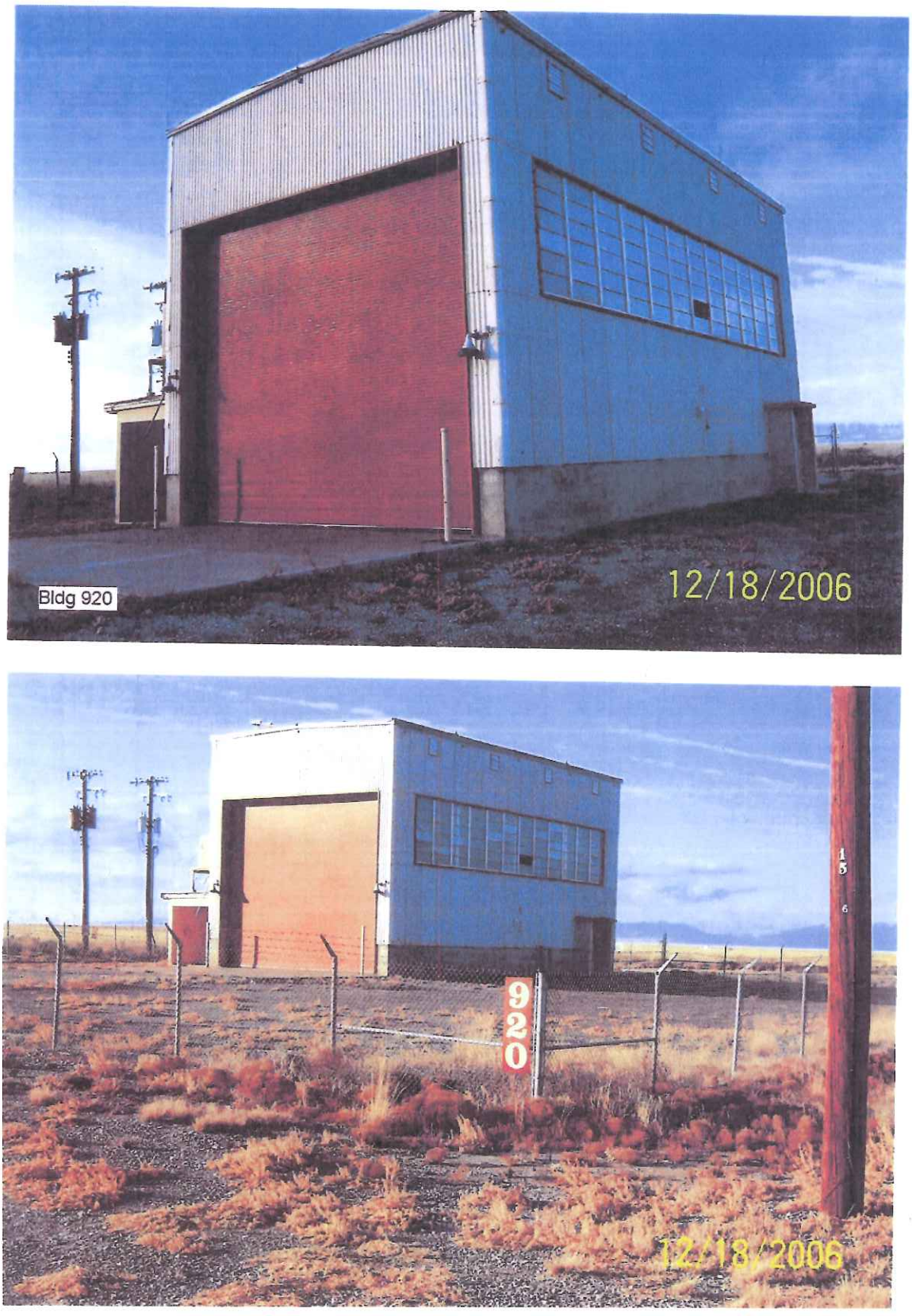


Figure 3: Pictures of Bldg. 920

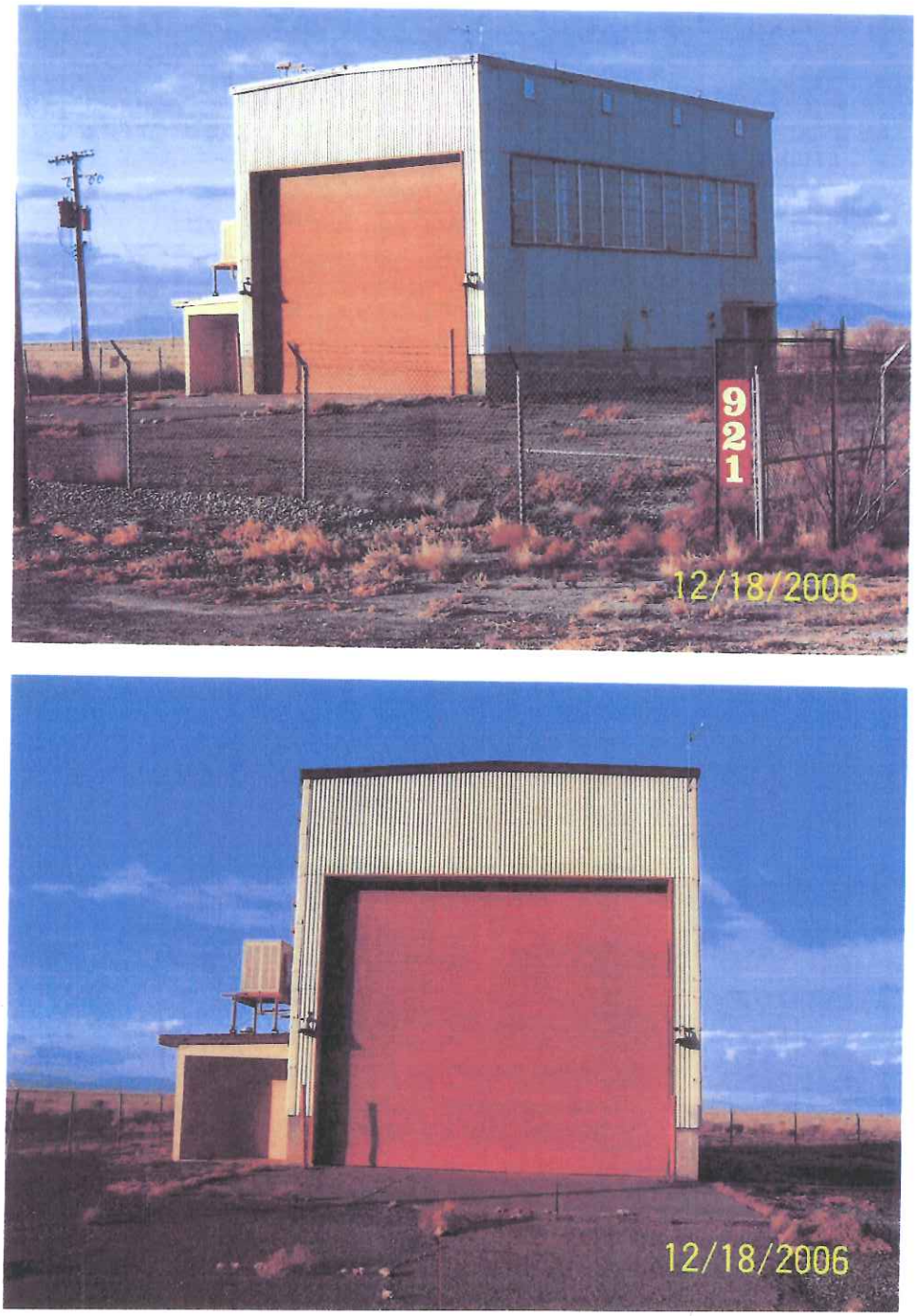


Figure 4: Pictures of Bldg. 921

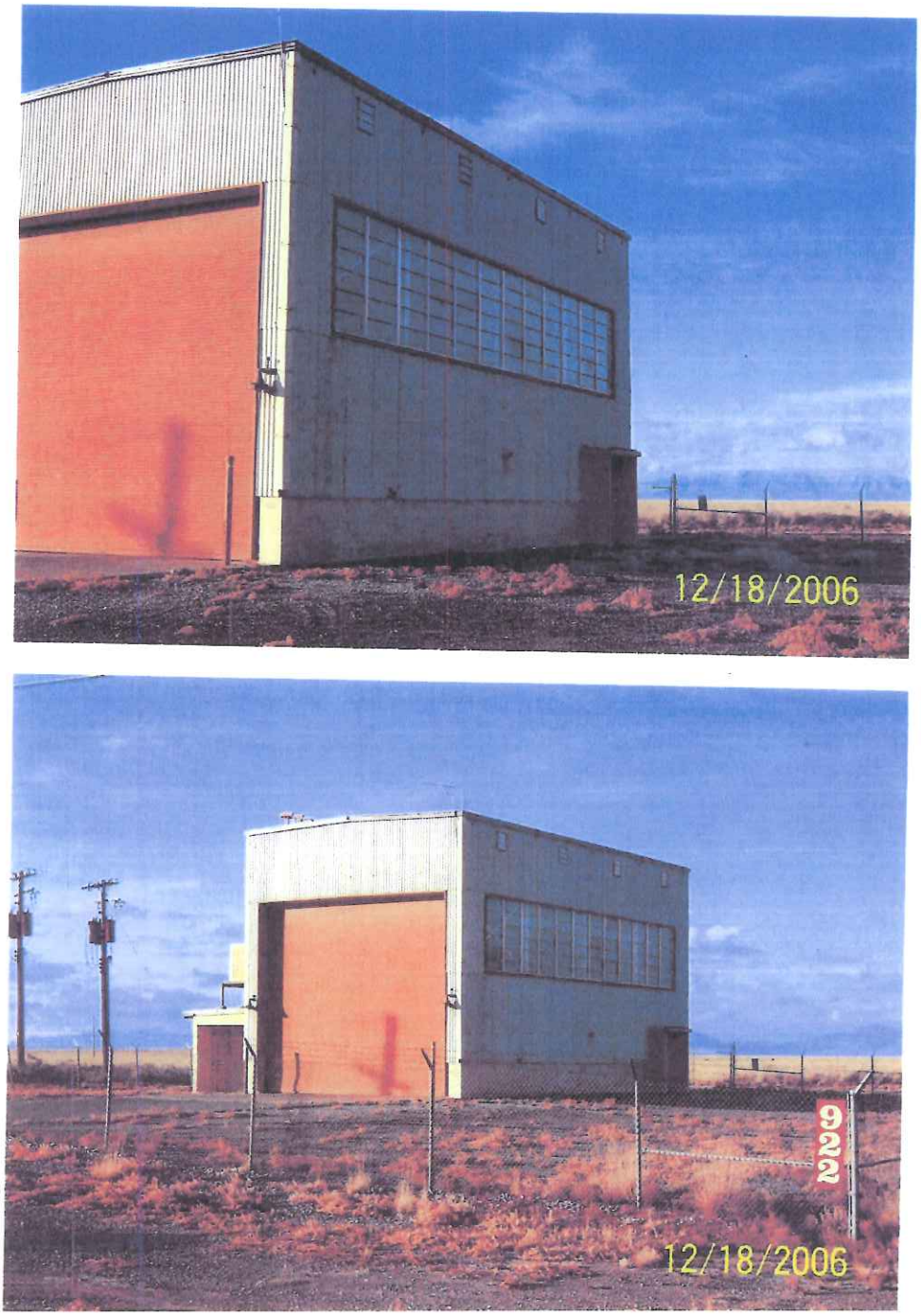


Figure 5: Pictures of Bldg. 922

INACTIVE SEPTIC SYSTEMS

BUILDING 924

This building was constructed in 1959 and has 4800 SF.
The building's original service was ammunition assembly similar to buildings 920-922.
It was later used for maintenance of radar tracking equipment.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

An on site inspection was done for this building on 20 Dec 2007 with the current facility manager, Mr. Michael Tackett. He did not have any information about the history of the septic tank system. Currently the building is being used for munitions storage. For the past two year it has stored rocket motors for the test track. From the on site inspection and drawings (Attachment 4-6) it can be seen that the bathroom drain is separate and there are no floor drains.

There are no pictures on file of this building.

INACTIVE SEPTIC SYSTEMS

BUILDING 1091

Site Description: There are no current files on this building because the building has been demolished. The building served as the Airfield Control Tower until replaced by the present Control Tower
On Attachment 55b a drawing of where the leach field was located in 1984 can be seen.
Grid Coordinates: J.9, 10.2
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: No secondary containment associated with underground storage tank
Probable Spill Route: Leakage from underground tank will contaminate water table in local vicinity

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 / UST

There were also three drawings that were discovered during the research stage of the project. The drawing (Attachment 7) shows the Septic Tank Details, Septic Tank Drain Field and the Drain Field Details.

INACTIVE SEPTIC SYSTEMS

BUILDING 1097

Specifications and history of this building are given in the following "Cold War Survey: Holloman Air Force Base". Along with this survey an on site inspection was done on 28 November 2007 with the current facility managers, A1C Clinton Bennett and TSgt Robert Edyburn. During the on site inspection it was discovered that the bathroom is separated from work area drains. In the past the building was used as a communications work center (office space) until 2005. There are no floor drains in the work area. It is currently being used as a houses base for a radio system network. There were also three drawings (Attachment 8-10) that were discovered in the investigation phase of the project. The drawings show the Materials Septic System, the Septic Tank Placement and Piping, the Latrine Plan, and the Mechanical Plumbing Plan.

Facilities in this building consist of:

- Toilet
- Urinal
- Lavatory

Description: Communications facility
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: None
Probable Spill Route: Leaks dissipate in local area on ground

Tank Location: South of facility
Fuel Flow – South/West

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 /AST
	500 gal each/ 1 /UST (Abandoned)

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Communications, Receiver.
Historic: Transmitter/Receiver.
Street Address: 1432 Sabre Road, HAFB, 88330-7842.

Building Number: 1097

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [ ] Minor [ ] Moderate [x] Major

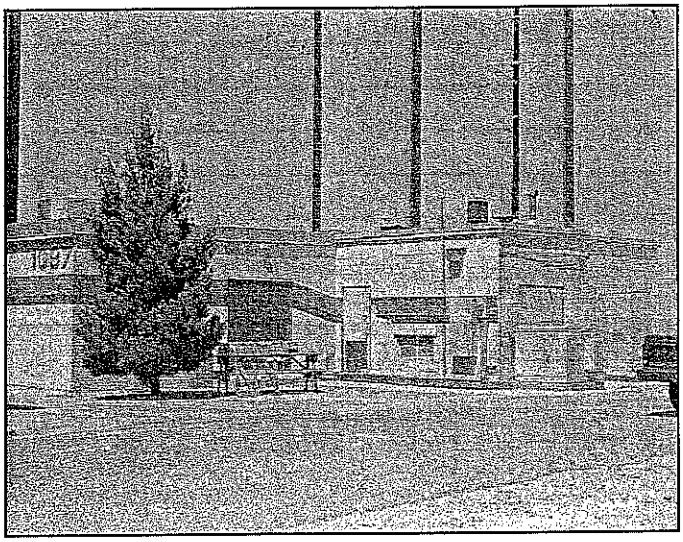
Comments:

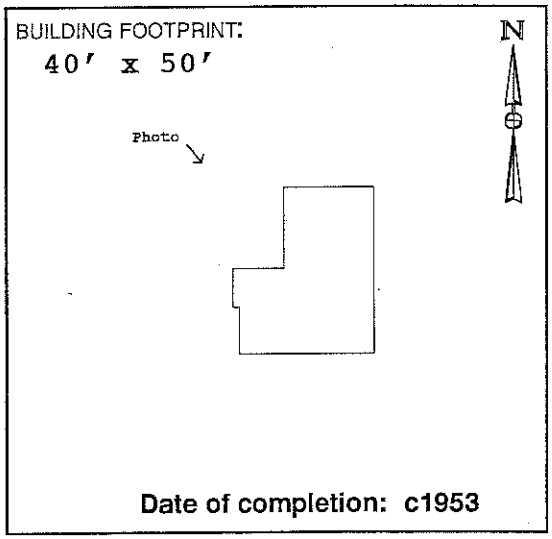
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1097 has not retained historic integrity.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1953

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1097 is a small transmitter building designed with few embellishments for utilitarian use only. Building 1097 originally had a rectangular footprint identical to Building 1098 and Building 1095. The original floor plan was sectioned into 4 rooms. An addition was constructed at the west elevation in 1986 using compatible structural and architectural components (CE File #1097-1). Both the builder and the architect are unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1097.

Current Function: Receiver/Air Traffic Control/Radio Control.

Original Function: Transmitter/Receiving/Communications.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1098-1 (c1952).

Foundation: Concrete wall footing. Concrete slab on granular fill.

Exterior walls: Painted concrete masonary units (CMU).

Roof: BUR on 2" rigid insul.; 2" poured gypsum on gyp board sup. by steel joists.

Notable interior features, including machinery:
Construction drawings document *"UHF Radio Air/Ground Facilities AN/GRC-27"*.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:
Continues to function as a communications facility/receiver site.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1097 has served as a Base communications facility since its completion c1953. Several renovations have resulted in a loss of historic integrity for this building. Building 1097 is no longer eligible for the National Register of Historic Places.

VII. ASSOCIATED BUILDINGS:

Location plan CE File #1098-2 identifies at least three north area transmitter sites. Building 1097 was associated with transmitter Building 1098. This facility is also associated with the flightline, and with communications Building 221.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building #1097 retains its original function as a radio receiver facility, however it has been modified to accommodate electrical, mechanical, and equipment additions and change-outs. Original equipment has been replaced.

Office space was added to the south elevation (1986: CE File #1097-1). All six windows at the north, east and west elevations have been blocked in. Original doors have been replaced. Vinyl floor tile covers original tile throughout. Dropped ceilings have been added.

This building, although retaining historic significance as a receiving site, has lost integrity of design, materials, workmanship, and association with its period of significance. Note: A Sgt. Boots (extension 3132) was identified by Building 1097 personnel as being a possible source for oral history research concerning specific activities associated with this facility.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Office space added to the west elevation (c1986: CE File #1097-1).

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Construction of adjacent buildings has altered viewshed.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Windows have been blocked in.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: An addition obscures the original west elevation. The original window treatments removed. Dropped ceilings added. Original asphalt floor tile covered.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: The presence of interior communications equipment and exterior poles contribute to the integrity of feeling as a radio site.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

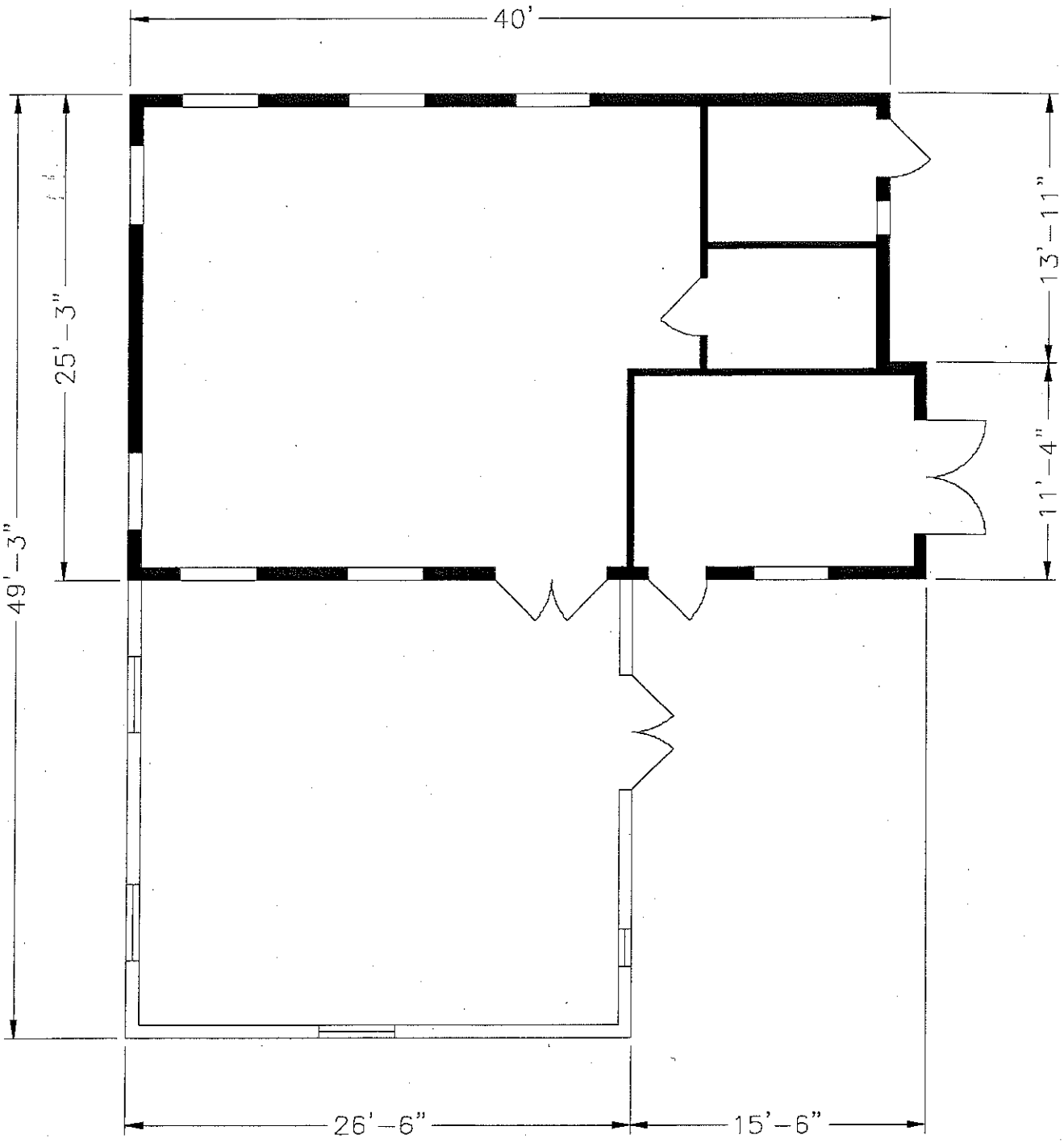
Comments: Original equipment has all been replaced.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #81**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



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Source: CE File #1098-2 (c1971)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1097** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1190

This building was constructed in 1952 and demolished in 2002. Specifications and history are provided in the "Cold War Survey".

The only drawing discovered was the plumbing floor plan and it can be seen in Attachment 11. Attachment 55d shows the current location of the leach field in 1984.

2002 Demolished Due To Unrelated Condition

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Security Police Building.
Historic: Change House/Unconventional Fuel Storage.
Street Address: 1514 Lethal Road, HAFB, 88330-7840.

Building Number: 1190

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1190 is in need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

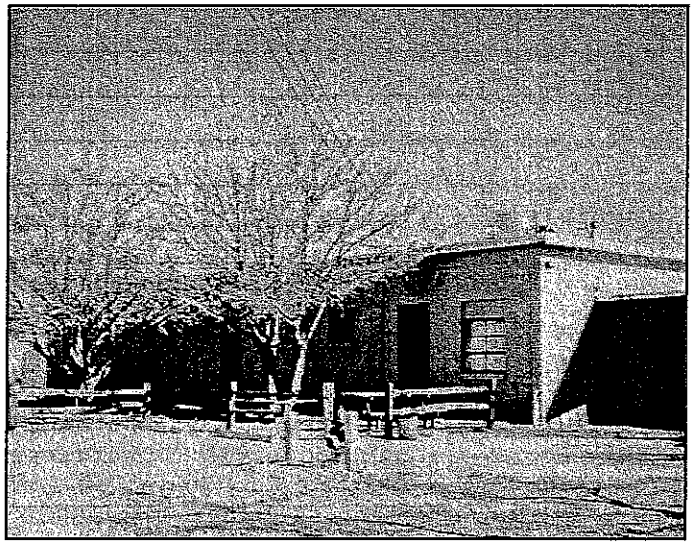
Comments: Interior partitions have been removed (date unknown).

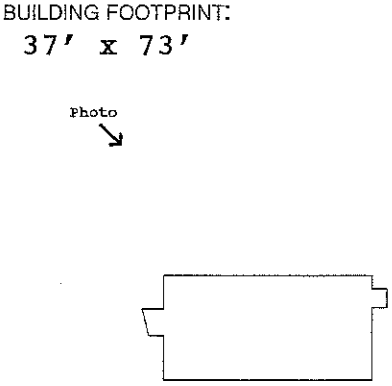
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1190 is a single-story, flat-roofed, concrete masonry unit (CMU) building exhibiting large roll-up equipment doors, numerous personnel access doors, and asymmetrical window fenestration. Construction drawings prepared in 1951 were stamped "As-built" but were not stamped in the revision block. Real Property Accountable Record/1190 indicates that Building 1190 was completed c1952 as a Change House for unconventional fuels personnel. W. C. Kruger Company (Santa Fe, NM) provided the construction drawings stored in CE File #1190. The builder is not known. A comparison of the current building and original blueprints reveals that no structural modifications to the building have occurred.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1190; CE File 1195-1 (c1951).

Current Function: Security Police operations.

Original Function: Change House, Unconventional Fuels.

Interim Functions: "RC Con House" (n.d.); "Prpln R-L Fuel/Lub" (n.d.); Prop Res Lab Rocket" (n.d.); "Prpln R-L Rkt" (n.d.); Sp Operations (n.d.).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1190-1 (c1951).

Foundation: Poured concrete footings and grade beams; concrete slab.

Exterior walls: Concrete masonry units (CMU).

Roof: (Built-up) gravel on rigid insul.; 2" slab sup. by metal lath and steel joists.

Notable interior features, including machinery: Shower stalls, locker room, dressing room, and laboratories.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

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VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Recommend reassessment of Building 1190 once the fifty-year construction date is met in the year 2002. This building retains historic integrity.

VII. ASSOCIATED BUILDINGS:

According to CE File #1190-1 *Title Sheet*, Unconventional Fuels Storage Building 1190 was associated with Building 1194 (Booster Inspection), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

This building retains all aspects of historic integrity. Although not meeting the "exceptional importance" standard imposed on buildings constructed within the last fifty years, Building 1190 remains potentially eligible as an individual property once the fifty-year date of construction is met in the year 2002. Recommend inclusion in a Multiple Property nomination along with the other unconventional fuels storage buildings. Building 1190 is currently being used as a storage and administrative facility by the 49th Squadron Security Police personnel. The original shower stalls, dressing room, locker room, shop, tools and supply rooms are all used for storage. Free-standing shelves have been installed to accommodate storage. As a result, some original doors and windows are blocked from view. Minor alterations have occurred at the interior. Two partitions have been removed. Glazed tile walls appear to have been added to at least one office. Vinyl tile has been installed over one section of the concrete slab in what once served as a machine shop. Some of the window panes have been painted. Because this facility remains potentially eligible, recommend that the original design features be considered in future modifications, and that photographs document any changes to the essential features. Suggested routine maintenance: Prune trees away from principal facade. Noticeable water damage warrants inspection of the roof. Replace broken window panes. Repair hole at exterior south elevation wall.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: Interior room layout as a Change House remains a key design element. This layout includes large open interior spaces, smaller labs/offices, and showers, dressing, and locker rooms used by unconventional fuels personnel.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Although no longer used as such, Building 1190 continues to be situated in the vicinity of other buildings historically associated with unconventional fuels testing and storage. This building appears to been recently landscaped.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two interior partitions removed. Glazed tile walls in office rather than CMU shown on original drawings.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Nearly all original workmanship remains visible, particularly at exterior.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Aside from the change in operations occurring here, Building 1190 remains essentially as it was originally constructed.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

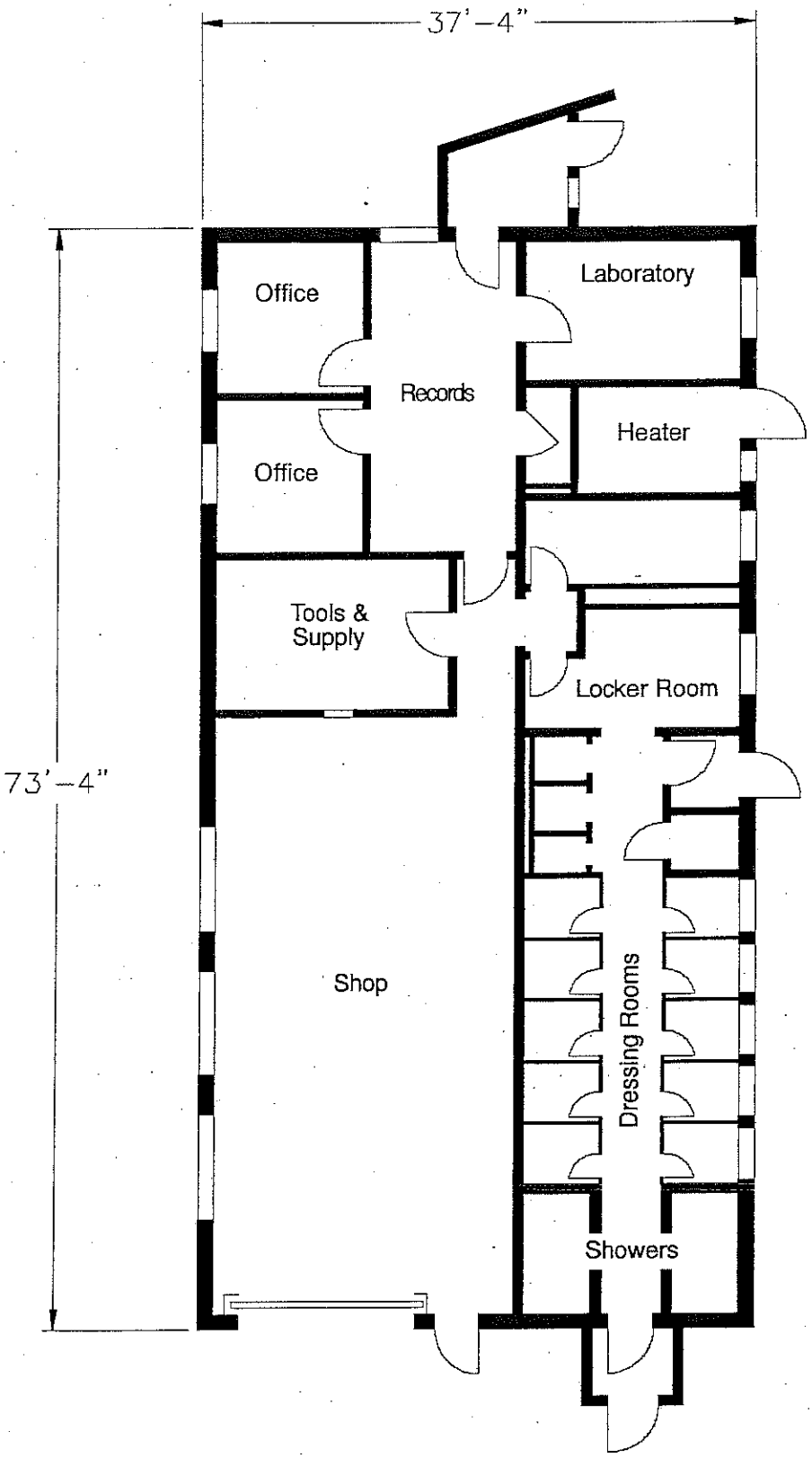
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #-Photo #**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1190-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1190** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Mike Gardner* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1194

Specifications and history are given in the "Cold War Survey".
Facilities in this building consist of:

- Toilet
- Lavatory

An on site inspection was done on 7 Jan 08 with the current facility manager, SSgt Joshua Roberts. In the inspection it was noted that the bathroom is separated from the work area drain. There was no history known. The building is currently being used for storage and it has been used for storage and has been used for storage for the past ten years.
Attachment 55d shows where the leach field for Bldg.1194 was located in 1984.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME: **Building Number:**

Current: Research Equipment Storage.

Historic: Booster Inspection/Unconventional Fuel.

Street Address: 1584 Lethal Rd., HAFB, 88330-7840. **1194**

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1194 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

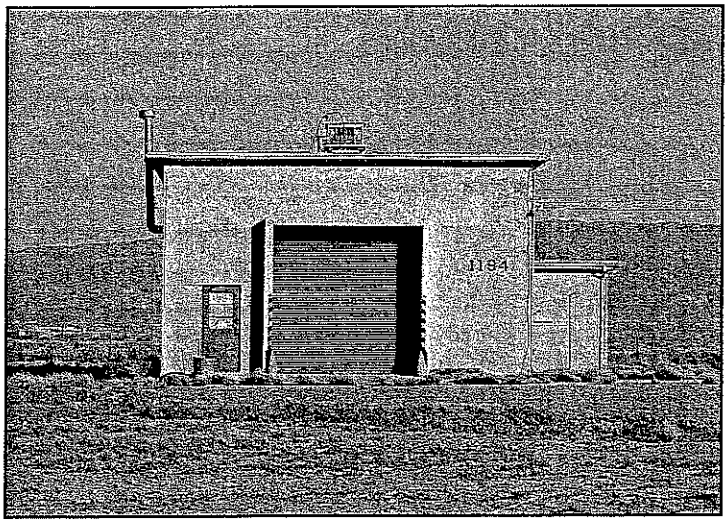
Comments: Interior partitioning is reversible.

Preliminary Determination of National or State Register Eligibility:

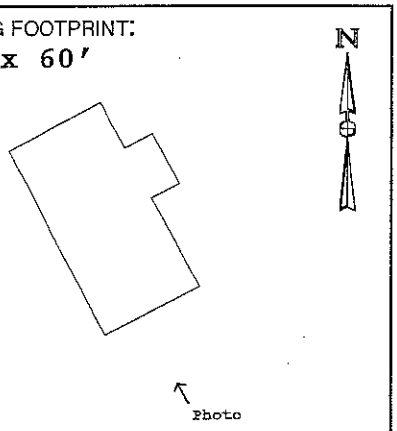
[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.



BUILDING FOOTPRINT:
30' x 60'



Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1194 is a rectangular, single-story, high bay structure made of concrete masonry units (CMU) and exhibiting a flat roof. The principal elevation faces west, showing one large roll-up door, and one personnel door. One row of windows is located below the eave line at the north and south elevations. The ceiling at the interior is exposed. "As-built" construction drawings show that Building 1194 was completed in 1952. W. C. Kruger Co. (Santa Fe, NM) provided the architectural work (1952: CE File 1194). The builder is unknown. No structural modifications to the original structure were noted.

III. HISTORIC AND CURRENT USE:

Current Function: Research equipment storage.

Original Function: Missile Assembly Test Building/Booster Inspection.

Interim Functions: "Mls/Space Rsch Tst" (n.d.); "M/Assembly Test Bldg" (n.d.); "Shp Wpn and Rlse Sys" (c1976); "BE Stor Cv Fclty" (n.d.); "Rsch Equip Stor" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1195-1 (c1952).

Foundation: Poured concrete footings and stem wall. Slab on compacted fill.

Exterior walls: CMU between concrete columns and bond beams.

Roof: BUR gravel. Rigid insulation. 2" concrete deck supported by steel joists.

Notable interior features, including machinery:

4-ton Wright Company chain-operated crane and hoist system, hoist no. 5197, serial no. 4925. The hoist is attached to a runway "I"-beam (crane) supported by steel support beams. Large metal roll-up doors at east and west elevations.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

210

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1194, although not meeting the "exceptional importance" standard, may be eligible for the National Register for its role in early Cold War materiel development once the fifty-year construction date is met in 2002.

VII. ASSOCIATED BUILDINGS:

According to CE File #1195-1 (c1951) *Title Sheet*, Building 1194 was associated with Building 1190 (Change House), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1194 remains essentially as it was constructed c1952. The original floor plan layout included one main room and an equipment room. A small area in the northwest corner of the main room has been partitioned. No documentation was found pertaining to this modification. This minor partitioning of the main room is reversible. This building is no longer associated with either missile assembly and test activities or unconventional fuels storage, and currently serves as an equipment storage room for the 6585th Test Group. Construction drawings (1956: CE File # 1194-1) show that an addition to this building was planned. There is no indication that this addition was ever built. Because this building retains historic integrity, and may be eligible for the National Register under Criteria A and/or C once the 50-year construction date is reached in the year 2002, recommend that future modifications take essential design features into account. Note: One isolated occurrence of prehistoric artifacts was noted on the grounds north of the building, including one white chert core, and one secondary chert flake.

Suggested routine maintenance: Scrape, prime, and paint the exterior. Replace downspouts. Prune landscape plantings away from foundation.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Construction drawings show plans for an addition to the north elevation (1956: CE File #1194-1). There is no evidence that this addition was ever built.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The high open-bay floor plan allowing the crane and hoist system, and the large metal equipment roll-up doors remain as key design elements.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Buildings 1193 and 1194 remain in an unmodified and isolated setting.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Nearly all of the historic materials used to construct this building remain visible.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two doors have been replaced. All windows appear to be original. Interior partitions at the northwest corner divide the original floor plan.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Although retaining its original open floor plan, this building is currently used for storage of modern equipment.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

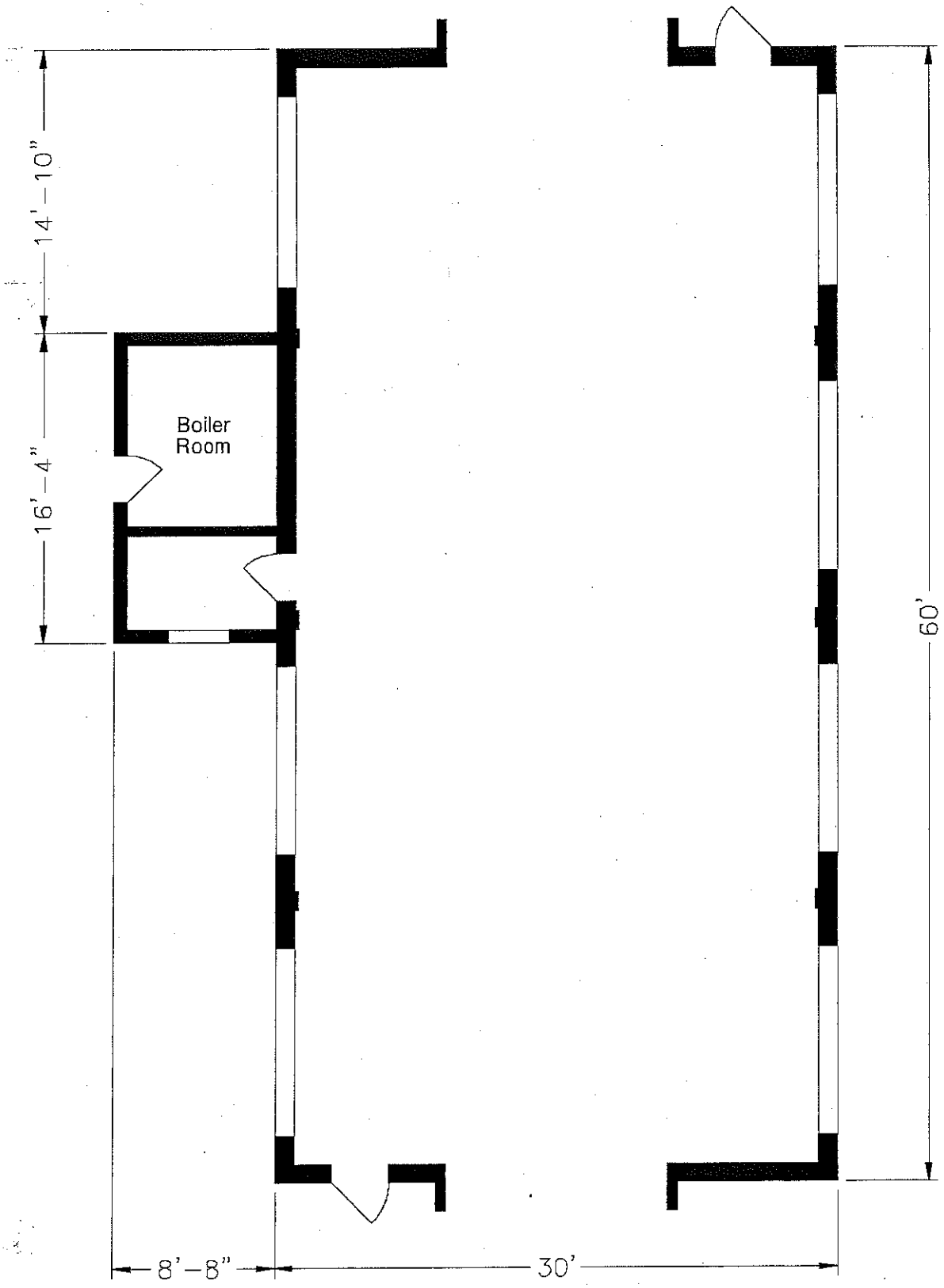
Comments: The open floor plan, isolated setting, hoist system, and nearby continuity check stand (Building 1193) contribute to this building's integrity of association.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #3-Photo #31**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1195-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1194** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1196

This building was constructed in 1956. It originally built for missile assembly, but is now in communications equipment storage.
The original facilities consisted of:

- Toilet
- Lavatory

These facilities were replaced in 1975 with:

- Toilet
- Urinal
- Lavatory

An on site inspection for this building was done on 4 Dec 07 with the current facility manager Sgt Lander. The information gathered from this inspection was that there were not any floor drains located within the building. In the past it was used for TAC can and for the past ten years it has been used for storage.
Attachment 55d shows where the leach field for Bldg. 1196 was located in 1984.

Figure 6: Picture of Bldg. 1196

INACTIVE SEPTIC SYSTEMS

BUILDING 1199

This building was constructed in 1957. It was originally built as a rocket fuel laboratory. In 1987 it was converted to the Security Forces Kennel.
As the fuels laboratory, it contained:

- Toilet
- Urinal
- Lavatory
- Shower

After conversion to the kennel, the facilities were changed to:

- Toilet
- Urinal
- Stainless Steel Sink

During the investigation stage of the project there were drawings found for building 1199. Attachment 12 and 13 are of the Site Plan, the Sewer Isometric, the Plumbing Plan and the Floor Plan.

Along with the drawings that were found an on site inspection was completed on 29 Nov 07 with the current facility manager, SSgt Gilmore. A new Security Forces Kennel area has been built and now the building is currently being used to house animals until they can be transferred to Alamogordo Animal Control.

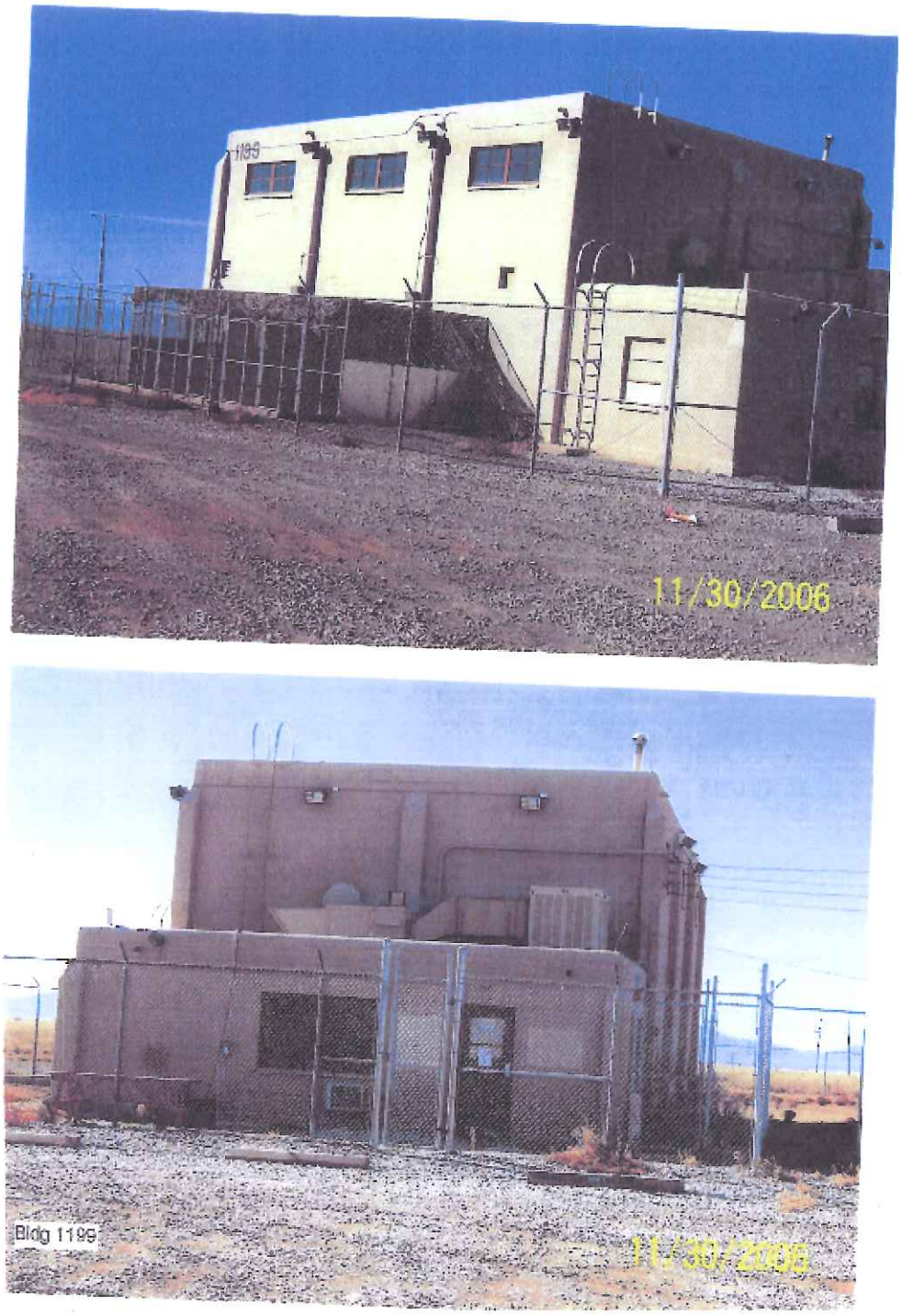


Figure 7: Pictures of Bldg 1199

INACTIVE SEPTIC SYSTEMS

BUILDING 1200

Specifications and History: See "Cold War Survey".

Three drawings were found for this building. These drawings show the Plumbing Floor Plan (Attachment 14), a Floor Plan (Attachment 15) and the Septic Tank and Drain Field (Attachment 16).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab, Medical (VACANT).
Historic: Space Biology Laboratory.
Street Address: 841 Douglas Road, HAFB, 88330-7823.

Building Number: 1200

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [ ] Needs maintenance [x] Deteriorated [ ] Archaeological

Comments: Building 1200 is abandoned, and showing signs of deterioration.

Degree of Alteration: [ ] None [ ] Minor [x] Moderate [ ] Major

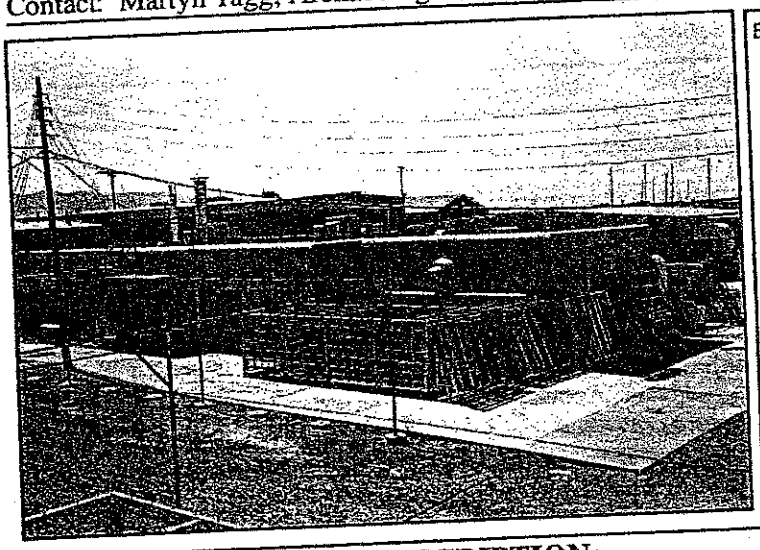
Comments: Alterations are architectural rather than structural.

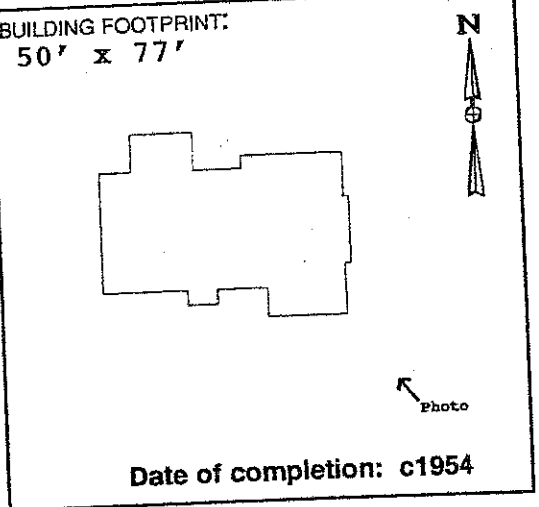
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1200 no longer retains historic integrity. See Section VI.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1954

273

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1200 is a rectangular, single-story, flat-roofed concrete masonry unit (CMU) building constructed as one of several laboratories dedicated to important aeromedical research using both animals and humans. None of the construction drawings were correctly stamped "As-built." According to Real Property Accountable Record/1200, the estimated date of construction is 1954. Subsequent improvements documented in CE File drawer #1200 include an addition to the medical lab (c1958), a covered passageway added to the boiler room (c1957), and a frame wall addition to the surgery room (c1957). Neither the builder nor the architect is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1200; Field visit Summer 1995.

Current Function: Vacant.

Original Function: Space Biology laboratory/Animal experimentation.

Interim Functions: Animal experimentation/Storage.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1200-1 (c1953).

Foundation: Concrete wall footings. Concrete slab on fill.

Exterior walls: Painted concrete masonry units (CMU).

Roof: BUR on concrete deck, supported by metal lathe and steel bar joists.

Notable interior features, including machinery:

Originally used as a medical laboratory, with work tables, work benches, built-in lockers, cabinets, operating tables, x-ray tables, etc.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:

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One room is currently being used for storage. All medical and laboratory equipment has been removed.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Due to extensive alterations to the exterior, Building 1200 no longer retains historic integrity. Recommend, however, that this building be considered as a contributing feature in a basewide early Cold War National Register of Historic Places Multiple Property nomination.

VII. ASSOCIATED BUILDINGS:

Building 1200 was an integral part of Holloman's aeromedical facilities, including Buildings 1201, 1202, 1203, 1204, 1205, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Since its original construction c1954, Building 1200 has been used as a laboratory and medical facility for a wide variety of research animals, including trout, black bear, dogs, mice, and chimpanzees. Although currently abandoned, this building featured a lead-lined x-ray room, an autopsy room, an observation room, a surgery room, a dark room, and animal pens (c1954: CE File #1200-1). Built-in steel lockers, metal cages, x-ray tables, work benches, food bins, operating tables, scrub sinks, surgical lamps, sterilizers, etc. have been removed. Two exterior doors have been blocked in, and thirteen exterior windows have been blocked in. One exterior door and one exterior window have been added. Interior walls have been added, removed, or relocated. A storage room has been added to the south elevation. Animal cages remain at the west elevation. The presence of dead rodents, foul odors, torn pipe and duct insulation (possible containing asbestos) and peeling paint (possible lead-based) represent hazards to health and safety. Because of the unique and important nature of the research conducted here, recommend that this building be nominated as a contributing feature as part of an HAFB early Cold War National Register Multiple Property nomination.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?
[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.
Comments: The building has been located at its present location since c1954.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?
[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact
Comments: Most of the original doors and windows have been removed. All of the equipment has been removed. Most of the original finishes have been obscured.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting
To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting
Comments: Continues to be situated in an isolated setting with the other Aeromedical facilities.

Materials: To what extent have the original materials used to construct this structure been retained?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Elevations have changed due to modified openings, an addition, and a covered passageway. Interior wainscot and cornice removed, wall tile added.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Exterior walls and cages remain intact. Some architectural features remain. Most of the original interior workmanship has been lost.

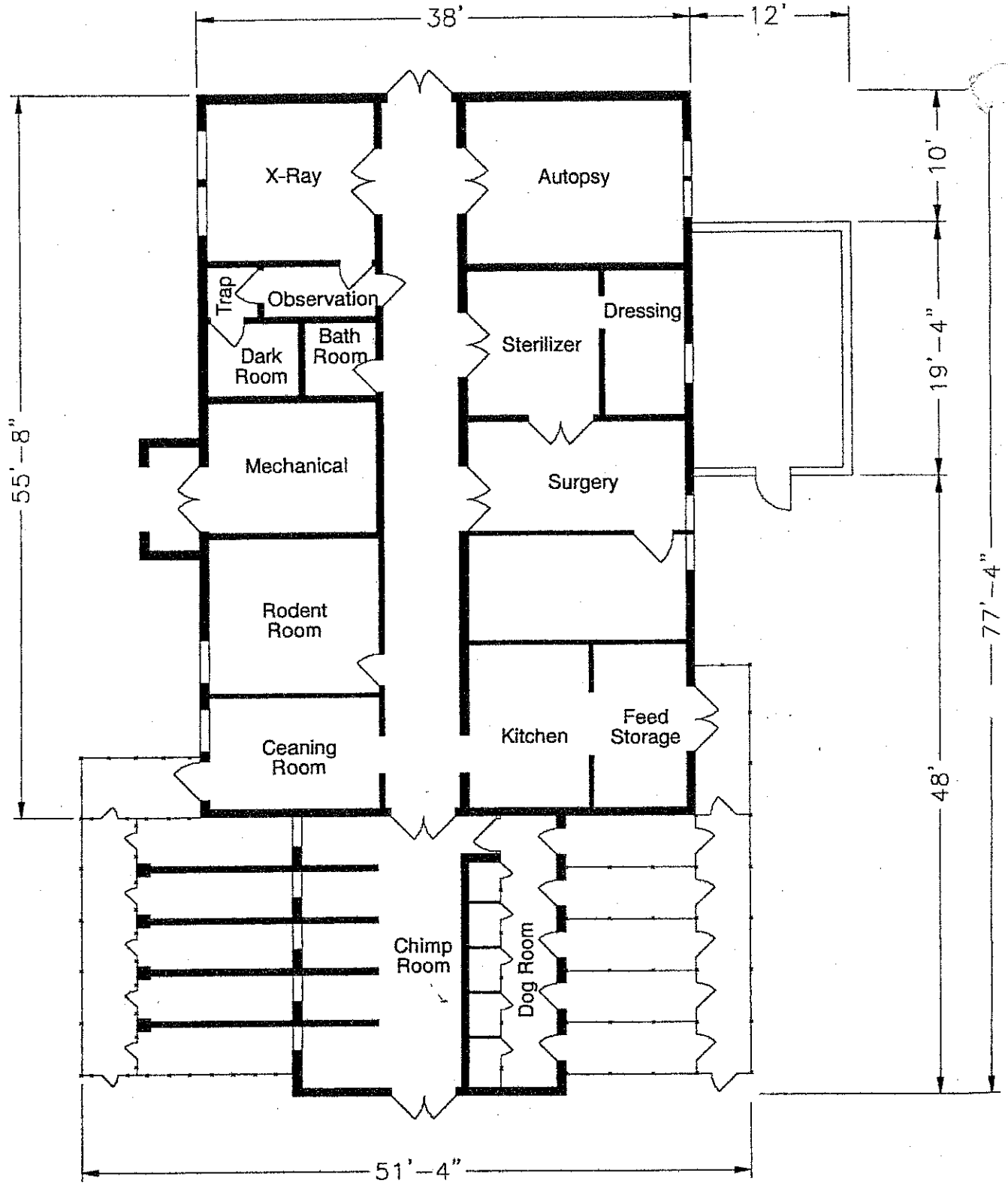
Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?
[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity
Comments: Building 1200 continues to be situated within the compound set aside for animal research. Chimpanzee research continues today in nearby buildings.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?
[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity
Comments: Although all of the equipment has been removed, this building still demonstrates a link with its past by virtue of its setting, the odors, and the animal cages.

X. FURTHER INFORMATION:

Surveyed By:
Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #94**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1200-1 (c1954)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1200** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

BUILDING 1201

Specifications and History: See "Cold War Survey"

Seven drawings were found for this building. These drawings show the Septic Tank and Absorbent Area Layout, Isometric Sewer Layout, Septic Tank Plan and Septic Tank Elevation (Attachment 17), Floor Plan (Attachment 18), Layout Plan (Attachment 19) and Systematic-Waste System (Attachment 20).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab Medical.
Historic: Aero. Medical Field Lab.
Street Address: 821 Douglas Road, HAFB, 88330-7823.

Building Number: 1201

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Structurally intact. In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

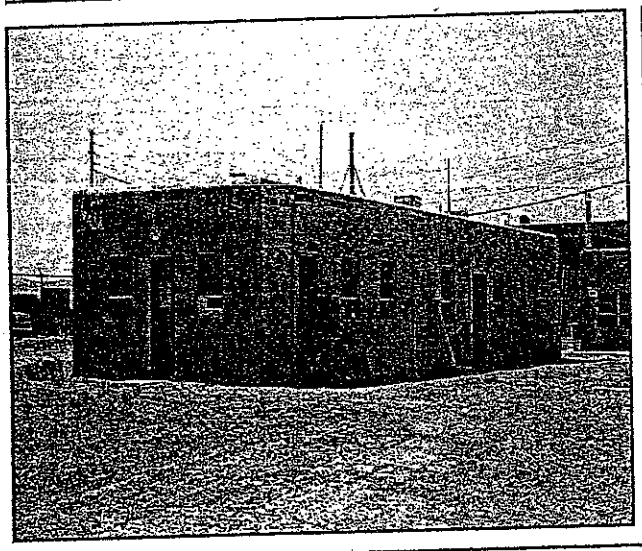
Comments: Mortuary/autopsy room added as subsequent improvement c1958.

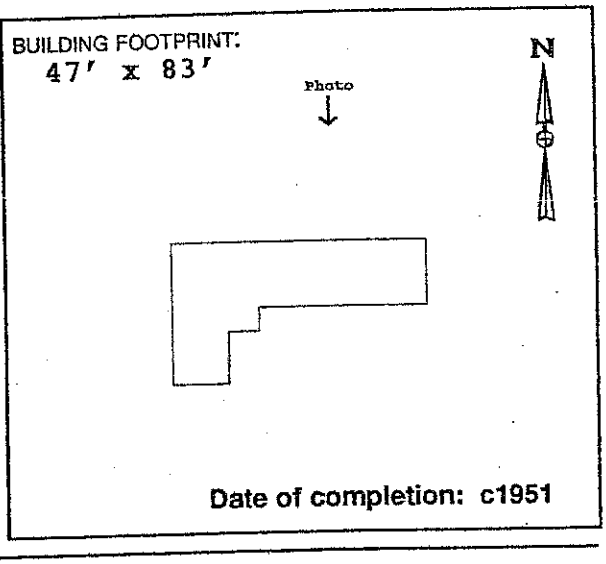
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible under Criteria A and/or C at a national level.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1951

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1201 is an "L-shaped", single-story, flat-roofed, building constructed primarily using painted 8" structural clay tile and exhibiting asymmetrical door and window placement. Animal cages occupy the west elevation. Real Property Accountable Record/1201 indicates that this science laboratory was constructed c1951. The construction drawings consulted were stamped "As-Built," although no date was given. Both the architect and builder are unknown.

At least two structural modifications may be viewed as subsequent improvements to the original building, including the addition of a Mortuary/ Autopsy Room (c1958: CE File #1201-4), and the addition of a rooftop observation deck (c1952: CE File #1201-5).

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1201.

Current Function: Carpentry shop; Employee break room; Office space.

Original Function: Aerospace Medical Lab; Animal experimentation.

Interim Functions: "SC Lab Human Eng" (n.d.); "SC Lab Med (c1968).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1201-1 (c1951).

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted structural clay tile.

Roof: Built-up roof w/ gravel on sheeting, supported by 2x12 wood joists.

Notable interior features, including machinery:

Fixed chain link cages, lab tables, equipment tables, work tables, wood storage bins, sterilizer, incubator.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL: (Based on field visit Summer 1995

[c1958 SUBSEQUENT IMPROVEMENT--MORTUARY/AUTOPSY]:

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted cement masonry unit (CMU).

Roof: 5-Ply built up roof on concrete slab. Steel joists.

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Notable interior features, including machinery:

Washer and dryer, kitchenette, tool room, table saw, furniture, lockers.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1201 is eligible to the National Register under Criteria A and/or C at a national level of significance for its vital role in early aeromedical research in support of the early Cold War space exploration mission.

VII. ASSOCIATED BUILDINGS:

Building 1201 was associated with the other Aeromedical facilities, including Buildings 1200, 1202, 1203, 1204, 1205, 1206, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1201 retains historic integrity as far as the structure itself goes. Very little physical evidence remains of this structure's original use as an animal laboratory. The cages have been removed. Two interior walls with doors have been added. One interior wall has been removed. Service sinks, work tables, wooden bins, an incubator, and other lab support items shown on c1951 construction drawings have been removed. An area of the original roof approx. 10' x 13' was reinforced with three inches of concrete for observation deck c1952 (CE File #1201-5). A mortuary/autopsy room was added c1958. These additions may be viewed as early improvements, and do not diminish Building 1201's historic integrity. Drawings itemize a "2-body" mortuary room, an autopsy table, a band saw, cabinets, a sterilizer, a photography area, and other laboratory equipment. This equipment has been removed. This room currently serves as a lounge area for employees. Due to the important research conducted here in support of this nation's space program, further research is warranted. Recommend that Building 1201 be included in a Cold War-era Multiple Property nomination. Suggested routine maintenance: This building is showing the signs of long-term neglect. Fill the stress cracks at the exterior corners. Scrape and paint exterior walls. Replace window glass and door hardware as needed.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Continues to be situated in an isolated compound.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Original structure essentially intact. Interior lab equipment and cages removed.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Enclosed by chain link fence topped with barbed wire, along with other research facilities. Chimpanzee research continues in nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Clay tile walls still intact. Some glass block windows remain. Some glass block windows blocked in when addition constructed. Floor tiles removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Roof, walls, and exterior openings remain essentially the same. The east elevation changed due to an early addition. Interior partitions, openings, and finishes have changed.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Historic photographs show that the natural, historic, and aesthetic character of Building 1201 has been retained.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

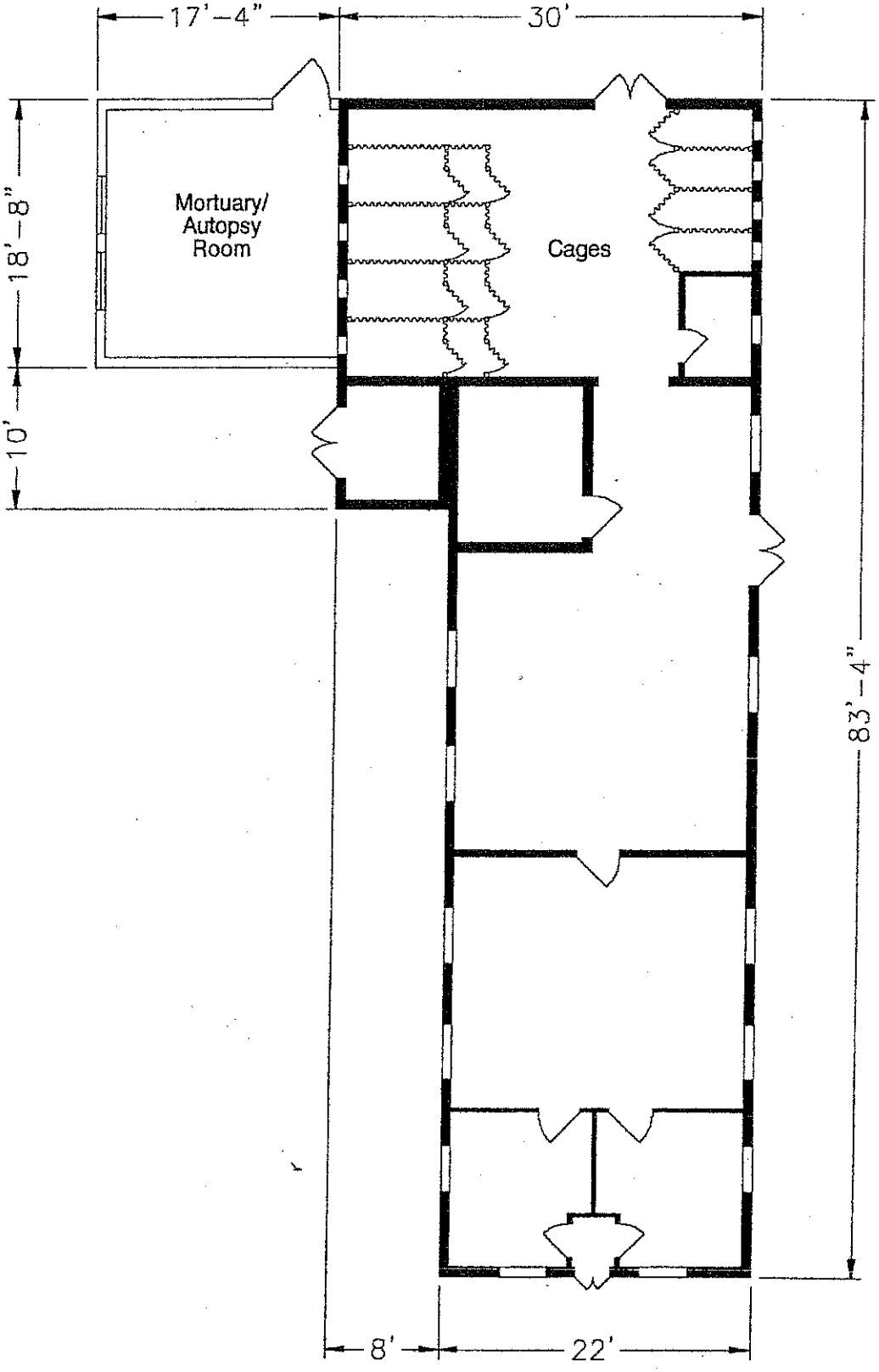
Comments: Building 1201 retains a visible link with its period of significance.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #91**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1995**



280

Source: CE File #1201-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1201** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

Buildings 1219, 1221, 1235 and 1239
An on site inspection was completed on 20 Dec 07 with the current facilities manager, TSgt Pote, he has been the facilities manager for the past nine years. During the inspection it was discovered that there are sink holes on all leach fields in the compound. All buildings in this compound have separate drains for the bathrooms. All buildings are also currently connect to the base sewer system.
Attachment 55d shows the leach field location for Buildings 1219, 1221, 1235 and 1239.

BUILDING 1219

This building is the Administrative Offices for the Munitions Maintenance Squadron. It was constructed in 1985 and covers 4476 SF.
There are Men's and Women's Bathrooms that discharged into two (2) septic tanks prior to the installation of a sewer main that discharges to the Base Waste Water Treatment Plant.

INACTIVE SEPTIC SYSTEMS

Building 1221

This building is in the Ammo Depot and was originally constructed for ammunition storage. It was later switched to store inert munitions.
The building was constructed in 1983 and covers 2857 SF.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan (Attachment 21), Floor Plan (Attachment 22), Partial Plan (Attachment 23), Septic Tank Details and Sewage Disposal System (Attachment 24) and a Profile of Sewer Line Septic Tank and Disposal Field (Attachment 25).

INACTIVE SEPTIC SYSTEMS

BUILDING 1226

This is a munitions maintenance shop building constructed in 1985. It has 2945 SF of floor space.
Facilities installed include:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Utilities Plan (Attachment 26), Plumbing Demolition Plan (Attachment 27), Plumbing and HVAC Plan (Attachment 28) and Waster/Water Piping Detail (Attachment 29).

In Figure 8 on the following page it can clearly be seen where the leach field is in relation to where building 1226. This is the leach field for building 1219, 1221, 1235 and 1239 as well. In Attachment 46 (a map showing many of the building on Holloman AFB) it can be seen where building 1226 is in relation to these building.

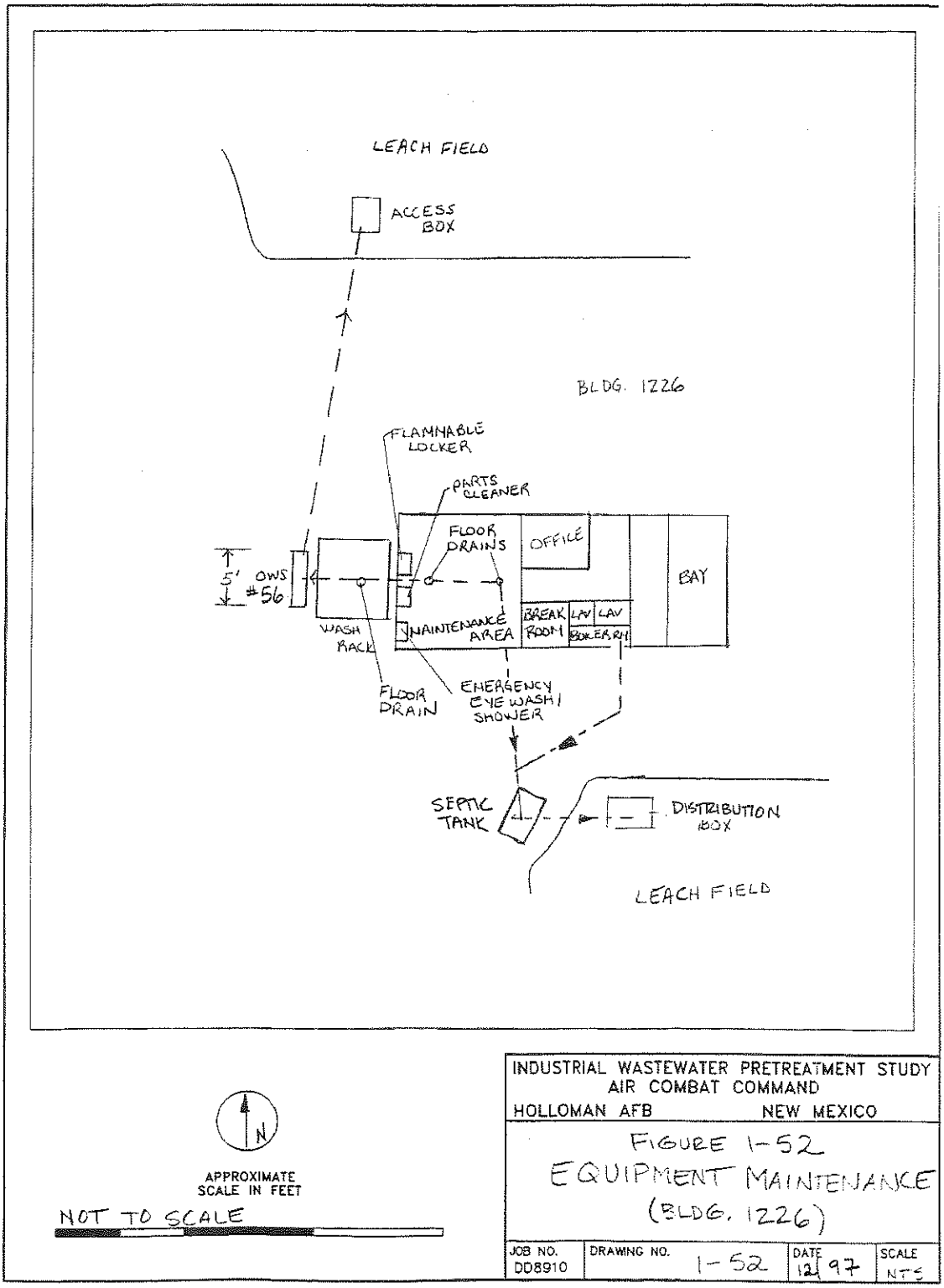


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Figure 8: Drawing of Leach field

INACTIVE SEPTIC SYSTEMS

BUILDING 1235

This building was constructed in 1964 and contains 3000 SF of floor space.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, a drawing for this building was also located. This drawing (Attachment 30) shows the Site Plan, Septic Tank Details and Sewer Clean Out.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST

INACTIVE SEPTIC SYSTEMS

BUILDING 1239

This is another building in the Ammo Depot. It was constructed in 1971 and contains 1920 SF.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Urinal
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan, Septic Tank Details, Utility Plan (Attachment 31), Floor Plan (Attachment 32), Grading Plan (Attachment 33) and Lavatory Detail (Attachment 34).

INACTIVE SEPTIC SYSTEMS

BUILDING 1250

This building was constructed in 1957 and contains 2890 SF.
It was originally a water pumping station. In 1985 it was changed into a storage facility. As part of the change in service the bathroom facilities were removed. Currently it has a large infestation of vectors and it is unsafe to go inside. The POC for this building is Mr. Chuck Price.
The original facilities consisted of:

- Toilet
- Lavatory
- Floor drains for the water pumps

INACTIVE SEPTIC SYSTEMS

BUILDING 1251

This building was constructed in 1965 and contains 1300 SF.
In the records it is listed as a Research and Testing Shop. It currently has a large infestation of vectors, therefore it is not safe to go inside. The building has been vacant since the mid 90's. The point of contact for this building is Mrs. Eisele.
It contains the following facilities:

- Toilet
- Lavatory

INACTIVE SEPTIC SYSTEMS

BUILDING 1269

This building was constructed in 1966 and contains 3262 SF.
The original service was a Medical Science Laboratory. It has been relegated to a storage facility.
The facilities consisted of:

- Toilet
- Lavatory
- Kitchen Sink with Garbage Disposal

Site Specific Contingency Plan: See Attachment 1

Max. Spill Quantity (gal): 55

Chemical	Container Type
Benzene	NA
Acetonitrile	

REMOVED SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	1102	1952	6'x4'x8'10"	2500
2	1103	1948	7'x9'x3'2"	1412
3	1108	1958	6'x9'6"x6'3"	750
4	1119			
5	1150	1953	4'x9'x6'3"	2500
6	1154			
7	1166	1960		450
8	1175	1949	5'1"x10'4"x6'10"	2970
9	1176	1959		640
10	1265	1992		1200
11	1173			

REMOVED SEPTIC SYSTEMS

BUILDING 1102

Specifications and History: See "Cold War Survey." More information can be seen in the drawings. The drawings that have been found for this building are as follows the Grading Plan (Attachment 35), Septic Tank Details and Boring Log Results (Attachment 36), Leaching Well and Cover Details and Sewer Clean Out (Attachment 37).

Attachment 55c shows where the leach field was located for this building in 1984.

This building has the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Missile Radar Station.
Historic: Radar Triangulation: King I.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1102

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

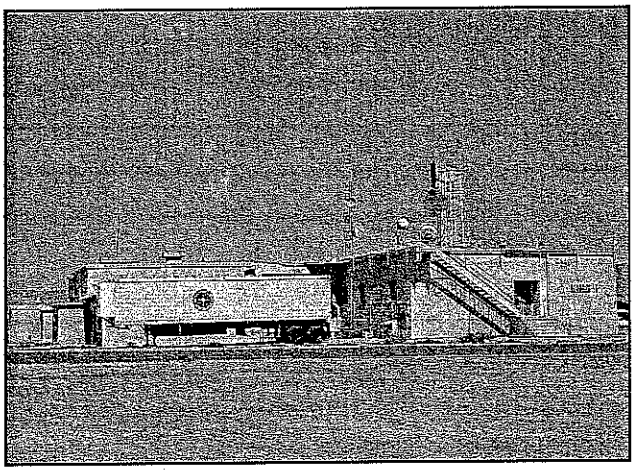
Comments: Essential structural and architectural features remain intact.

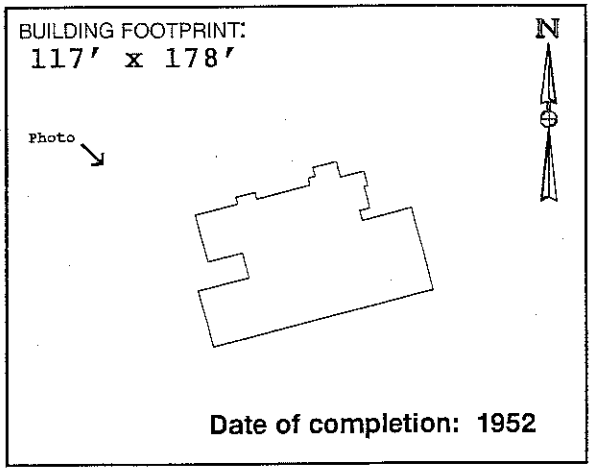
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Recommend listing as part of a Cold War Multiple Property.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1102 is a one-story concrete masonry unit, multi-shaped building with a central corridor running east-west the entire length and single rooms flanking both sides of the corridor. Original footprint shows primarily rectangular shape with a central projecting core. This core is a large open room with an upper balcony around its perimeter. Construction of the original building was completed in 1952, according to "As-built" drawings in CE File #1102-1. Surveillance display room added in 1969 (CE File #1102-1). It is unclear when north elevation additions constructed, although information in Real Property Accountable Record/1102 date the additions as being post-1970. The architect for this project was W. C. Kruger (Santa Fe, NM). The builder is unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1102.

Current Function: Telemetry and Optics. Altitude measurements.

Original Function: Missile Instrumentation Station; Mission Control.

Interim Functions: Missile Radar Station.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1102-1 (c1952).

Foundation: Concrete footing and foundation wall. Column spread footing.

Exterior walls: Concrete masonry units (CMU).

Roof: Bituminous concrete over built-up roof, ltweight concrete, supported by one-way concrete slab using concrete beams and steel beams encased in concrete.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

380

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Eligible under Criteria A and/or C at a national level of significance for important role in early Cold War-era missile and High Speed Test Track mission control and tracking. Further research recommended.

VII. ASSOCIATED BUILDINGS:

Building 1102 supported all missions at White Sands Missile Range and at Holloman Air Force Base until Building 300 and possibly 1527 at White Sands were constructed.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1102 continues to operate as a mission control building, with mostly optics and telemetry functions. The Flight and Instrument Control Room, and the Surveillance Radar rooms are vacant. Originally, missiles were fired using an analog boards (mechanical) system. When operations changed to a digital system in c1978, support moved from the central instrument control room to the north addition off of this room. Nearly all of the original interior finishes remain unchanged.

Suggested routine maintenance: Scrape, prime, and paint all block and concrete surfaces. Remove vegetation and rusted pipes by gas meter. Fill depressions at foundation, and regrade using gravel to promote positive drainage. Fill holes at concrete stoops. Replace wood bumper at dock using similar-sized lumber. Secure panel covers on abandoned electrical panels. Enclose live connections in junction boxes. Scrape, prime, and paint metal stairs. Reattach stair nose treads. Remove miscellaneous debris from building perimeter.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Still situated at the northeast corner of the intersection of Tula Peak Road, and Douglas Road.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The original floor plan remains intact.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Continues to be situated at the intersection of two roads in an isolated setting with few nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Most all original materials have been retained at both the exterior and the interior.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: All original exterior and interior room finishes remain visible. At the south elevation, one window is blocked, one window has been replaced with a door, and the door at the loading dock has been replaced. Most of the north elevation is obscured by the addition of an operations room.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1102 continues to support limited mission control operations.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

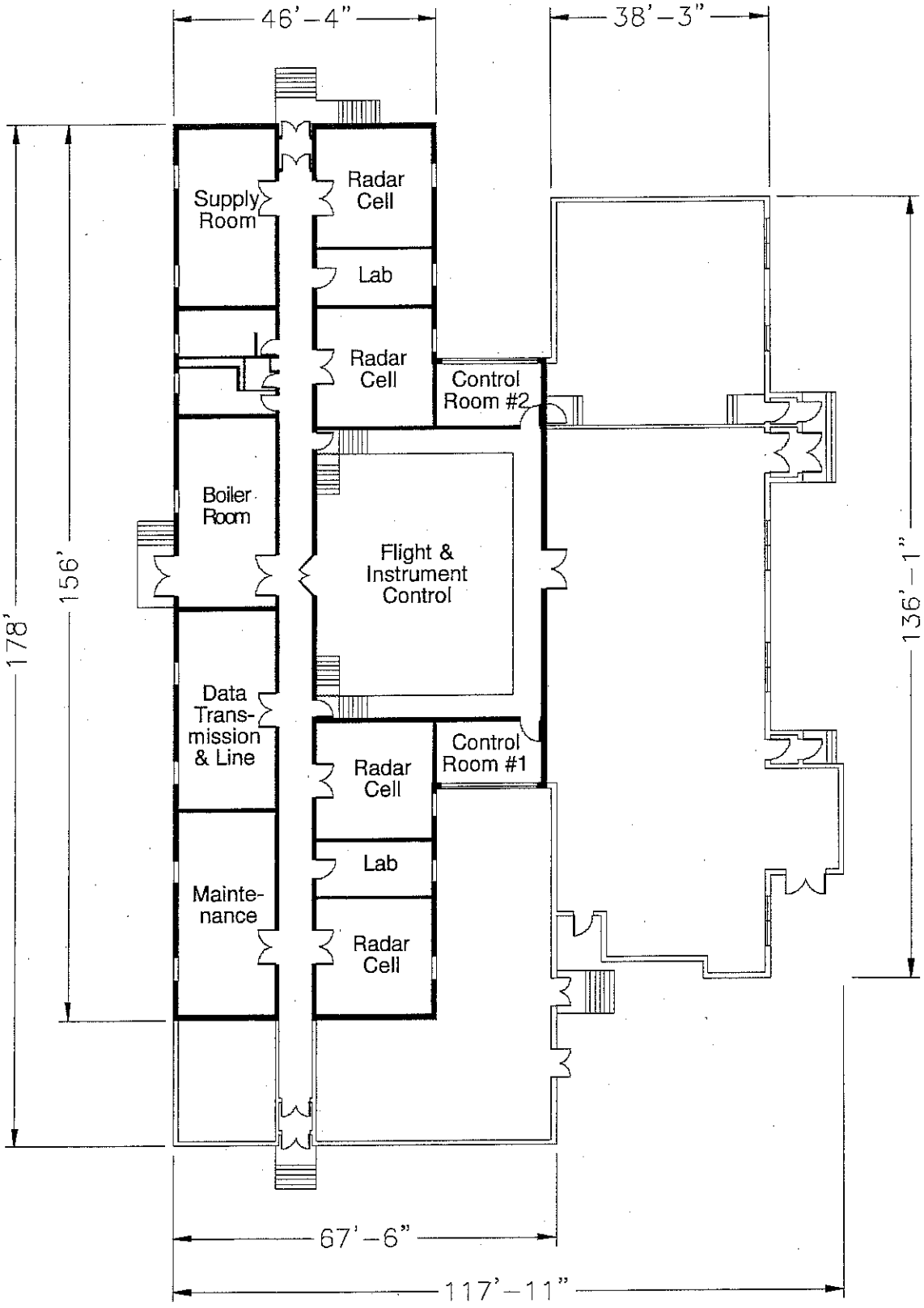
Comments: Building 1102 retains an evident link with its aesthetic and functional historic character.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #49**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1102-1 (c1952)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1102** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-6401* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1103

Specifications and History: See "Cold War Survey" the Layout Plan (Attachment 38) has also been provided.

Attachment 55c shows where the leach field was located for this building in 1984.

Facilities: This building contains the following facilities.

- Tiolets-2
- Urinals-2
- Lavatories-3
- Service Sinks-3

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Timing.
Historic: Telemetering Building.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1103

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance only.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

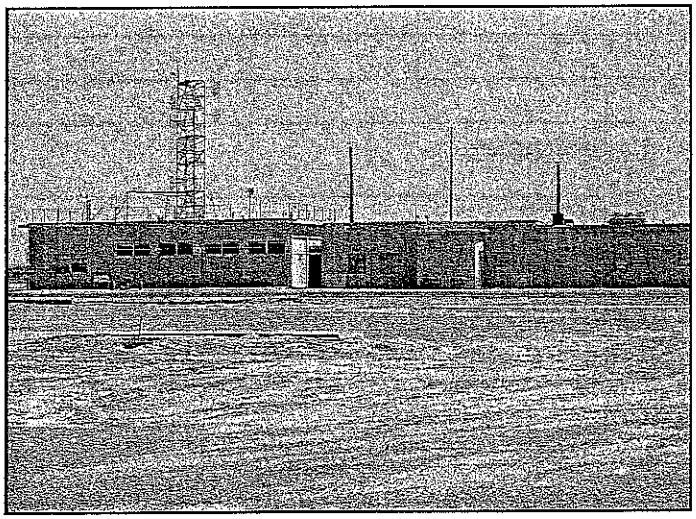
Comments: Few alterations since early improvements.

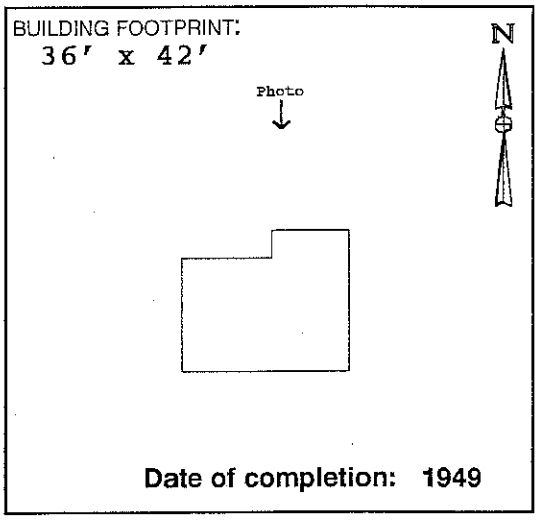
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Research recommended to determine historic use. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1103 is a one-story rectangular building with concrete masonry unit walls, and a flat roof. The original building was completed in 1949, according to "As-built" drawings located in CE File #1103-1. This original construction is centrally located, flanked to the east and west by subsequent additions. Real Property Accountable Record/1103 documents the addition of 2,930 square feet to the original building with the notation "Subsequent Improvements thru May 57." One or both additions to the original building may therefore be considered to be subsequent improvements, rather than additions that compromise historic integrity. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE: (Personal communication with Building 1103 personnel)

Current Function: (East end) Leased by WSMR to transmit mission timings.

Current Function: (West end) Unknown.

Original Function: Telemetering station for data collection of Range missions.

Interim Functions: Real Property Accountable Record/1103: "Communications CTR" (c1962); "Telecom Cen" (c1971); "Comm Fclty" (c1980); "Elec Rsch Rdr" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1103-2 (1967); CE File #1103-1 (1949).

Foundation: Concrete wall footing.

Exterior walls: Painted concrete masonry units (CMU).

Roof: Built-up roof on wood sheathing and 2 x 8 wood joists.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Although perhaps not meeting the "exceptional importance" stipulation imposed on buildings constructed within the last fifty years, Building 1103 may be eligbile for the National Register under Criterion A at a regional or national level in the year 1999. If further research determines that Building 1103 is not eligible as an individual property, consideration should be given to its eligibility as a contributing feature in a Cold War Multiple Property submission for its support of early Cold War-era test launches.

VII. ASSOCIATED BUILDINGS:

Building 1103 was associated during its historic period of significance with Building 1102, mobile data collection vans, and Building 300 at White Sands Missile Range.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1103 appears very different today from depictions on "As-built" drawings dated 1949. It is unclear whether additions to the east and west ends of the original building represent early improvements to the original building, or whether these additions represent later construction that has compromised the historic integrity of the original building. Information obtained from Real Property Record/1103 and field visits seems to indicate that the additions represent early improvements to the original building. If so, Building 1103 retains historic integrity. Further research is needed to verify the construction sequence, and to verify what early Cold War-era research activities were supported by Building 1103. Currently, Building 1103 is leased by the White Sands Missile Range. Aside from minor partitioning at the telemetering room, the original floor plan of the original building shows no alterations. Wood posts (6 x 6) that appear on original drawings to support the roof girders have been removed.

Suggested routine maintenance: Repair, or replace in kind, the exterior wood architectural features, including the soffit, fascia, wood doors, and louvers. Patch spalling concrete at foundation. Remove vegetation at roof.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Original telemetering room is now used as spare equipment storage.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Earlier location plans indicate three utility buildings situated in a row next to Building 1103 to the east. These buildings have been removed. Continues to be set in a somewhat isolated setting, in the vicinity of King-I.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Unable to access some rooms. Those rooms that were accessed, however, appear to have most of the original materials intact. A brick chimney and a metal stack have been removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original windows at north elevation have been covered up at the interior. The telemetering room has been partitioned (reversible).

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity

Comments: Building 1103 personnel are actively engaged in serving as a timing link for White Sands Missile Range tests.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

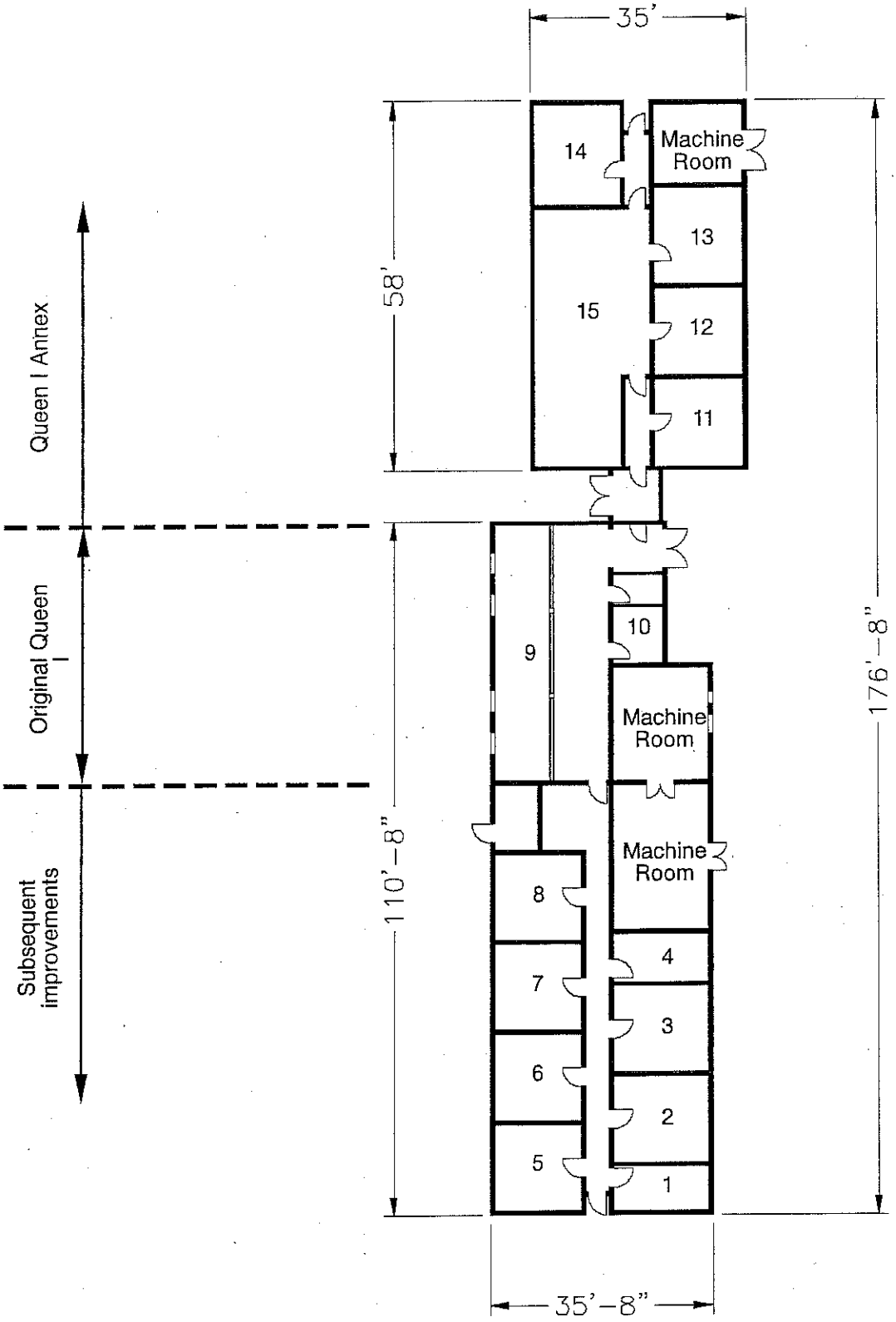
Comments: Building 1103 continues to provide support to the White Sands Missile Range.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #47**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: Dynalectron *Facilities Handbook*, c1964.

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1103** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1108

This building was constructed in 1958 and contains 2626 SF of floor space.
The building was originally built to serve as the telephone exchange. In 1980 it was retitled as a communications facility.
The building contains the following facilities:

- Toilet
- Lavatory
- Janitorial Sink

The drawings provided (Attachment 39-40) show a Utility Plot Plan, Septic Tank Details, Sewer Clean Out, Toilet Room Details and Plan Details.

Attachment 55e shows where the leach field was located for this building in 1984.

Site Specific Contingency Plan: See Attachment 1 and 2

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate into local area on ground

Tank location: North of facility

Fuel Flow - North

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST
MOGAS	250 gal each/ 2 /AST

REMOVED SEPTIC SYSTEMS

BUILDING 1119

This is an Army owned building that contains 2224 SF of floor space. Use and maintenance of the building was transferred to the Air Force in 2005. Prior to the Air Force taking possession the Army had delegated the building to the GSA for use as a vehicle maintenance shop. Once the Air Force took over, the building changed service to an electrical shop and storage facility.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
Diesel	250 gal ea/ 3 /AST
MOGAS	250 gal ea/ 2 /AST
Diesel	750 gal ea/ 3 /AST

Figure 9: Picture of Bldg 1119

REMOVED SEPTIC SYSTEMS

BUILDING 1150

This is also an Army owned building and therefore details are lacking from Holloman's records. The building has 2844 SF.
The original service is unknown, but since the Air Force started using the building it has been used as storage space.
It contains the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 9: Drawing of Bldg 1150

REMOVED SEPTIC SYSTEMS

BUILDING 1154

This is an Army owned building and there is no information in Holloman's files pertaining to this building.

Attachment 55c shows where the leach field was located for this building in 1984.

REMOVED SEPTIC SYSTEMS

BUILDING 1166

This building was constructed in 1960 and contains 4955 SF. The structure is a Test Track Shop/Storage Building known as the "Break Setter Building".
The facilities include:

- Toilets-2
- Urinal
- Lavatory
- Shower

Attachment 41 is a drawing showing the sewer layout and the septic tank details.

Attachment 55c shows where the leach field was located for this building in 1984.

Site Specific Contingency Action: See Attachment 3

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate in local area on ground; if full tank or drum spilled' the substance may reach open ditch.

Material Compatibility: No material incompatibilities

Chemical	Container Type
Oil/Water Separator Waste	500 gal/ 1 / UST

Figure 10: Picture of Bldg. 1166

REMOVED SEPTIC SYSTEMS

BUILDING 1175

Specifications and History: See "Cold War Survey"
Facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

In Attachments 42-44 a trench pit, the toilet room details, the trench junction to UPS, the sanitary sewer manhole and water and sewer piping can be found for Bldg 1175.

Attachment 55c shows where the leach field was located for this building in 1984.

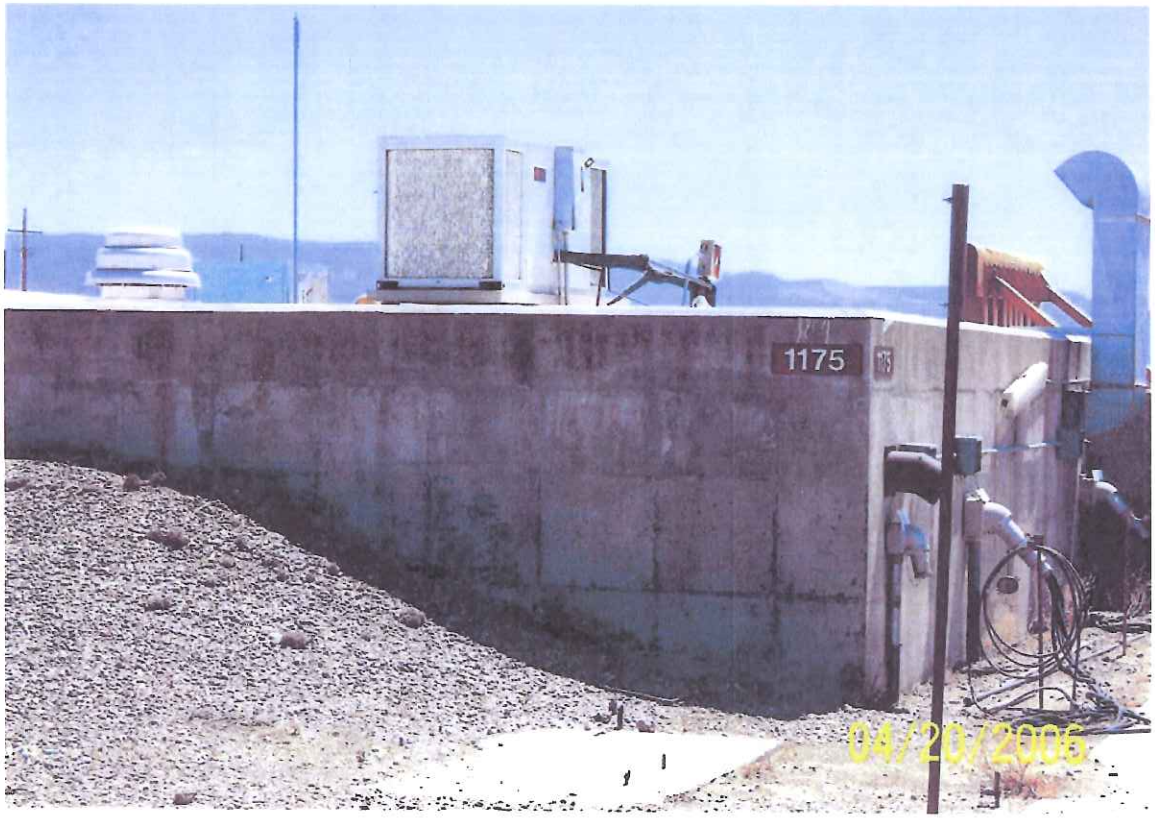


Figure 11: Picture of Bldg 1175

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Blockhouse--"Alpha".
Historic: Blockhouse--"Alpha".
Street Address: 1656 Test Track Rd., HAFB, 88330-7848.

Building Number: 1175

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1175 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

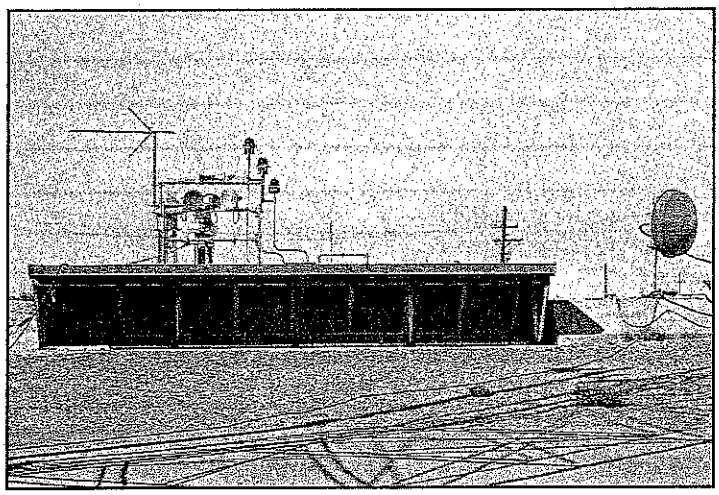
Comments: Modernization at interior to enable continued Test Track use.

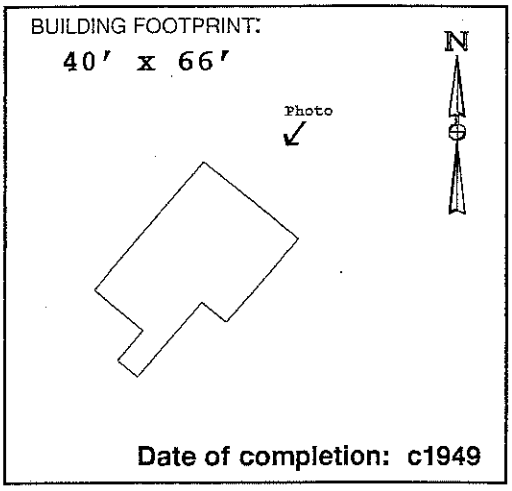
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible for the National Register under Criteria A and/or C.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1175 is an irregularly shaped, one-story concrete structure, built mostly below grade. The building is accessed by a ramp leading down to double doors at the southwest elevation. These doors access the original launch control room constructed in c1949. This entrance, three entrances off of the ramp, and windows facing the track (northeast) are the only visible openings. A 15′ x 32′-6″ addition was constructed at the northwest elevation in 1960 (CE File #1175-2). Another addition, adjacent to northwest side of ramp was completed in 1981 (CE File #1175-3). The ramp extension was also constructed at this time. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1175; CE File #1175-1 (c1949).

Current Function: Launch control facility, High Speed Test Track.

Original Function: Launch control facility, High Speed Test Track.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1175-1 (c1949); CE File #1175 (c1980).

Foundation: Concrete footings.

Exterior walls: Reinforced concrete.

Roof: 3-foot thick reinforced concrete.

Notable interior features, including machinery:
A long row of thick blast-proof windows faces the track to the northeast.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

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VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

"Alpha" Block house Building 1175 is one of the original High Speed Test Track support facilities, constructed c1949 to provide launch control. Recommend that Building 1175 be nominated under Criteria A and C as part of a basewide early Cold War Multiple Property listing.

VII. ASSOCIATED BUILDINGS:

Building 1175 operated, and continues to operate, in support of the high speed test track launching activities, along with Buildings 1162, 1163, 1161, 1645, and the Horizontal Test Stand facility (Buildings 1159 and 1160).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1175 retains historic integrity. Due to its national level of significance under Criteria A and C, recommend that Building 1175 be listed along with the other test track support buildings as part of a Multiple Property nomination to the National Register of Historic Places.

Subsequent improvements to the original Building 1175 augmented the original design and function as a launch control facility for important research conducted at the high speed test track. The interior was renovated in 1984 (CE File #1175-4). Although this renovation obscures original interior finishes, Building 1175 as a whole retains historic integrity of location, design, setting, workmanship, materials, feeling, and association. Of interest to future researchers may be the dramatic changes in computer technology which have occurred since the construction of Alpha Blockhouse: Computers which at that time required several rooms to house, now occupy considerably less space. Launch control operations continue at Alpha Blockhouse, although rooms designed to hold early equipment are virtually empty.

Suggested routine maintenance: Repair bond beam where steel is exposed. Remove vegetation at exterior embankments. Remove debris at front walkway.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Subsequent improvements to the original floor plan added to Building 1175's design and function as a launch control facility.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Except for the construction of smaller buildings in the vicinity, the original setting of Building 1175 near the test track launch pad has been retained.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: The raised wood floor in the console room has been removed. The original light fixtures have been removed. One wood and glass partition has been removed. Sheetrock® walls, carpeting, wainscot, and linoleum have been added to the control room.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original workmanship at the northeast elevation, and at the entrances at the ramp is still visible. Interior renovations hide the original architectural craftsmanship.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1175 continues to function as a launch control facility for the High Speed Test Track.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

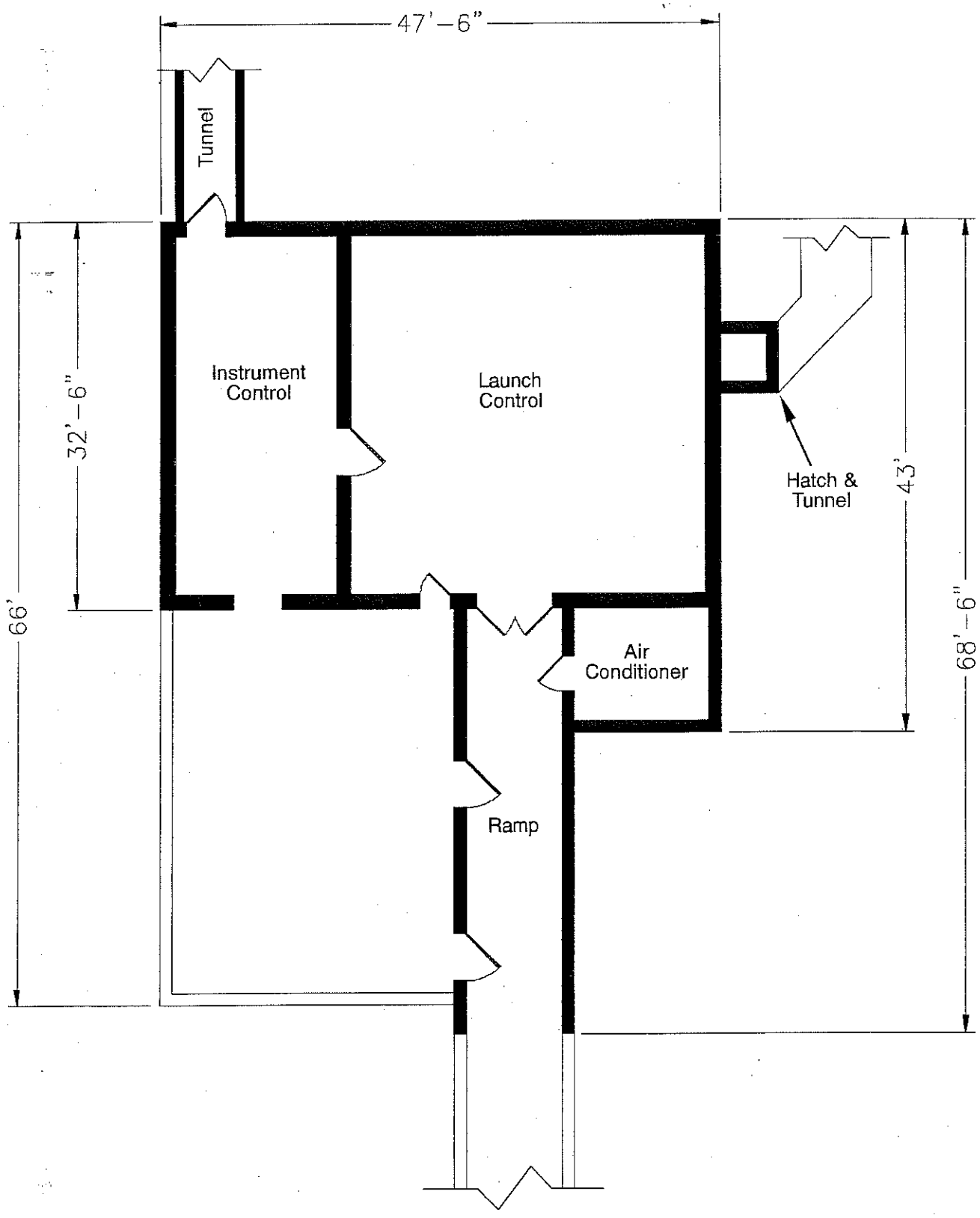
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #35**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1175 (c1980)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1175** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1176

This building was constructed in 1959 and contains 3850 SF.
The building is located at the Test Track and is known as the Sled Launch Shop.
Facilities include:

- Toilet
- Lavatory
- Shower

In Attachments 45-48 a plumbing plan, new drain pit, utility plan, sewer clean out, utilities contour plan and septic tank details can be found for Bldg 1176.

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 12: Picture of Bldg 1176

REMOVED SEPTIC SYSTEMS

BUILDING 1173

This building was constructed in 1957 and contains 17,428 SF.
The building is the main office building at the Test Track.
It contains the following facilities:

- Toilets-8
- Urinals-4
- Lavatories-9
- Janitorial Sinks-2

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 13: Picture of Bldg 1173

REMOVED SEPTIC SYSTEMS

BUILDING 1265

This building was constructed in 1957 and covers 43,388 SF.
This is the Inertial Guidance Facility, previously known as the Guided Weapons Lab.
The building contains the following facilities:

- Toilets-12
- Urinals-6
- Lavatories-12
- Janitorial Sinks-5

This building has been attached to the sewer system at Holloman AFB since before 1984.

In Attachments 49-53 a Water Piping Diagram, Partial Plumbing Plan, Floor Plan, Building, Pavement and Utilities Layout, Sewer Clean Out, and Enlarged Plan can be found for Bldg 1265.

North Wind

Letter No. NW-2008-155

Mr. Dave Griffin
Project Manager
49 CES/CEV
550 Tabosa Ave.
Holloman AFB, NM 88330-8458

11 March 2008

SUBJECT: Technical Memorandum summarizing the decommissioning of inactive septic tanks at HAFB in January of 2008

Dear Mr. Griffin:

Reference Contract Number: W9128F-04-D-0017 DO-0017

Attached please find a copy of the above referenced Technical Memorandum and attached State of New Mexico On-Site Liquid Waste System Abandonment forms. Also attached are copies of the daily reports for the field work.

Please contact me (phone 785-838-3141 or email at tmatzen@northwind-inc.com) or the Program Manager, Rusty Gilbert (phone 210-722-4074 or email at rgilbert@northwind-inc.com) if you have any questions.

Sincerely,

Thomas A. Matzen, P.G.
Project Manager
North Wind, Inc.

Attachments: Technical Memorandum summarizing decommissioning work conducted on inactive septic tanks at HAFB

cc: R. Gilbert (North Wind)
Mr. Tom Zink (USACE Omaha District)
Letter File

North Wind

No	STLF System ID (Building Number)	Date Inspected/ Decommissioned	Findings	Action Taken
19	1250	01/23/08	Located abandoned septic tank. Also found an old diesel tank still containing fuel.	Opened septic tank, pumped out, crushed bottom, and backfilled tank. Notified Mr. Gomolak at CE Environmental regarding diesel UST.
20	1251	01/23/08	Located abandoned septic tank	Opened tank, pumped out, crushed bottom, and backfilled tank.
21	1269	01/16/08	Could not locate any septic tank. Mr. Vernon (a 30+ year employee) stated that the building had been on the base sewer system for the last 30 years and that the septic tank may have been removed when the moat around the building was removed.	Notified Base POC that there does not seem to be a septic tank at this building.
22	1284 (not on original list, added at request of HAFB POC)	01/16/08	Septic tank hangs over back side of area and is not accessible for removal. This tank is a holding tank with a manual valve that drains to a ditch below. There is no water in the associated Bldg.	Notified Base POC. No action taken.

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT
ENVIRONMENTAL HEALTH DIVISION
ON-SITE LIQUID WASTE SYSTEM ABANDONMENT

NMED Permit No.: N/A

System Owner's Name: USACE

Address: HAFB BUILDING # 1251

BUILDING SEWER:

_____ Connected to Sewer Lines or Plugged/Capped based on UPC Requirements

ON-SITE LIQUID WASTE SYSTEM TYPE:

- [✓] Septic Tank
- [ ] Seepage Pit
- [ ] Sec./Tert. Treatment Unit
- [ ] Other:
- [ ] Holding Tank
- [ ] Cesspool

ABANDONMENT PROCEDURE:

- ✓ System Pumped
- ✓ Bottom of System Opened or Ruptured or Unit Collapsed
- ✓ System filled with Earth, Sand, Gravel, Concrete, or Other Approved Material
- ✓ Top Cover Removed or Collapsed
- ✓ System Filled to the Top of Sidewalls or above the Level of any Outlet Pipe
- ✓ System Filled Level with Top of Ground Surface

COMMENTS/VIOLATIONS:

Elevation GPS N32.92411
4184 Ft W 106.07173

ABANDONMENT PERFORMED BY:

Company Name: Frontel Septic Co.

Address: PO Box 927 Tularosa NM 88337

NMED ACTION TAKEN:

- [ ] **Abandonment Approved**
- [ ] **Abandonment Approved w/conditions** (See Comments/Violations)
- [ ] **Abandonment Not Approved** (See Comments/Violations)

FINAL APPROVAL:

- [ ] Granted
- [ ] Not Granted

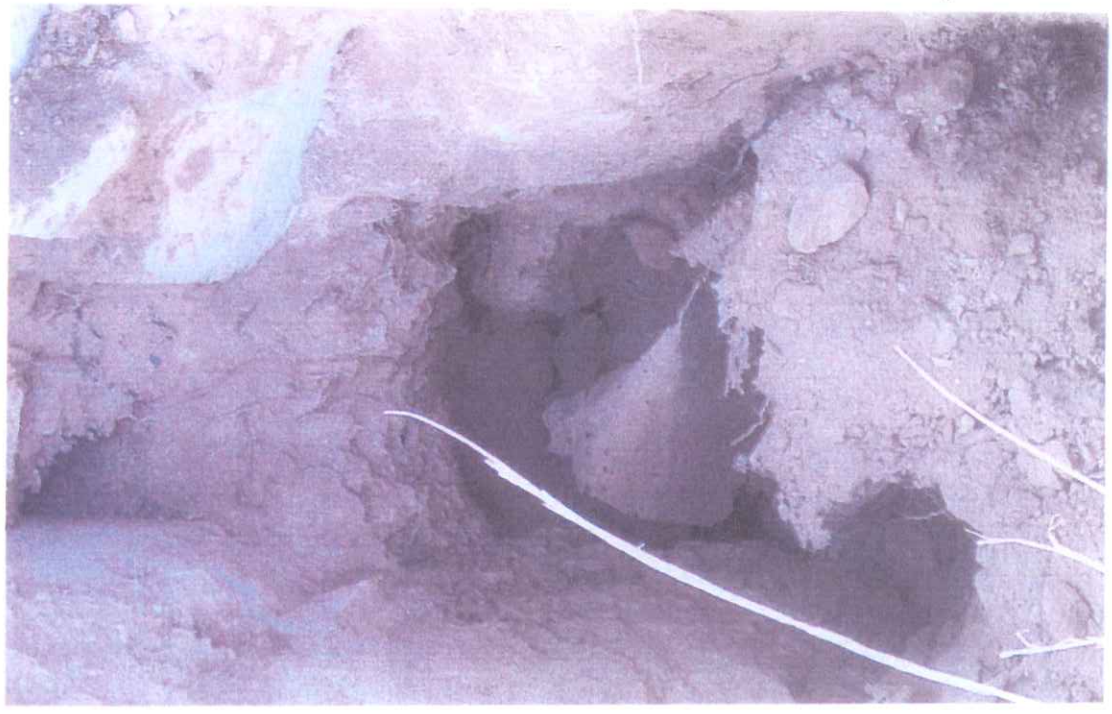
_____
NMED Inspector Date

OK - If Abandoned and meets Requirements	N/C - Not Compliant
N/I - Not Inspected	N/V - Not Verified
N/A - Not Applicable	

BLDG 1251

B/25)

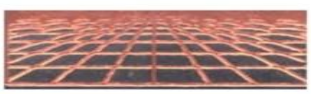
BLDG 1251



Appendix B
Geophysical Report

ULS SERVICES CORPORATION

GEOMARKOUT LOCATING Co a tradename



SAN DIEGO–LA . SF- SAC . SEATTLE . ALASKA . HAWAII- GUAM

1 (800) 528 – 8206 www.geomarkout.com 1 (866) 804 – 5734

---------- *A Veteran Owned Small Business* ----------

5 July 2012

Christopher Long, P.G.
Scientist
Federal Services
Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, TX 77077

Subject: Field Documentation Report for Geophysical Services -
Location of Utilities and Underground Features Associated
With Former UST and Septic System Sites,
Holloman AFB, NEW MEXICO (SHAW PO 783916-000 OP)

Gentlemen:

This report documents the recent Geophysical Survey field work ULS Services Corp completed at the subject site On and between the dates of 11 June 2012 thru 23 June 2012.

SHAW / ULS SERVICES CORP
GEOPHYSCIAL SERVICES
FORMER UST AND SEPTIC SYSTEM SITES
5 JULY 2012

SCOPE OF WORK

Scope of this work is includes geophysical services at approximately 29 Former UST or Septic Systems sites located across Holloman AFB that have reportedly undergone past abandonment in place or excavation activities. Geophysical services are employed in an attempt to locate potential USTs, former UST excavation areas, abandoned septic tanks or excavations and associated leach field areas. Location of underground utilities near these observed features is included. Observations are marked out in field and electronically mapped with GPS data collection and GIS presentation. Survey of each site is approximately 25 by 25 to 100 by 100 feet in size.

METHODS

Methods utilized in performance of this work include: Visual Inspection, Analog Real - Time Electromagnetic Induction Conductivity Detection (EMICD), Magnetic Locating (MGL), Ground Penetrating Radar (GPR), and EM Pipe and Cable Location (EMPCL). A sub-meter WAAS GPS receiver with automatic real -time differential correction and ESRI Arcpad software is utilized to collect observation data. ESRI Arc View 10 GIS software is utilized for mapping presentation.

EMIMD ground induction methods are employed to detect both 1) broad metal mass anomalies (Rectangular Surface Projections) or conductive zones that may be indicative of potential USTs – Septic tanks, conductive metal debris, steel reinforced concrete, UST's, building hosts, piping, building demo materials, drums, sumps or other unknown burial materials; and 2) to detect relative lateral changes in conductive zones of soil or backfill materials relative to native soils. Former UST excavations and septic -leachate material may potentially have a higher conductive response or well drained leachate fill materials associated with septic systems may in some cases exhibit a relatively lower or quiet conductive response relative to surrounding higher conductive soil response. A two-way Cartesian grid pattern of five by five feet is walked within the search area (site). Observations are real time and marked on ground surface with paint and pin flagging. Observations are collected with a sub- meter GPS with automatic differential correction and plotted approximately onto web based imagery.

GPR is utilized to detect and potentially observe former UST excavation sidewalls as well as septic – leach field pit sidewall and fill areas. GPR is also utilized to compliment the EM Pipe and Cable utility survey work by potentially locating conductive as well as non-conductive utilities.

A EM Pipe and Cable Survey is conducted at each site by performing ambient passive live power and communication line sweeps, active ground induction sweeps, and active direct- connect or induction- clamp sweeps using existing conducts or pipes visibly nearby. Multiple active frequencies are utilized for best Detection. Utilities are identified where possible and marked unknown if not identified.

All observations are marked with hi-visibility orange-red marking paint. Some Ares are hi-lighted with black paint due to light soil conditions. GPR boundaries indicating potential septic tank and leach field areas are outlined with black paint. Pin flags are also utilized to mark these boundaries in soft soil and weed areas.

OBSERVATIONS

Site Description

The Project Site (Holloman AFB - Former UST and Septic Systems) is comprised of approximately 29 different environmental site locations (heir in referred to as Sites) . Each sites includes and varies in description from existing active building locations to in-active remote abandoned to former building areas where USTs or Septic systems were utilized in the past. Each Site is fairly flat with sandy to gravelly surface conditions. Some sites include native brush and weeds. Sites near active building areas include asphalt or concrete surfaces, sidewalks and planter areas. ULS field staff helped review historical documentation available of each site in the field. Where available, drawings and photographs were reviewed. When available, reported GPS coordinates from reports, of septic tank locations, were utilized by SHAW field staff to navigate to septic tank location to aid focus search area.

Generally there are no surface indications of USTS or Septic tanks, however some limited features exist at some sites and include potential vent riser pipes and asphalt patching, settling areas, and conidial – rectangular cracks in concrete. Surface indications of septic systems at some sites include potential inactive clean- outs pipes near building and nearby existing upgraded sewer man-hole systems that have been connected to the existing Base sewer collection system. Some septic system sites have open holes , surface erosion, and associated potential underground voids observed near the inactive cleanouts and suspected septic search area.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

General ambient or background EM conditions at this site are categorized as being high or noisy most likely resulting from caliche or saline soil conditions throughout the area. These conditions all result in a high ambient background EMICD response that are difficult to filter out, however, subtle to distinct lateral changes are observed potentially marking position of former UST excavations. Magnetic locator is not affected by saline conditions. GPR response in these conditions is poor to somewhat fair, however, subtle, trends in GPR observations exhibit dipping or high angle (from horizontal) refraction bands indicating potential soil side-wall trends allowing for location of approximate former excavations. The use of EMICD and GPR data in conjunction with historical information and physical observations are all utilized to mark the approximate location of potential former USTs in the field as shown on the GIS imagery maps.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

Similar response is observed near former septic systems. Most all septic tanks are reported to have been abandoned in place or partly crushed in place. Magnetic locator surveys revealed concentrated areas of metal response (metal anomalies) likely from metal plates and rebar in septic tanks in areas near former sewer clean-outs and next to reported septic tank locations where latitude and longitude data is available. EM Induction and GPR transects over these metal anomalies further corroborated these findings. EM Induction survey results near the effluent (down gradient) side of metal anomalies (potential septic tanks) resulted in observation of relatively moderately higher lateral response to zones of low to quiet lateral response zones near the septic tanks relative to the ambient response in surrounding area. GPR data across these zones exhibited very subtle side-wall trends that appear to corroborate with EMICD findings. The use of EMICD and GPR data in conjunction with historical information and physical observations of cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs in the field and as shown on the GIS imagery maps.

CONCLUSIONS and LIMITATIONS

The use of EMICD and GPR data in conjunction with historical information and physical observations of reported building location, vent riser location, boiler room location, existing and abandoned sewer cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs , Septic tanks and leach fields. Ambient soil conductivity at this site is very high and EM and GPR data observed is very subtle. Field trends are used to mark the approximate location of potential targets.

As in any type of survey or investigation to determine characteristics below grade, careful exploratory excavation or drilling may be needed to further help determine a more accurate determination of the subsurface. Use of hand tools and air knifing is also useful to help as a safety measure. Base one- call utilities, as well as, private 811 one –call should be consulted and recalled as necessary.

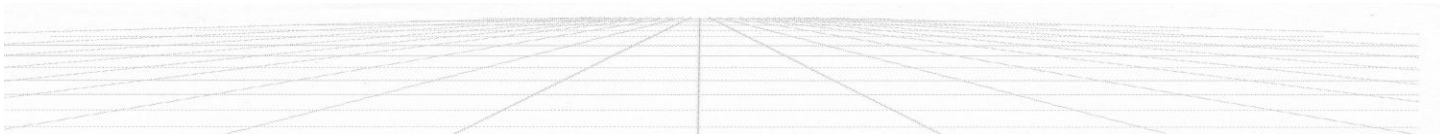
If you have any questions regarding this report please contact me at (206) 384- 2857.

Sincerely,

ULS SERVICES CORPORATION
Geomarkout tradename

Michael W. Benedict
Site Representative

Admin Office/Billing: PO Box 724 Pocatello, Idaho 83204
(208) 234-1441 Fax (208) 234-1507 1 800 301-4420
Seattle / Portland / SAC / Alaska / HWI – AS - GUAM Operations
1 - (866) 804- 5734 / San Diego – LA / Operations 1 - (800) 528-8206



BLDG 1251 SEPTIC SYSTEM
HOLLOMAN AFB

WGS_1984_UTM_Zone_13N
ULS SERVICES CORP
mwb 13 June 2012

0 12.5 25 50 75 100
Feet

Appendix C
Sample Collection Logs

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager **Christopher Long**

Location Code **OTC540**

RFA / COC Number 144106-H001

Sample Number **OTC540-IS-0001-MMDDYY** ← Labeled as OTC540-062012-~~INF2~~ INF1

Task

Sample Name **OTC540-z-OTC540-IS-0001-MMDDYY-z**

Collection Date 06-20-12

Sampling Method **Unknown**

Sample Type **Unknown**

Collection Time ~~1330~~ RGD 1320

Sample Purpose **Unknown**

Start Depth 10 RGD 31

QC Code **NORMAL ENVIRONMENTAL SAMPL**

End Depth 12 RGD 5

Sampling Equip _____

Sample Matrix **SOIL**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam BS

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: _____

Sketch Location:

Shaw *Logged By / Dat* Rachel Daly 6/20/12 *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

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Manager **Christopher Long**

Location Code **OTC540** ← LOGGED AS *RFA / COC Number* 144106 - H001

Sample Number **OTC540-IS-0002-MMDDYY** OTC540-062012-INF2 *Task*

Sample Name **OTC540-z-OTC540-IS-0002-MMDDYY-z** *Collection Date* 06-20-12

Sampling Method **Unknown** *Sample Type* **Unknown** *Collection Time* 1335

Sample Purpose **Unknown** *Start Depth* 10'

QC Code **NORMAL ENVIRONMENTAL SAMPL** *End Depth* 12'

Sampling Equip _____ *Sample Matrix* **SOIL**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* BS

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: _____

Sketch Location:

06-20-12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager **Christopher Long**

Location Code **OTC540** LABEL/COC AS OTC540-062012-TNK1 *RFA / COC Number* 144106-H001

Sample Number **OTC540-IS-0003-MMDDYY** *Task*

Sample Name **OTC540-z-OTC540-IS-0003-MMDDYY-z** *Collection Date* 06-20-12

Sampling Method **Unknown** *Sample Type* **Unknown** *Collection Time* 1355

Sample Purpose **Unknown** *Start Depth* 7'

QC Code **NORMAL ENVIRONMENTAL SAMPL** *End Depth* 9'

Sampling Equip _____ *Sample Matrix* **SOIL**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* BS

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

06-20-12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw: a world of Solutions

Manager **Christopher Long**

Location Code **OTC540** LABEL/COLAS ↘ *RFA / COC Number* 144106.H001

Sample Number **OTC540-IS-0004-MMDDYY** OTC540-062012-TNK2 *Task*

Sample Name **OTC540-z-OTC540-IS-0004-MMDDYY-z** *Collection Date* 6-20-12

Sampling Method **Unknown** *Sample Type* **Unknown** *Collection Time* 1410

Sample Purpose **Unknown** *Start Depth* 14'

QC Code **NORMAL ENVIRONMENTAL SAMPL** *End Depth* 16'

Sampling Equip _____ *Sample Matrix* **SOIL**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* RD

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: _____

Sketch Location:

06-20-12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager **Christopher Long**

Location Code **OTC540** LABEL/COC AS ↘ *RFA / COC Number* 144106-H001

Sample Number **OTC540-IS-0005-MMDDYY** OTC540-062012-EFF1 *Task*

Sample Name **OTC540-z-OTC540-IS-0005-MMDDYY-z** *Collection Date* 06-20-12

Sampling Method **Unknown** *Sample Type* **Unknown** *Collection Time* 1430

Sample Purpose **Unknown** *Start Depth* 3'

QC Code **NORMAL ENVIRONMENTAL SAMPL** *End Depth* 5'

Sampling Equip _____ *Sample Matrix* **SOIL**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* BS

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOl
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: _____

Sketch Location:

06-20-12

Shaw *Logged By / Dat* Rachel Daly *Reviewed By / Dat* _____

Sample Collection Log

Station 3

- Holloman AFB

Shaw: a world of Solutions

Manager Christopher Long

Location Code OTC540

LABEL/COC AS

RFA / COC Number 144106-H001

Sample Number OTC540-IS-0006-MMDDYY OTC540-062012-EFF2 *Task*

Sample Name OTC540-z-OTC540-IS-0006-MMDDYY-z

Collection Date 06-20-12

Sampling Method Unknown

Sample Type Unknown

Collection Time 1445

Start Depth 10

Sample Purpose Unknown

End Depth 12

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip _____

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: _____

Sketch Location:

Shaw *Logged By / Dat* _____ *Reviewed By / Dat* _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code **OTC540**

RFA / COC Number 14406-H002

Sample Number **OTC540-IS-0007-MMDDYY**

Task

Sample Name **OTC540-z-OTC540-IS-0007-MMDDYY-z**

Collection Date 06-21-12

Sampling Method **Unknown**

Sample Type **Unknown**

Collection Time 0815

Sample Purpose **Unknown**

Start Depth 3'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

End Depth 5'

Sampling Equip

Sample Matrix **SOIL**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Rachel Daly 6/21/12

Logged By / Dat

Reviewed By / Dat

Sample Collection Log

Station 4

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code **OTC540**

RFA / COC Number 144106-H002

Sample Number **OTC540-IS-0008-MMDDYY**

Task

Sample Name **OTC540-z-OTC540-IS-0008-MMDDYY-z**

Collection Date 6/21/12

Sampling Method **Unknown**

Sample Type **Unknown**

Collection Time 0825

Sample Purpose **Unknown**

Start Depth 10'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

End Depth 12'

Sampling Equip _____

Sample Matrix **SOIL**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Rachel Daly 6/21/12

Logged By / Dat

Reviewed By / Dat

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

STATION # 4C

Manager **Christopher Long**

Location Code **OTC540**

RFA / COC Number 144106 - H045

Sample Number **OTC540-IS-0009-~~MMDDYY~~** 091712

Task 144106 - SM20000

Sample Name **OTC540-z-OTC540-IS-0009-~~MMDDYY~~-z** 091712

Collection Date 9/17/12

Sampling Method ~~Unknown~~ GEOPROBE

Sample Type ~~Unknown~~ GRAB

Collection Time 08:20

Start Depth 14'

Sample Purpose **Unknown**

End Depth 16'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sampling Equip Geoprobe/Aluminum Tray

Sample Matrix **SOIL**

QC Partners:

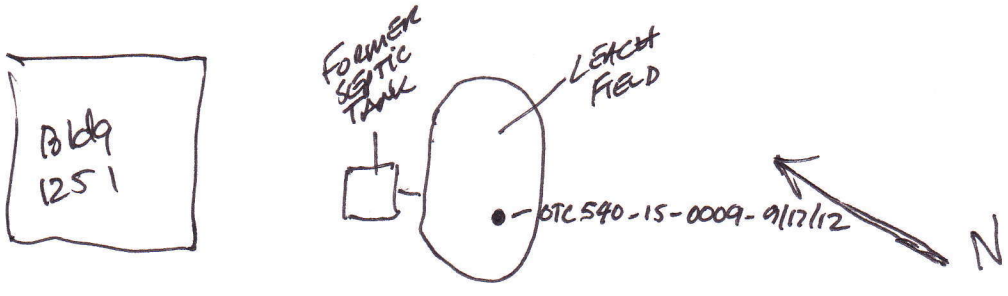
(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: CONFIRMATION SAMPLE NEAR ORIGINAL STATION #4
2' SOUTHEAST OF ORIGINAL STATION #4
14'-16' DEPTH

Sketch Location:



Shaw *Logged By / Dat* _____ *Reviewed By / Dat* _____

Sample Collection Log

IDW Soil

Shaw Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code ~~FIELDQC~~ IDW

RFA / COC Number HO 38

Sample Number ~~OTC644-GW-0111-MMDDYY-FD~~ LDY-IDWD1-090412

Sample Name ~~FIELDQC-1-OTC644-GW-0111-MMDDYY-FD-z~~

Task

Collection Date 09/04/2012

Sampling Method ~~Unknown~~ Composite

Sample Type ~~Unknown~~ Soil

Collection Time 1330

Sample Purpose ~~Unknown~~ IDW characterization

Start Depth NA

QC Code ~~FIELD DUPLICATE~~ NA

End Depth NA

Sampling Equip Stainless steel trowel/bowl/Aluminum

Sample Matrix ~~GROUND WATER~~ IDW Soil

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam LaThom, Hodu

Containers:

	Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
1)	VOCs by SW8260C TCLP VOCs	A	Unknown	~~3~~ 1	~~40 8oz~~	~~ML~~	~~40 ml VOA Vials~~ Glass	~~HCL~~ Cool to 4°C
	~~SW8015B : GRO~~	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
2)	SVOCs by SW8270D TCLP SVOCs / other organics	EB	Unknown	~~2~~ 1	8	x oz	~~1 Liter Amber Glass~~ Glass	Cool to 4°
	~~SW8015B : GRO~~	D	Unknown	0	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~SW8015B : DRO~~	D	Unknown	2	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~PCBs by SW8082A~~ ~~TCLP~~	E	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
	~~Explosives by SW8330A~~	F	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
3)	~~Tritium by 906.0 Mod~~ RCI	C	Unknown	~~2~~ 1	~~1~~ 8oz		~~1 Liter Amber Glass~~ Glass	~~Cool to 4°C~~ Cool to 4°C
4)	Mercury by SW7470A TCLP Mercury	~~F~~ D	Unknown	~~0~~ 1	~~500 8oz~~ x oz	~~ML~~	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
5)	Metals by SW6020A TCLP Metals	~~H~~ E	Unknown	~~0~~ 1	~~500 8oz~~	~~ML~~	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
	~~Metals by SW6010C~~	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
	~~Total CN water by 335.4~~	I	Unknown	1	500	ML	~~500 ml Poly Container~~	NaOH
	~~TDS by 160.1~~	J	Unknown	1	500	ML	500 ml Poly Container	Cool to 4°

Comments: Composite soil sample for TCLP analyses of IDW cuttings rolloff at Laydown Yard, 09/04/12

Sketch Location: Rolloff box composite sample @ Laydown Yard.

Analyses: TCLP VOCs, TCLP SVOCs, TCLP metals, TCLP Mercury, RCI

LDY = Laydown Yard

~~Shaw~~ *Logged By / Dat* Mel Hall *Reviewed By / Dat* _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code BULK WATER TANK

Sample Number HAFB-IDW-BULKWATER-0001-111612

Sample Name HAFB-IDW-BULKWATER-0001-111612

RFA / COC Number 144106 H070

Task 144106 .JM20000

Collection Date 11/16/12

Sampling Method BAILER

Sample Type GRAB

Collection Time 13:00

Sample Purpose CONFIRM IDW

QC Code EQUIPMENT BLANK

Start Depth N/A

End Depth N/A

Sampling Equip DISPOSABLE BAILER

Sample Matrix **WATER**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam JH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	B	Unknown	4	8	OZ	8OZ Amber Glass	Cool to 4°
SW8015 : ORO	C	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015 : DRO	C	Unknown	1	1	L	1 Liter Amber Glass	H2SO4
Metals by SW6020A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
METALS by SW6020A	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Mercury by SW7470A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Metals by SW6010C	D	Unknown	1	500	ML	500 ml Poly Container	HNO3
	E		1	500	ML	500 ml Poly Cont	Cool to 4°
SW8015 : GRO	F	Unknown	3	40	ML	40 ml VOA Vials	HCL

Comments: Sample collected from Bulk water Storage tank after all water drums were consolidated. Sent both a preserved and unpreserved 500ml Poly for Metals. Spoke with Lab and they said to send unpreserved, but I think maybe they made a mistake.

Sketch Location:

Shaw *Logged By / Dat* _____ *Reviewed By / Dat* _____

Appendix D
Boring Logs

Boring ID: OT-C540-Station 1

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1251

Date Completed: 6/20/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4181.72
Y Coordinate: 699989.0266
X Coordinate: 1695113.9508

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); light reddish brown; dry; medium firm.	ML	Hand auger from 0 - 5 ft. Began drilling on 6/20/12.
5		OTC540-IS-0001-062012	NR		Same as above (0 ft).		
10		OTC540-IS-0002-062012	NR		Same as above (0 ft).		
15							Total depth = 13 ft. Reached total depth on 6/20/12. **Water table not encountered in this boring.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:50 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C540-Station 2

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1251

Date Completed: 6/20/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4181.82
Y Coordinate: 699971.0008
X Coordinate: 1695119.8281

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); red; dry; soft to medium firm.	ML	Hand auger from 0 - 5 ft. Began drilling on 6/20/12.
5			NR		Same as above (0 ft); red to light reddish brown; medium stiff.		
		OTC540-IS-0003-062012					
10			NR		Same as above (0 ft); light reddish brown.		
15		OTC540-IS-0004-062012	NR		Same as above (0 ft); reddish brown to brown; soft.		
20							Total depth = 17 ft. Reached total depth on 6/20/12. **Water table not encountered in this boring.
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:50 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C540-Station 3

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1251

Date Completed: 6/20/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4181.39
Y Coordinate: 699965.9693
X Coordinate: 1695113.1170

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); light brown to white; dry; soft.	ML	Hand auger from 0 - 5 ft. Began drilling on 6/20/12.
5		OTC540-IS-0005-062012	NR		Same as above (0 ft).		
10		OTC540-IS-0006-062012	NR		Same as above (0 ft).		
15							Total depth = 13 ft. Reached total depth on 6/20/12. **Water table not encountered in this boring.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:50 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C540-Station 4

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1251

Date Completed: 6/21/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4180.49
Y Coordinate: 699948.3514
X Coordinate: 1695107.2427

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); light brown to white; dry; soft.		Hand auger from 0 - 5 ft. Began drilling on 6/21/12.
5		OTC540-IS-0007-062112	NR		Same as above (0 ft).		
10		OTC540-IS-0008-062112	NR		Same as above (0 ft).		
15			NR		Same as above (0 ft).	ML	
20			NR		Same as above (0 ft).		
25			NR		Same as above (0 ft); white; soft to medium firm.		
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:50 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C540-Station 4

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1251

Date Completed: 6/21/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4180.49
Y Coordinate: 699948.3514
X Coordinate: 1695107.2427

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
30			NR		SILT (ML); white; soft to medium firm.	ML	
35			NR		Lean CLAY (CL); red; damp; firm; medium to high plasticity.		
40			NR		Lean CLAY with Sand (CL); red; damp; medium stiff to stiff; medium plasticity.	CL	
45			NR		Same as above (35); medium stiff; trace very fine sand. Note: trace gypsum crystals.		
50			NR				Total depth = 50 ft. Reached total depth on 6/21/12. **Water table not encountered. Well not constructed at this location.
55							
60							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:50 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C540 Station 4C

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1251

Date Completed: 9/17/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: T. Hiltunen

Ground Elevation AMSL (ft):4180.49
Y Coordinate: 699948.3514
X Coordinate: 1695107.2427

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			0.0		Silty SAND (SM); dark brown to light tan; dry; trace caliche. Note: no clay is present.		Began drilling on 9/17/12. Station 4C was installed as a confirmation borehole 2 ft southeast of the original Station 4.
5			0.0		Same as above (0 ft); light tan.		
10			0.0		Same as above (0 ft); white.	SM	
15		OTC540-IS-0009-091712	0.0		Same as above (0 ft); white; Note: no caliche is present.		
20			0.0				Total depth = 20 ft. Reached total depth on 9/17/12.
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 4/23/13 12:01 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Appendix E
Site Survey Data

Revised Rpt
09/11/2013
(re: TU/US-C513)
p. 7 of 10

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	682987.8550	1687022.9920	4098.16	BASE	682789.9107	1686534.0572
2	678390.1010	1678735.5020	4064.77	CP-52-P-19	678193.4892	1678248.9690
3	683252.1480	1680789.5360	4078.80	CP-55-JACK	683054.1271	1680302.4077
4	681667.1260	1694574.3780	4140.57	CP-56-AIR	681469.5645	1694083.2546
5	669733.4460	1682234.2110	4048.59	HAFB-07-07	669539.3431	1681746.6640
6	669695.2030	1718768.4150	4157.95	ALAMOAIR	669501.1112	1718270.2797
7	674362.7100	1713591.4300	4160.17	F248	674167.2655	1713094.7951
8	676850.6600	1718114.2590	4193.99	E-248	676654.4944	1717616.3133
50	691964.7620	1687201.2770	4140.90	MALONE	691764.2160	1686712.2905
51	662077.1700	1670356.4250	4077.10	BATE	661885.2861	1669872.3205
52	678390.1080	1678735.5040	4066.10	P 19	678193.4962	1678248.9710
53	644127.0780	1700529.8000	4039.00	MONT	643940.3964	1700036.9506
54	676850.6920	1718114.2670	4193.99	E 248	676654.5264	1717616.3213
55	683252.1970	1680789.5390	4080.20	JACK	683054.1761	1680302.4107
56	681667.0380	1694574.3640	4141.20	AIR	681469.4765	1694083.2406
82	678193.4999	1678248.9801	4064.92	P	677996.9451	1677762.5882
84	676654.5300	1717616.3305	4192.77	E	676458.4212	1717118.5291
85	683054.1798	1680302.4198	4079.02	JACK	682856.2163	1679815.4327
86	681469.4802	1694083.2497	4140.00	AIR	681271.9760	1693592.2686
100	685975.0760	1686614.9100	4101.87	OT-C534-PVC	685776.2660	1686126.0934
101	685975.4260	1686614.8310	4102.28	OT-C534-CASING	685776.6159	1686126.0145
102	685952.4860	1686626.9650	4101.89	OT-C534-W2-PVC	685753.6825	1686138.1449
103	685952.6870	1686626.9300	4102.33	OT-C534-W2-CASING	685753.8834	1686138.1099
104	685939.9110	1686581.7340	4101.89	OT-C534-W1-CASING	685741.1111	1686092.9270
105	685939.6450	1686581.7790	4101.57	OT-C534-W1-PVC	685740.8452	1686092.9720
106	685924.3640	1686619.9800	4101.81	OT-C534-W4-PVC	685725.5687	1686131.1620
107	685924.6590	1686619.8790	4102.23	OT-C534-W4-CASING	685725.8636	1686131.0610
108	685934.1180	1686578.3320	4101.72	OT-C534-LEACH-NG	685735.3198	1686089.5260
109	685935.7830	1686600.7340	4101.88	OT-C534-LEACH-NG	685736.9843	1686111.9215
110	685938.2680	1686607.0980	4101.88	OT-C534-LEACH-NG	685739.4686	1686118.2837
111	685951.4240	1686604.4600	4101.90	OT-C534-LEACH-NG	685752.6208	1686115.6465
112	685953.8200	1686601.1380	4101.88	OT-C534-LEACH-NG	685755.0161	1686112.3254
113	685953.2500	1686596.8650	4101.88	OT-C534-LEACH-NG	685754.4463	1686108.0537
114	685946.2830	1686578.3790	4101.81	OT-C534-LEACH-NG	685747.4813	1686089.5730
115	685945.3070	1686576.3400	4101.88	OT-C534-LEACH-NG	685746.5056	1686087.5346
116	685940.6850	1686575.6580	4101.79	OT-C534-LEACH-NG	685741.8849	1686086.8528
117	685952.3510	1686614.8200	4102.03	OT-C534-LEACH-NG	685753.5475	1686126.0035
118	685953.0040	1686623.0300	4102.13	OT-C534-LEACH-NG	685754.2004	1686134.2111
119	685945.6920	1686623.1960	4102.03	OT-C534-LEACH-NG	685746.8905	1686134.3770
120	685944.8810	1686615.5440	4101.97	OT-C534-LEACH-NG	685746.0797	1686126.7272
121	685948.0570	1686615.1700	4101.97	OT-C534-FLINE-NG	685749.2548	1686126.3534
122	685947.7680	1686606.3420	4101.81	OT-C534-FLINE-NG	685748.9659	1686117.5279
123	685953.2050	1686618.0690	4102.08	OT-C534-ENFLU-NG	685754.4013	1686129.2515
124	685968.5800	1686611.5870	4102.06	OT-C534-ENFLU-NG	685769.7718	1686122.7714
125	686021.5760	1686604.3860	4102.49	OT-C534-ENFLU-NG	685822.7525	1686115.5725
126	686051.0660	1686600.5520	4102.82	OT-C534-ENFLU-NG	685852.2339	1686111.7396
127	682943.9250	1686529.5770	4094.74	OT-C536-STATION1-NG	682745.9934	1686040.7852
128	682925.1900	1686534.9010	4094.63	OT-C536-STATION2-NG	682727.2639	1686046.1076
129	682914.0740	1686530.8350	4094.17	OT-C536-STATION3-NG	682716.1511	1686042.0428
130	682900.2750	1686534.1950	4094.40	MW-OT-C5361-CASING	682702.3561	1686045.4018
131	682900.0410	1686534.2560	4094.03	MW-OT-C5361-PVC	682702.1222	1686045.4628
132	682892.0960	1686514.3610	4094.08	OT-C536-LEACH-NG	682694.1795	1686025.5736
133	682905.9860	1686504.4840	4093.98	OT-C536-LEACH-NG	682708.0654	1686015.6994
134	682914.9460	1686505.2970	4094.10	OT-C536-LEACH-NG	682717.0228	1686016.5122
135	682919.4610	1686521.1490	4094.40	OT-C536-LEACH-NG	682721.5365	1686032.3596
136	682921.1340	1686534.7310	4094.42	OT-C536-LEACH-NG	682723.2091	1686045.9377
137	682919.5910	1686545.0230	4094.72	OT-C536-LEACH-NG	682721.6665	1686056.2267
138	682912.1700	1686551.2270	4094.60	OT-C536-LEACH-NG	682714.2477	1686062.4289
139	682897.7180	1686551.9240	4094.16	OT-C536-LEACH-NG	682699.7998	1686063.1257
140	682892.5110	1686549.8820	4094.18	OT-C536-LEACH-NG	682694.5943	1686061.0843
141	682922.3680	1686533.4440	4094.42	OT-C536-TANKPIT-NG	682724.4427	1686044.6510
142	682920.9800	1686525.5880	4094.39	OT-C536-TANKPIT-NG	682723.0551	1686036.7973
143	682928.0220	1686524.4280	4094.63	OT-C536-TANKPIT-NG	682730.0951	1686035.6377
144	682929.2370	1686532.7090	4094.62	OT-C536-TANKPIT-NG	682731.3097	1686043.9163
145	682949.7020	1686528.9800	4094.75	OT-C536-ENFLU-NG	682751.7688	1686040.1883
146	682921.2900	1686528.9090	4094.41	OT-C536-ENFLU-NG	682723.3650	1686040.1174
147	682916.2970	1686530.1310	4094.27	OT-C536-ENFLU-NG	682718.3735	1686041.3390
148	682877.6850	1686739.3620	4095.03	OT-C533-MW-CASING	682679.7726	1686250.5094
149	682877.4490	1686739.4350	4094.68	OT-C533-MW-PVC	682679.5367	1686250.5823
150	682884.2550	1686735.8390	4094.76	OT-C533-LEACH-NG	682686.3407	1686246.9874
151	682877.4700	1686734.1690	4094.84	OT-C533-LEACH-NG	682679.5577	1686245.3179

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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
152	682871.6400	1686736.6530	4094.83	OT-C533-LEACH-NG	682673.7294	1686247.8011
153	682869.4200	1686738.9370	4094.89	OT-C533-LEACH-NG	682671.5100	1686250.0845
154	682868.8760	1686741.4810	4094.99	OT-C533-LEACH-NG	682670.9662	1686252.6277
155	682867.8710	1686756.1100	4095.03	OT-C533-LEACH-NG	682669.9615	1686267.2525
156	682857.6950	1686766.0680	4095.35	OT-C533-LEACH-NG	682659.7884	1686277.2076
157	682855.8760	1686772.9280	4095.39	OT-C533-LEACH-NG	682657.9700	1686284.0656
158	682855.6590	1686783.4130	4095.46	OT-C533-LEACH-NG	682657.7530	1686294.5476
159	682855.5230	1686790.0690	4095.47	OT-C533-LEACH-NG	682657.6171	1686301.2017
160	682857.2270	1686794.8730	4095.42	OT-C533-LEACH-NG	682659.3206	1686306.0043
161	682858.6900	1686813.7880	4095.55	OT-C533-LEACH-NG	682660.7832	1686324.9138
162	682867.9360	1686816.7350	4095.32	OT-C533-LEACH-NG	682670.0265	1686327.8599
163	682880.0660	1686814.6740	4095.00	OT-C533-LEACH-NG	682682.1530	1686325.7995
164	682891.9700	1686818.7840	4094.82	OT-C533-LEACH-NG	682694.0535	1686329.9083
165	682901.1340	1686806.7570	4094.86	OT-C533-LEACH-NG	682703.2148	1686317.8848
166	682889.7110	1686785.0140	4094.98	OT-C533-LEACH-NG	682691.7952	1686296.1481
167	682889.3190	1686757.8750	4094.96	OT-C533-LEACH-NG	682691.4033	1686269.0170
168	682886.6550	1686745.7080	4094.83	OT-C533-LEACH-NG	682688.7400	1686256.8535
169	682895.8900	1686814.7130	4095.19	OT-C533-FFLUEN-NG	682697.9724	1686325.8385
170	682901.8890	1686814.2530	4095.86	OT-C533-FFLUEN-TPAD	682703.9696	1686325.3787
171	682901.5970	1686811.8220	4095.84	OT-C533-SEPTIC-TCONC	682703.6777	1686322.9484
172	682911.5820	1686810.3750	4095.77	OT-C533-SEPTIC-TCONC	682713.6598	1686321.5018
173	682912.4280	1686815.4170	4095.77	OT-C533-SEPTIC-TCONC	682714.5056	1686326.5423
174	682902.3730	1686816.8390	4095.84	OT-C533-SEPTIC-TCONC	682704.4535	1686327.9639
175	682912.0910	1686812.7560	4095.77	OT-C533-EFLUEN-TCONC	682714.1687	1686323.8821
176	682923.3600	1686810.9450	4095.29	OT-C533-EFLUEN-NG	682725.4344	1686322.0716
177	682942.2940	1686810.3140	4095.49	OT-C533-EFLUEN-NG	682744.3629	1686321.4408
178	682937.5080	1686805.9000	4095.30	OT-C533-STATION1-NG	682739.5783	1686318.0278
179	682906.2780	1686808.8380	4094.86	OT-C533-STATION2-NG	682708.3574	1686319.9652
180	682895.2770	1686813.2080	4094.98	OT-C533-STATION3-NG	682697.3595	1686324.3340
181	700191.9570	1695605.3730	4181.72	OT-C540-STATION1-ASP	699989.0266	1695113.9508
182	700173.9260	1695611.2520	4181.82	OT-C540-STATION2-NG	699971.0008	1695119.8281
183	700168.8930	1695604.5390	4181.39	OT-C540-STATION3-NG	699965.9693	1695113.1170
184	700151.2700	1695598.6630	4180.49	OT-C540-STATION4-NG	699948.3514	1695107.2427
185	700158.9630	1695593.9090	4180.86	OT-C540-LEACH-NG	699956.0422	1695102.4901
186	700150.2560	1695603.0840	4180.78	OT-C540-LEACH-NG	699947.3377	1695111.6625
187	700152.8330	1695609.6400	4180.81	OT-C540-LEACH-NG	699949.9139	1695118.2166
188	700155.1660	1695611.7200	4180.89	OT-C540-LEACH-NG	699952.2463	1695120.2960
189	700161.1020	1695611.3470	4181.11	OT-C540-LEACH-NG	699958.1805	1695119.9231
190	700163.7200	1695601.1600	4181.06	OT-C540-LEACH-NG	699960.7978	1695109.7390
191	700161.5790	1695596.1920	4181.05	OT-C540-LEACH-NG	699958.6574	1695104.7725
192	700165.7400	1695603.7570	4181.48	OT-C540-FFLUEN-NG	699962.8172	1695112.3353
193	700170.8520	1695608.8530	4181.93	OT-C540-FFLUEN-NG	699967.9277	1695117.4298
194	700170.7290	1695606.7600	4182.01	OT-C540-SEPTIC-NG	699967.8048	1695115.3374
195	700176.8760	1695605.4490	4181.91	OT-C540-SEPTIC-NG	699973.9500	1695114.0268
196	700177.5910	1695612.4300	4181.92	OT-C540-SEPTIC-NG	699974.6648	1695121.0058
197	700172.1930	1695613.9030	4182.05	OT-C540-SEPTIC-NG	699969.2683	1695122.4783
198	700177.7030	1695608.9790	4181.69	OT-C540-EFLUEN-NG	699974.7767	1695117.5558
199	700205.8220	1695608.1850	4181.85	OT-C540-EFLUEN-ASPH	700002.8876	1695116.7620
200	700246.4300	1695613.4690	4182.95	OT-C540-EFLUEN-ASPH	700043.4838	1695122.0445
201	700238.4930	1695614.0360	4182.51	OT-C540-BLDGCOR	700035.5491	1695122.6113
202	700228.4390	1695608.1640	4182.55	OT-C540-BLDGCOR	700025.4980	1695116.7410
203	700227.0510	1695568.0300	4182.87	OT-C540-BLDGCOR	700024.1104	1695076.6186
204	700236.9380	1695557.6950	4183.02	OT-C540-BLDGCOR	700033.9946	1695066.2866
205	688305.7410	1690609.5510	4126.46	TU\US-C507-STATION1-	688106.2555	1690119.5767
206	688309.7220	1690614.0760	4126.51	TU\US-C507-STATION2-	688110.2353	1690124.1004
207	688306.7130	1690619.4150	4126.45	TU\US-C507-STATION3-	688107.2272	1690129.4378
208	688313.7000	1690621.8280	4126.37	TU\US-C507-STATION4-	688114.2122	1690131.8501
209	688313.7950	1690607.6410	4126.36	TU\US-C507-STATION5-	688114.3071	1690117.6673
210	688304.0140	1690620.9730	4126.47	TU\US-C507-USTPIT-AS	688104.5290	1690130.9954
211	688304.3040	1690607.3010	4126.54	TU\US-C507-USTPIT-AS	688104.8189	1690117.3274
212	688317.4320	1690607.1780	4126.54	TU\US-C507-USTPIT-AS	688117.9431	1690117.2044
213	688317.6000	1690622.2860	4126.57	TU\US-C507-USTPIT-AS	688118.1110	1690132.3080
214	688320.7590	1690623.9670	4127.18	TU\US-C507-BLDGCOR	688121.2691	1690133.9885
215	688330.7630	1690627.7570	4125.65	TU\US-C507-BLDGCOR	688131.2702	1690137.7774
216	688318.5520	1690598.7120	4126.71	TU\US-C507-BLDGCOR	688119.0628	1690108.7408
217	688306.5580	1690598.9520	4126.69	TU\US-C507-BLDGCOR	688107.0722	1690108.9808
218	688287.5740	1690592.3200	4126.83	TU\US-C507-EXMW1	688088.0937	1690102.3507
219	688287.4600	1690625.9270	4126.36	TU\US-C507-EXMW2	688087.9798	1690135.9480
220	689216.8690	1680453.8850	4087.76	TU\US-C501-STATION4-	689017.1194	1679966.8540
221	689203.4000	1680450.4300	4087.80	TU\US-C501-STATION1-	689003.6543	1679963.4000
222	689227.9170	1680449.2880	4087.78	TU\US-C501-STATION2-	689028.1642	1679962.2584

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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
223	689201.2820	1680437.6020	4087.96	TU\US-C501-STATION3-	689001.5369	1679950.5757
224	689204.0090	1680426.7550	4087.80	TU\US-C501-STATION5-	689004.2631	1679939.7319
225	689200.5240	1680440.6650	4087.95	TU\US-C501-BLDGCOR-N	689000.7792	1679953.6379
226	689191.1430	1680432.8740	4088.07	TU\US-C501-BLDGCOR-N	688991.4009	1679945.8491
227	689202.0960	1680449.8730	4087.79	TU\US-C501-TANKPIT-N	689002.3507	1679962.8432
228	689201.5860	1680440.8210	4087.99	TU\US-C501-TANKPIT-N	689001.8408	1679953.7938
229	689191.7450	1680432.9310	4088.07	TU\US-C501-TANKPIT-N	688992.0027	1679945.9061
230	689195.4710	1680423.1750	4087.88	TU\US-C501-TANKPIT-N	688995.7276	1679936.1529
231	689207.1960	1680422.4490	4087.92	TU\US-C501-TANKPIT-N	689007.4492	1679935.4271
232	689229.2900	1680431.3210	4087.77	TU\US-C501-TANKPIT-N	689029.5368	1679944.2966
233	689231.6150	1680444.1310	4087.67	TU\US-C501-TANKPIT-N	689031.8611	1679957.1029
234	689227.5450	1680454.7320	4087.83	TU\US-C501-TANKPIT-N	689027.7923	1679967.7008
235	689218.0540	1680463.3780	4088.03	TU\US-C501-TANKPIT-N	689018.3041	1679976.3443
236	689209.0460	1680458.6260	4087.92	TU\US-C501-TANKPIT-N	689009.2987	1679971.5937
237	689237.1630	1680445.1670	4087.64	TU\US-C501-COMMLINE-	689037.4075	1679958.1386
238	689219.6050	1680436.9770	4088.00	TU\US-C501-COMMLINE-	689019.8546	1679949.9509
239	689199.7540	1680431.6770	4088.06	TU\US-C501-COMMLINE-	689000.0094	1679944.6525
240	689181.3550	1680425.0490	4088.20	TU\US-C501-COMMLINE-	688981.6157	1679938.0264
241	689162.6180	1680417.3900	4088.35	TU\US-C501-COMMLINE-	688962.8841	1679930.3696
242	689161.5970	1680417.5650	4088.56	TU\US-C501-COMMVAULT	688961.8634	1679930.5446
243	689157.8580	1680421.3400	4088.11	TU\US-C501-COMMVAULT	688958.1255	1679934.3185
244	689150.8680	1680414.5760	4088.10	TU\US-C501-COMMVAULT	688951.1375	1679927.5564
245	689154.6050	1680410.8830	4088.46	TU\US-C501-COMMVAULT	688954.8735	1679923.8645
246	687246.6430	1686873.0010	4105.82	OT-C535-STATION1-NG	687047.4644	1686384.1096
247	687270.5400	1686861.6690	4105.63	OT-C535-STATION2-NG	687071.3545	1686372.7809
248	687282.8340	1686866.7860	4105.85	OT-C535-STATION3-NG	687083.6449	1686377.8964
249	687303.5940	1686788.5490	4105.12	OT-C535-STATION4-NG	687104.3989	1686299.6821
250	687291.9640	1686793.7970	4105.27	OT-C535-LEACH-NG	687092.7723	1686304.9286
251	687304.7930	1686782.8770	4105.17	OT-C535-LEACH-NG	687105.5976	1686294.0117
252	687323.6740	1686798.1880	4105.34	OT-C535-LEACH-NG	687124.4731	1686309.3183
253	687319.7080	1686817.5380	4105.82	OT-C535-LEACH-NG	687120.5083	1686328.6627
254	687307.4400	1686838.9610	4105.76	OT-C535-LEACH-NG	687108.2438	1686350.0795
255	687297.0830	1686856.5380	4106.04	OT-C535-LEACH-NG	687097.8898	1686367.6514
256	687290.0540	1686837.9200	4105.59	OT-C535-LEACH-NG	687090.8628	1686349.0388
257	687291.3760	1686806.0200	4105.33	OT-C535-LEACH-NG	687092.1845	1686317.1480
258	687284.5890	1686864.5150	4106.11	OT-C535-FFLUEN-NG	687085.3994	1686375.6261
259	687276.8290	1686868.4490	4106.19	OT-C535-FFLUEN-NG	687077.6417	1686379.5589
260	687276.0820	1686870.8490	4106.28	OT-C535-SEPTIC-NG	687076.8949	1686381.9583
261	687263.3720	1686869.7190	4105.87	OT-C535-SEPTIC-NG	687064.1886	1686380.8286
262	687263.7200	1686863.5770	4105.95	OT-C535-SEPTIC-NG	687064.5365	1686374.6884
263	687276.4840	1686862.8870	4106.07	OT-C535-SEPTIC-NG	687077.2968	1686373.9986
264	687263.5270	1686868.1150	4105.92	OT-C535-EFLUEN-NG	687064.3435	1686379.2250
265	687228.9570	1686874.1570	4105.71	OT-C535-EFLUEN-NG	687029.7836	1686385.2653
266	687235.2230	1686881.4610	4106.05	OT-C535-BLDGCOR-NG	687036.0477	1686392.5672
267	687225.9150	1686892.3360	4105.90	OT-C535-BLDGCOR-NG	687026.7424	1686403.4390
268	687232.0250	1686844.5370	4105.92	OT-C535-BLDGCOR-NG	687032.8507	1686355.6539
269	687221.4890	1686835.3400	4105.63	OT-C535-BLDGCOR-NG	687022.3177	1686346.4595
270	677637.2460	1692755.6660	4110.24	TU/US-C505-MW1-CASIN	677440.8524	1692265.0697
271	677636.9990	1692755.6590	4109.84	TU/US-C505-MW1-PVC	677440.6055	1692265.0627
272	677634.4160	1692722.3930	4110.42	TU/US-C505-WELLATEMP	677438.0233	1692231.8064
273	677659.4620	1692742.2400	4110.34	TU/US-C505-WELLATEMP	677463.0620	1692251.6476
274	677701.9500	1692799.3200	4110.17	TU/US-C505-USTPIT-NG	677505.5377	1692308.7111
275	677701.3830	1692789.3010	4110.35	TU/US-C505-USTPIT-NG	677504.9708	1692298.6950
276	677711.5570	1692789.5280	4110.64	TU/US-C505-USTPIT-NG	677515.1419	1692298.9219
277	677710.8940	1692799.1130	4110.24	TU/US-C505-USTPIT-NG	677514.4791	1692308.5041
278	677707.4060	1692790.0820	4110.35	TU/US-C505-STATION1-	677510.9921	1692299.4757
279	677702.3100	1692795.0710	4110.20	TU/US-C505-STATION2-	677505.8976	1692304.4633
280	677705.6610	1692797.9500	4110.13	TU/US-C505-STATION3-	677509.2476	1692307.3415
281	677710.4770	1692793.8740	4110.09	TU/US-C505-STATION4-	677514.0622	1692303.2666
282	677706.4200	1692793.8350	4110.12	TU/US-C505-STATION5-	677510.0064	1692303.2276
283	677694.5060	1692779.7220	4110.88	TU/US-C505-BLDGCOR-N	677498.0958	1692289.1187
284	677704.1940	1692790.4680	4110.28	TU/US-C505-BLDGCOR-N	677507.7810	1692299.8616
285	677754.5670	1692783.0890	4110.79	TU/US-C505-BLDGCOR-N	677558.1394	1692292.4848
286	677743.8570	1692795.1680	4110.70	TU/US-C505-BLDGCOR-N	677547.4325	1692304.5603
287	686300.2320	1672933.0350	4060.98	OT-C542-MW-CASING-	686101.3277	1672448.1837
288	686300.2350	1672933.0550	4060.98	OT-C542-MW-PVC	686101.3307	1672448.2037
289	686274.4020	1672914.6520	4061.01	OT-C542-LEACH-NG	686075.5052	1672429.8061
290	686289.6710	1672938.5250	4060.76	OT-C542-LEACH-NG	686090.7698	1672453.6721
291	686294.6900	1672941.1720	4060.83	OT-C542-LEACH-NG	686095.7873	1672456.3184
292	686301.6970	1672938.9490	4060.85	OT-C542-LEACH-NG	686102.7923	1672454.0960
293	686305.7170	1672936.2850	4060.87	OT-C542-LEACH-NG	686106.8111	1672451.4328

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
294	686308.0670	1672931.0550	4060.89	OT-C542-LEACH-NG	686109.1604	1672446.2043
295	686304.8000	1672917.9090	4060.82	OT-C542-LEACH-NG	686105.8944	1672433.0621
296	686292.3740	1672901.2590	4060.90	OT-C542-LEACH-NG	686093.4720	1672416.4169
297	686283.4190	1672906.7050	4060.97	OT-C542-FFLUEN-NG	686084.5196	1672421.8614
298	686280.3770	1672902.6520	4060.94	OT-C542-FFLUEN-NG	686081.4785	1672417.8095
299	686276.9070	1672904.6420	4060.95	OT-C542-SEPTIC-NG	686078.0095	1672419.7990
300	686271.2980	1672896.9550	4060.80	OT-C542-SEPTIC-NG	686072.4021	1672412.1142
301	686281.9530	1672889.9350	4060.83	OT-C542-SEPTIC-NG	686083.0540	1672405.0962
302	686287.0950	1672896.6800	4060.88	OT-C542-SEPTIC-NG	686088.1945	1672411.8393
303	686285.7900	1672894.7150	4060.83	OT-C542-EFLUEN-NG	686086.8899	1672409.8748
304	686299.2270	1672887.1560	4060.87	OT-C542-EFLUEN-NG	686100.3230	1672402.3180
305	686310.9860	1672881.5880	4061.18	OT-C542-EFLUEN-NG	686112.0786	1672396.7516
306	686294.2970	1672858.0380	4060.90	OT-C542-BLDGCOR-NG	686095.3944	1672373.2085
307	686295.8820	1672844.1310	4061.28	OT-C542-BLDGCOR-NG	686096.9790	1672359.3055
308	686345.1390	1672922.4560	4060.89	OT-C542-BLDGCOR-NG	686146.2217	1672437.6078
309	686358.9780	1672924.0940	4061.42	OT-C542-BLDGCOR-NG	686160.0567	1672439.2453
310	686291.8860	1672885.1500	4060.65	OT-C542-STATION1-NG	686092.9841	1672400.3126
311	686275.2730	1672891.5340	4060.63	OT-C542-STATION2-NG	686076.3760	1672406.6948
312	686281.5390	1672904.6340	4060.73	OT-C542-STATION2-NG	686082.6401	1672419.7910
313	685750.1690	1671530.2910	4055.60	OT-C543-STATION2-NG	685551.4241	1671045.8463
314	685734.0730	1671548.8090	4055.84	OT-C543-STATION2	685535.3328	1671064.3589
315	685727.7350	1671514.3350	4055.33	OT-C543-STATION3	685528.9966	1671029.8949
316	685749.4390	1671546.6740	4055.91	OT-C543-EXSEPTIC	685550.6944	1671062.2245
317	685732.6430	1671545.5190	4055.74	OT-C543-EXSEPTIC	685533.9032	1671061.0699
318	685741.2600	1671557.0720	4056.32	OT-C543-EXSEPTIC	685542.5177	1671072.6195
319	685738.1510	1671537.7290	4055.62	OT-C543-EXSEPTIC	685539.4096	1671053.2821
320	685734.3520	1671541.2760	4055.65	OT-C543-FFLUEN	685535.6117	1671056.8281
321	685716.0920	1671515.5090	4055.04	OT-C543-FFLUEN	685517.3570	1671031.0686
322	685708.2650	1671520.5800	4055.23	OT-C543-LEACH	685509.5323	1671036.1381
323	685688.3040	1671512.0560	4055.52	OT-C543-LEACH	685489.5771	1671027.6166
324	685669.5610	1671502.3840	4055.36	OT-C543-LEACH	685470.8395	1671017.9474
325	685659.9210	1671495.2130	4055.04	OT-C543-LEACH	685461.2023	1671010.7784
326	685670.4020	1671495.5660	4055.43	OT-C543-MW-CASING	685471.6803	1671011.1313
327	685670.1370	1671495.6580	4055.13	OT-C543-MW-PVC	685471.4153	1671011.2233
328	685682.2550	1671485.7460	4055.16	OT-C543-LEACH	685483.5298	1671001.3142
329	685699.8070	1671491.2750	4054.76	OT-C543-LEACH	685501.0767	1671006.8416
330	685710.4840	1671499.0550	4055.06	OT-C543-LEACH	685511.7506	1671014.6193
331	685721.5030	1671508.4730	4055.40	OT-C543-LEACH	685522.7664	1671024.0346
332	685794.8190	1671498.3320	4056.84	OT-C543-EFLUEN	685596.0612	1671013.8965
333	685809.3600	1671495.0820	4059.27	OT-C543-BLDGCOR	685610.5980	1671010.6475
334	685776.9050	1671465.9090	4060.02	OT-C543-BLDGCOR	685578.1524	1670981.4829
335	685785.4230	1671455.8900	4060.26	OT-C543-BLDGCOR	685586.6679	1670971.4668
336	685744.8400	1671542.1950	4055.76	OT-C543-EFLUEN	685546.0967	1671057.7468
337	685303.6520	1671072.3550	4048.79	OT-C544-MW-CASING	685105.0365	1670588.0430
338	685303.3550	1671072.2840	4048.52	OT-C544-MW-PVC	685104.7396	1670587.9720
339	685349.4970	1671083.9730	4052.43	OT-C544-STATION1	685150.8683	1670599.6576
340	685342.4960	1671086.5980	4051.55	OT-C544-STATION1	685143.8693	1670602.2819
341	685336.0530	1671085.0120	4050.99	OT-C544-STATION1	685137.4282	1670600.6963
342	685336.7000	1671089.5480	4051.15	OT-C544-SEPTIC	685138.0750	1670605.2310
343	685338.4520	1671075.7050	4051.30	OT-C544-SEPTIC	685139.8265	1670591.3920
344	685347.8050	1671077.3720	4052.23	OT-C544-SEPTIC	685149.1768	1670593.0585
345	685345.6600	1671089.9410	4052.38	OT-C544-SEPTIC	685147.0324	1670605.6239
346	685356.1020	1671079.9660	4041.22	OT-C544-EFLUEN	685157.4713	1670595.6518
347	685347.2700	1671081.8770	4052.36	OT-C544-EFLUEN	685148.6419	1670597.5622
348	685337.4940	1671082.4320	4051.31	OT-C544-FFLUEN	685138.8687	1670598.1171
349	685335.1290	1671082.2690	4051.14	OT-C544-FFLUEN	685136.5044	1670597.9541
350	685336.2280	1671075.8560	4050.85	OT-C544-LEACH	685137.6031	1670591.5430
351	685323.3310	1671071.0830	4049.91	OT-C544-LEACH	685124.7098	1670586.7714
352	685297.8990	1671068.1360	4048.16	OT-C544-LEACH	685099.2852	1670583.8252
353	685296.9990	1671078.2660	4047.94	OT-C544-LEACH	685098.3855	1670593.9523
354	685317.0900	1671090.9580	4049.62	OT-C544-LEACH	685118.4707	1670606.6406
355	685334.6940	1671090.0750	4050.81	OT-C544-LEACH	685136.0696	1670605.7579
356	685360.4020	1671127.4140	4053.89	OT-C544-BLDGCOR	685161.7701	1670643.0860
357	685349.8450	1671114.5020	4052.32	OT-C544-BLDGCOR	685151.2162	1670630.1778
358	685360.3480	1671033.1240	4052.96	OT-C544-BLDGCOR	685161.7161	1670548.8234
359	685371.1230	1671022.2010	4053.70	OT-C544-BLDGCOR	685172.4880	1670537.9035
360	669828.5970	1693339.1960	4077.44	TU/US-C503-STATION1	669634.4665	1692848.4306
361	669823.8520	1693340.4930	4077.30	TU/US-C503-STATION2	669629.7229	1692849.7272
362	669816.1660	1693331.0930	4077.32	TU/US-C503-STATION3	669622.0391	1692840.3299
363	669804.9830	1693324.1990	4077.14	TU/US-C503-STATION5	669610.8594	1692833.4379
364	669830.2120	1693344.6950	4077.63	TU/US-C503-STATION4	669636.0811	1692853.9280

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
365	669820.3680	1693343.5050	4078.10	TU/US-C503-USTTANK	669626.2399	1692852.7383
366	669826.9160	1693337.2450	4077.78	TU/US-C503-USTTANK	669632.7860	1692846.4802
367	669831.7020	1693342.9300	4077.73	TU/US-C503-USTTANK	669637.5706	1692852.1635
368	669817.5060	1693300.2710	4077.28	TU/US-C503-BLDGCOR	669623.3788	1692809.5169
369	669817.0280	1693314.4610	4077.69	TU/US-C503-BLDGCOR	669622.9009	1692823.7028
370	669870.4630	1693326.6030	4077.24	TU/US-C503-BLDGCOR	669676.3204	1692835.8412
371	669857.6770	1693326.9550	4077.12	TU/US-C503-BLDGCOR	669663.5381	1692836.1931
372	669799.9830	1693280.8270	4076.53	TU/US-C503-BLDGCOR	669605.8608	1692790.0785
373	669786.0040	1693280.0690	4077.00	TU/US-C503-BLDGCOR	669591.8859	1692789.3207
374	669753.1970	1693299.5360	4076.55	TU/US-C503-MW1-CASIN	669559.0884	1692808.7821
375	669753.0160	1693299.6510	4076.22	TU/US-C503-MW1-PVC	669558.9075	1692808.8971
376	669717.9520	1693348.6000	4074.92	TU/US-C503-MW3-PVC	669523.8536	1692857.8319
377	669718.0930	1693348.2730	4075.65	TU/US-C503-MW3-CASIN	669523.9946	1692857.5050
378	669746.8950	1693329.2100	4076.92	TU/US-C503-BLDGCOR	669552.7882	1692838.4475
379	669747.5820	1693308.1150	4076.21	TU/US-C503-BLDGCOR	669553.4750	1692817.3586
380	669906.5180	1693361.1640	4077.43	TU/US-C503-MW2-CASIN	669712.3650	1692870.3922
381	669906.2520	1693361.2650	4077.07	TU/US-C503-MW2-PVC	669712.0990	1692870.4932
382	669887.0390	1693344.8910	4077.53	TU/US-C503-BLDGCOR	669692.8916	1692854.1239
383	669886.0230	1693359.0930	4077.99	TU/US-C503-BLDGCOR	669691.8759	1692868.3218
384	670862.3470	1691695.2520	4072.78	TU/US-C500-MW1-CASIN	670667.9169	1691204.9630
385	670862.1340	1691695.4850	4072.39	TU/US-C500-MW1-PVC	670667.7040	1691205.1960
386	670897.1420	1691671.0590	4072.25	TU/US-C500-MW2-PVC	670702.7019	1691180.7771
387	670897.3420	1691670.8340	4072.66	TU/US-C500-MW2-CASIN	670702.9018	1691180.5521
388	670997.2710	1691721.0890	4072.90	TU/US-C500-MW3-CASIN	670802.8018	1691230.7926
389	670996.9840	1691721.2540	4072.41	TU/US-C500-MW3-PVC	670802.5149	1691230.9575
390	670952.1640	1691699.4910	4072.04	TU/US-C500-STATION1	670757.7079	1691209.2008
391	670948.0960	1691682.1740	4072.36	TU/US-C500-STATION4	670753.6411	1691191.8888
392	670936.4590	1691683.8290	4072.05	TU/US-C500-STATION5	670742.0075	1691193.5434
393	670929.6330	1691690.0950	4072.11	TU/US-C500-STATION2	670735.1834	1691199.8075
394	670923.0530	1691673.0510	4072.18	TU/US-C500-STATION3	670728.6054	1691182.7685
395	670946.5050	1691708.7370	4072.40	TU/US-C500-USTPIT	670752.0506	1691218.4441
396	670961.7540	1691693.8260	4072.62	TU/US-C500-USTPIT	670767.2951	1691203.5375
397	670931.1680	1691662.3970	4072.93	TU/US-C500-USTPIT	670736.7180	1691172.1176
398	670915.4940	1691676.4560	4072.43	TU/US-C500-USTPIT	670721.0485	1691186.1725
399	670921.7940	1691667.6910	4072.61	TU/US-C500-BLDGCOR	670727.3467	1691177.4100
400	670938.3020	1691685.3670	4072.19	TU/US-C500-BLDGCOR	670743.8499	1691195.0809
401	670954.8550	1691686.5260	4072.52	TU/US-C500-BLDGCOR	670760.3981	1691196.2396
402	670964.2580	1691691.8600	4072.50	TU/US-C500-BLDGCOR	670769.7984	1691201.5720
403	670981.1410	1691692.8760	4072.84	TU/US-C500-BLDGCOR	670786.6765	1691202.5877
404	681138.2190	1690535.4430	4109.80	OT-C538-MW1-CASING	680940.8108	1690045.4902
405	681137.9660	1690535.5040	4109.43	OT-C538-MW1-PVC	680940.5579	1690045.5512
406	681154.3000	1690506.8540	4109.64	OT-C538-STATION3	680956.8871	1690016.9095
407	681170.7650	1690504.3700	4110.30	OT-C538-STATION2	680973.3473	1690014.4262
408	681207.7160	1690542.9160	4110.07	OT-C538-STATION1	681010.2876	1690052.9610
409	681171.2020	1690513.1430	4110.35	OT-C538-SEPTIC	680973.7842	1690023.1966
410	681160.8350	1690514.8700	4110.22	OT-C538-SEPTIC	680963.4202	1690024.9231
411	681157.5830	1690502.2430	4109.87	OT-C538-SEPTIC	680960.1692	1690012.2998
412	681168.6240	1690500.8410	4110.30	OT-C538-SEPTIC	680971.2070	1690010.8982
413	681157.7430	1690507.8780	4109.92	OT-C538-FFLUEN	680960.3291	1690017.9332
414	681149.7900	1690513.8560	4109.82	OT-C538-FFLUEN	680952.3784	1690023.9094
415	681146.2870	1690511.1610	4109.76	OT-C538-LEACH	680948.8764	1690021.2152
416	681140.0690	1690516.2140	4109.76	OT-C538-LEACH	680942.6602	1690026.2667
417	681131.8360	1690535.6580	4109.59	OT-C538-LEACH	680934.4296	1690045.7051
418	681142.3480	1690541.6090	4109.45	OT-C538-LEACH	680944.9386	1690051.6544
419	681148.4850	1690524.6340	4109.80	OT-C538-LEACH	680951.0738	1690034.6843
420	681152.9240	1690518.6140	4110.01	OT-C538-LEACH	680955.5115	1690028.6661
421	681171.0630	1690513.0040	4110.32	OT-C538-EFLUEN	680973.6453	1690023.0577
422	681199.3120	1690534.6340	4109.92	OT-C538-EFLUEN	681001.8861	1690044.6814
423	681311.9210	1690619.8910	4111.94	OT-C538-EFLUEN	681114.4624	1690129.9137
424	681378.0600	1690614.8720	4112.52	OT-C538-EFLUEN	681180.5823	1690124.8962
425	681511.9950	1690621.0250	4112.35	OT-C538-EFLUEN-C/O	681314.4785	1690131.0474
426	681543.8210	1690614.3290	4112.13	OT-C538-EFLUEN-C/O	681346.2952	1690124.3533
427	681545.1500	1690624.0320	4110.59	OT-C538-EFLUEN	681347.6238	1690134.0535
428	681526.9290	1690617.7410	4112.19	OT-C538-BLDGCOR	681329.4081	1690127.7643
429	681516.5600	1690627.6780	4112.22	OT-C538-BLDGCOR	681319.0421	1690137.6984
430	681517.0030	1690674.6590	4112.55	OT-C538-BLDGCOR	681319.4850	1690184.6658
431	681526.9640	1690685.0850	4112.68	OT-C538-BLDGCOR	681329.4431	1690195.0888
432	681610.3380	1690617.1910	4112.15	OT-C538-BLDGCOR	681412.7929	1690127.2145
433	681620.0290	1690626.9090	4112.29	OT-C538-BLDGCOR	681422.4811	1690136.9297
434	681248.7970	1690511.7190	4110.11	OT-C537-STATION1	681051.3567	1690021.7731
435	681230.2540	1690505.9940	4109.96	OT-C537-STATION2	681032.8191	1690016.0497

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
436	681220.0430	1690509.7920	4110.12	OT-C537-STATION3	681022.6111	1690019.8466
437	681224.9030	1690501.6020	4109.95	OT-C537-SEPTICDRY	681027.4697	1690011.6590
438	681224.2220	1690518.0560	4110.28	OT-C537-SEPTICDRY	681026.7889	1690028.1082
439	681236.7540	1690518.9910	4110.31	OT-C537-SEPTICDRY	681039.3172	1690029.0429
440	681236.4080	1690501.8520	4110.13	OT-C537-SEPTICDRY	681038.9713	1690011.9089
441	681237.2180	1690508.8330	4110.12	OT-C537-INLINE	681039.7811	1690018.8879
442	681311.7430	1690515.4440	4111.03	OT-C537-INLINE	681114.2845	1690025.4970
443	670561.7210	1680587.5740	4050.10	TU/US-C506-MW2-CASIN	670367.3781	1680100.5043
444	670561.4170	1680587.6760	4049.68	TU/US-C506-MW2-PVC	670367.0742	1680100.6062
445	670504.3430	1680580.0920	4050.14	TU/US-C506-MW1-PVC	670310.0167	1680093.0244
446	670504.5340	1680580.0020	4050.56	TU/US-C506-MW1-CASIN	670310.2076	1680092.9345
447	670508.2600	1680580.6030	4050.26	TU/US-C506-USTTANK	670313.9326	1680093.5353
448	670507.1490	1680575.9500	4050.27	TU/US-C506-USTTANK	670312.8219	1680088.8836
449	670517.9280	1680578.9030	4050.27	TU/US-C506-USTTANK	670323.5978	1680091.8358
450	670517.4300	1680574.2280	4050.28	TU/US-C506-USTTANK	670323.0999	1680087.1621
451	670507.9350	1680578.1630	4050.18	TU/US-C506-STATION1	670313.6077	1680091.0960
452	670513.3690	1680579.8330	4050.20	TU/US-C506-STATION2	670319.0401	1680092.7655
453	670517.9640	1680576.4150	4050.25	TU/US-C506-STATION3	670323.6338	1680089.3485
454	670511.2330	1680575.3810	4050.12	TU/US-C506-STATION4	670316.9047	1680088.3148
455	670512.5770	1680577.6370	4050.16	TU/US-C506-STATION5	670318.2483	1680090.5702
456	670485.1820	1680557.6150	4050.53	TU/US-C506-EXMW1-CAS	670290.8613	1680070.5540
457	670484.8980	1680557.6790	4050.38	TU/US-C506-EXMW1-PVC	670290.5773	1680070.6179
458	670494.8180	1680553.5430	4050.36	TU/US-C506-BLDGCOR	670300.4945	1680066.4831
459	670506.7310	1680561.7710	4050.38	TU/US-C506-BLDGCOR	670312.4040	1680074.7088
460	670510.1770	1680607.5970	4050.36	TU/US-C506-BLDGCOR	670315.8490	1680120.5215
461	670507.2460	1680618.1900	4050.39	TU/US-C506-BLDGCOR	670312.9189	1680131.1114
462	672564.5350	1692766.5990	4084.67	OT-C530-STATION1	672369.6116	1692275.9995
463	672567.1650	1692774.7240	4084.79	OT-C530-STATION2	672372.2409	1692284.1222
464	672567.5210	1692771.2850	4084.93	OT-C530-ACTSEPTIC	672372.5967	1692280.6842
465	672572.0780	1692767.3740	4084.89	OT-C530-ACTSEPTIC	672377.1524	1692276.7743
466	672575.8660	1692771.9070	4084.91	OT-C530-ACTSEPTIC	672380.9393	1692281.3060
467	672571.4280	1692775.8290	4084.95	OT-C530-ACTSEPTIC	672376.5026	1692285.2269
468	672569.6900	1692769.3550	4084.91	OT-C530-INLINE	672374.7651	1692278.7547
469	672563.6000	1692772.1360	4084.83	OT-C530-MW-CASING	672368.6769	1692281.5349
470	672563.2920	1692772.2960	4084.49	OT-C530-MW-PVC	672368.3690	1692281.6949
471	672509.9810	1692700.4750	4085.41	OT-C530-INLINE	672315.0734	1692209.8947
472	672538.3940	1692677.7240	4085.37	OT-C530-BLDGCOR	672343.4782	1692187.1503
473	672538.9710	1692663.8680	4085.27	OT-C530-BLDGCOR	672344.0550	1692173.2983
474	672478.3960	1692731.8290	4085.45	OT-C530-BLDGCOR	672283.4976	1692241.2396
475	672485.2490	1692739.1720	4085.12	OT-C530-BLDGCOR	672290.3486	1692248.5805
476	685978.3640	1686617.0530	4101.95	OT-C534-STATION1	685779.5530	1686128.2358
477	685949.9370	1686623.2970	4101.80	OT-C534-STATION2	685751.1342	1686134.4780
478	686041.6810	1686591.0650	4102.58	OT-C534-BLDGCOR	685842.8517	1686102.2553
479	686050.4200	1686580.6970	4102.78	OT-C534-BLDGCOR	685851.5881	1686091.8903
480	686053.7100	1686616.8100	4102.90	OT-C534-BLDGCOR	685854.8772	1686127.9929
481	686043.1140	1686607.6280	4102.82	OT-C534-BLDGCOR	685844.2842	1686118.8135
482	670482.5190	1680558.2400	4050.60	TU/US-C506-MW3-CASIN	670288.1990	1680071.1788
483	670482.3210	1680558.1750	4050.11	TU/US-C506-MW3-PVC	670288.0011	1680071.1138
484	669451.6250	1685381.2210	4054.88	TU/US-C515-STATION1	669257.6038	1684892.7620
485	669456.5920	1685373.9060	4054.66	TU/US-C515-STATION2	669262.5694	1684885.4491
486	669447.7270	1685364.3830	4054.13	TU/US-C515-STATION3	669253.7069	1684875.9289
487	669442.7430	1685375.3260	4054.34	TU/US-C515-STATION4	669248.7244	1684886.8687
488	669450.0780	1685373.9310	4054.62	TU/US-C515-STATION5	669256.0572	1684885.4741
489	669529.8630	1685390.3120	4053.57	TU/US-C515-MW3-PVC	669335.8191	1684901.8503
490	669530.0710	1685390.1630	4053.84	TU/US-C515-MW3-CASIN	669336.0271	1684901.7014
491	669347.3380	1685357.3580	4053.37	TU/US-C515-MW2-CASIN	669153.3470	1684868.9059
492	669347.0390	1685357.4240	4052.93	TU/US-C515-MW2-PVC	669153.0481	1684868.9719
493	669367.7310	1685396.1250	4053.43	TU/US-C515-MW1-PVC	669173.7341	1684907.6617
494	669368.0180	1685396.0880	4053.86	TU/US-C515-MW1-CASIN	669174.0210	1684907.6247
495	669413.7390	1685386.4140	4054.97	TU/US-C515-BLDGCOR	669219.7288	1684897.9535
496	669405.0760	1685397.5400	4056.39	TU/US-C515-BLDGCOR	669211.0683	1684909.0762
497	669442.6490	1685383.8010	4054.90	TU/US-C515-TANKPIT	669248.6304	1684895.3412
498	669458.4310	1685381.6630	4055.08	TU/US-C515-TANKPIT	669264.4078	1684893.2039
499	669454.7400	1685363.6010	4054.47	TU/US-C515-TANKPIT	669260.7179	1684875.1471
500	669440.8050	1685364.3540	4054.07	TU/US-C515-TANKPIT	669246.7869	1684875.8999
501	669474.3460	1685377.9770	4054.82	TU/US-C515-BLDGCOR	669280.3182	1684889.5189
502	669485.4880	1685386.3880	4055.07	TU/US-C515-BLDGCOR	669291.4570	1684897.9275
503	669257.8420	1685415.0700	4053.20	TU/US-C513-STATION3	669063.8770	1684926.6012
504	669241.6200	1685431.8260	4053.43	TU/US-C513-STATION2	669047.6597	1684943.3523
505	669234.6840	1685421.2410	4053.75	TU/US-C513-STATION5	669040.7257	1684932.7704
506	669232.2550	1685409.8190	4053.42	TU/US-C513-STATION4	669038.2974	1684921.3517

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

Corrections

Point #515
TU/US-515-MW3 PVC

Point #518
TU/US-515-MW2

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
507	669220.1400	1685422.8010	4053.52	TU/US-C513-STATION1	669026.1859	1684934.3299
508	669222.4590	1685431.2530	4053.64	TU/US-C513-TANKPIT	669028.5042	1684942.7795
509	669219.3990	1685411.0450	4054.92	TU/US-C513-TANKPIT	669025.4451	1684922.5773
510	669260.7320	1685426.0370	4053.70	TU/US-C513-TANKPIT	669066.7661	1684937.5650
511	669277.6950	1685433.5720	4053.31	TU/US-C513-MW2-CASIN	669083.7242	1684945.0978
512	669243.5650	1685418.8110	4054.36	TU/US-C513-TRANSPAD	669049.6041	1684930.3411
513	669236.4970	1685419.8090	4054.30	TU/US-C513-TRANSPAD	669042.5381	1684931.3388
514	669235.5680	1685411.9050	4054.57	TU/US-C513-TRANSPAD	669041.6094	1684923.4371
515	669277.6850	1685433.6210	4053.26	TU/US-C513-MW2-C[illegible] PVC	669083.7142	1684945.1468 → MW3
516	669188.9570	1685441.5400	4053.76	TU/US-C513-MW1-CASIN	668995.0119	1684953.0635
517	669188.7180	1685441.6230	4053.31	TU/US-C513-MW1-PVC	668994.7730	1684953.1465
518	669175.0530	1685411.5360	4053.78	TU/US-C513-MW3-PVC	668981.1120	1684923.0682 → MW2
519	669175.2900	1685411.4450	4054.15	TU/US-C513-MW3-CASIN	668981.3489	1684922.9772
520	669194.6820	1685411.4540	4054.72	TU/US-C513-BLDGCOR	669000.7353	1684922.9862
521	669205.8290	1685420.1440	4054.47	TU/US-C513-BLDGCOR	669011.8790	1684931.6737
522	669292.6520	1685418.3920	4053.83	TU/US-C513-BLDGCOR	669098.6769	1684929.9222
523	669293.9380	1685428.2990	4053.77	TU/US-C513-BLDGCOR	669099.9625	1684939.8263
524	685879.9040	1686627.7590	4102.02	OTC-534-CASING	685681.1215	1686138.9387
525	685879.6290	1686627.7910	4101.61	OTC-534-PVC	685680.8466	1686138.9707
526	685894.0510	1686651.2940	4102.15	OTC-534-MW6-CASING	685695.2644	1686162.4669
527	685893.7240	1686651.3020	4101.74	OTC-534-MW6-PVC	685694.9375	1686162.4749
528	685866.3710	1686655.8860	4101.59	OTC-534-MW8-PVC	685667.5925	1686167.0576
529	685866.6060	1686655.6520	4102.06	OTC-534-MW8-CASING	685667.8274	1686166.8236
530	685876.1160	1686687.3140	4102.11	OTC-534-MW5-CASING	685677.3346	1686198.4764
531	685875.8760	1686687.4250	4101.81	OTC-534-MW5-PVC	685677.0947	1686198.5874
532	685834.9910	1686704.4610	4101.83	OTC-534-MW9-PVC	685636.2216	1686215.6185
533	685835.2820	1686704.5300	4102.15	OTC-534-MW9-CASING	685636.5125	1686215.6875
534	685772.4780	1686595.2240	4101.45	OTC-534-MW10-NG	685573.7267	1686106.4131
535	669081.1480	1678793.1860	4046.72	OTC-531B-SEPTANK	668887.2342	1678306.6363
536	669082.4390	1678801.3130	4046.63	OTC-531B-SEPTANK	668888.5248	1678314.7610
537	669072.3810	1678802.9790	4046.81	OTC-531B-SEPTANK	668878.4697	1678316.4265
538	669070.8860	1678795.3530	4046.82	OTC-531B-SEPTANK	668876.9751	1678308.8027
539	669104.1410	1678787.7690	4045.69	OTC-531B-STATION-1	668910.2205	1678301.2209
540	669070.9690	1678801.9800	4046.52	OTC-531B-STATION-2	668877.0581	1678315.4278
541	669061.4820	1678787.2510	4046.24	OTC-531B-STATION-3	668867.5739	1678300.7031
542	669022.2810	1678760.4940	4045.98	OTC-531B-MW-1-PVC	668828.3842	1678273.9538
543	669022.4740	1678760.4670	4046.35	OTC-531B-MW-1-CASING	668828.5772	1678273.9268
544	669029.7060	1678750.8610	4046.12	OTC-531B-LEACH	668835.8071	1678264.3236
545	669044.0770	1678753.3070	4046.04	OTC-531B-LEACH	668850.1739	1678266.7689
546	669048.2090	1678762.3910	4046.19	OTC-531B-LEACH	668854.3047	1678275.8503
547	669052.8600	1678773.5200	4046.17	OTC-531B-LEACH	668858.9544	1678286.9760
548	669051.8580	1678782.0380	4046.19	OTC-531B-LEACH	668857.9527	1678295.4916
549	669045.9680	1678791.0410	4045.97	OTC-531B-LEACH	668852.0644	1678304.4920
550	669037.6080	1678787.3270	4046.05	OTC-531B-LEACH	668843.7068	1678300.7790
551	669030.8940	1678787.9690	4046.07	OTC-531B-LEACH	668836.9947	1678301.4208
552	669024.6850	1678794.4050	4045.99	OTC-531B-LEACH	668830.7875	1678307.8550
553	669012.0060	1678808.0140	4045.98	OTC-531B-LEACH	668818.1122	1678321.4600
554	669005.0390	1678788.3970	4045.95	OTC-531B-LEACH	668811.1472	1678301.8487
555	669008.1540	1678771.5710	4046.05	OTC-531B-LEACH	668814.2613	1678285.0276
556	669012.3090	1678761.0960	4046.10	OTC-531B-LEACH	668818.4151	1678274.5556
557	669052.5660	1678784.6580	4046.08	OTC-531B-FLINE	668858.6605	1678298.1108
558	669071.4380	1678798.9230	4046.55	OTC-531B-FLINE	668877.5270	1678312.3717
559	669082.2160	1678797.7200	4046.58	OTC-531B-ELINE	668888.3019	1678311.1690
560	669109.7160	1678792.3340	4045.64	OTC-531B-ELINE	668915.7939	1678305.7846
561	669130.6340	1678787.5660	4047.05	OTC-531B-ELINE	668936.7058	1678301.0180
562	669132.6960	1678800.0880	4046.87	OTC-531B-BLDGCOR	668938.7672	1678313.5363
563	669139.6540	1678804.9540	4046.97	OTC-531B-BLDGCOR	668945.7232	1678318.4009
564	669127.3740	1678771.5760	4046.72	OTC-531B-BLDGCOR	668933.4468	1678285.0326
565	669131.8520	1678764.6150	4047.25	OTC-531B-BLDGCOR	668937.9235	1678278.0736
566	668593.1300	1678901.9680	4046.19	OTC-531C-BLDGCOR	668399.3576	1678415.3868
567	668588.1250	1678902.8360	4046.21	OTC-531C-BLDGCOR	668394.3541	1678416.2546
568	668585.3350	1678865.5840	4046.55	OTC-531C-BLDGCOR	668391.5649	1678379.0133
569	668590.1110	1678858.6070	4046.53	OTC-531C-BLDGCOR	668396.3395	1678372.0384
570	668590.3090	1678889.4560	4045.95	OTC-531C-ELINE	668396.5374	1678402.8784
571	668578.4210	1678891.4650	4046.03	OTC-531C-ELINE	668384.6529	1678404.8868
572	668560.7680	1678894.7530	4045.47	OTC-531C-ELINE	668367.0050	1678408.1739
573	668535.6480	1678899.2930	4046.35	OTC-531C-ELINE	668341.8923	1678412.7126
574	668535.0660	1678896.4960	4046.68	OTC-531C-SEPTIC	668341.3104	1678409.9164
575	668535.3940	1678905.9700	4046.47	OTC-531C-SEPTIC	668341.6383	1678419.3876
576	668522.2510	1678906.9450	4046.51	OTC-531C-SEPTIC	668328.4992	1678420.3624
577	668522.3100	1678897.4040	4046.39	OTC-531C-SEPTIC	668328.5581	1678410.8241

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
578	668561.9930	1678890.5660	4045.66	OTC-531C-STATION-1	668368.2296	1678403.9881
579	668531.2500	1678902.0810	4046.55	OTC-531C-STATION-2	668337.4955	1678415.4998
580	668522.9580	1678893.5110	4045.84	OTC-531C-STATION-3	668329.2059	1678406.9323
581	668521.6100	1678902.7660	4046.16	OTC-531C-FLINE	668327.8583	1678416.1846
582	668515.2610	1678901.5740	4045.66	OTC-531C-FLINE	668321.5112	1678414.9929
583	668515.8520	1678907.4010	4045.67	OTC-531C-LEACH	668322.1020	1678420.8182
584	668498.6960	1678906.8280	4045.81	OTC-531C-LEACH	668304.9510	1678420.2454
585	668489.9270	1678907.6430	4045.74	OTC-531C-LEACH	668296.1845	1678421.0602
586	668481.5760	1678902.8790	4045.69	OTC-531C-LEACH	668287.8359	1678416.2975
587	668476.1180	1678891.3230	4045.84	OTC-531C-LEACH	668282.3795	1678404.7449
588	668473.4290	1678883.0340	4045.68	OTC-531C-LEACH	668279.6913	1678396.4583
589	668473.7340	1678874.2510	4045.53	OTC-531C-LEACH	668279.9962	1678387.6778
590	668476.2360	1678867.2340	4045.54	OTC-531C-LEACH	668282.4975	1678380.6629
591	668482.1720	1678868.3950	4045.45	OTC-531C-MW-1-PVC	668288.4318	1678381.8235
592	668482.4510	1678868.3680	4045.85	OTC-531C-MW-1-CASING	668288.7107	1678381.7965
593	668490.9400	1678863.0190	4045.60	OTC-531C-LEACH	668297.1972	1678376.4491
594	668503.3450	1678866.8310	4045.87	OTC-531C-LEACH	668309.5986	1678380.2600
595	668508.4050	1678874.1920	4045.93	OTC-531C-LEACH	668314.6572	1678387.6189
596	668515.8970	1678879.7420	4045.82	OTC-531C-LEACH	668322.1470	1678393.1672
597	668524.3970	1678890.3500	4045.70	OTC-531C-LEACH	668330.6445	1678403.7722
598	667495.6300	1679128.7300	4042.53	OTC-532-BLDGCOR	667302.1757	1678642.0831
599	667488.6400	1679123.9580	4042.71	OTC-532-BLDGCOR	667295.1877	1678637.3125
600	667462.6660	1679059.4970	4041.10	OTC-532-BLDGCOR	667269.2212	1678572.8701
601	667481.1840	1679050.1710	4042.61	OTC-532-BLDGCOR	667287.7339	1678563.5469
602	667486.0130	1679106.7520	4042.73	OTC-532-ELINE	667292.5615	1678620.1115
603	667462.4800	1679111.5030	4040.38	OTC-532-ELINE	667269.0353	1678624.8611
604	667462.2250	1679114.4150	4040.62	OTC-532-STATION-1	667268.7804	1678627.7722
605	667442.0090	1679119.1410	4041.24	OTC-532-STATION-2	667248.5702	1678632.4969
606	667419.1640	1679115.1840	4040.86	OTC-532-STATION-3	667225.7319	1678628.5410
607	667385.6930	1679101.6040	4040.50	OTC-532-STATION-4	667192.2706	1678614.9649
608	667381.8850	1679101.5680	4040.62	OTC-532-LEACH	667188.4637	1678614.9290
609	667383.6400	1679091.6130	4040.63	OTC-532-LEACH	667190.2181	1678604.9768
610	667385.4250	1679087.0370	4040.57	OTC-532-LEACH	667192.0026	1678600.4022
611	667388.9960	1679084.4040	4040.65	OTC-532-LEACH	667195.5726	1678597.7699
612	667394.2390	1679084.6140	4040.73	OTC-532-LEACH	667200.8141	1678597.9799
613	667396.1210	1679092.7430	4040.70	OTC-532-LEACH	667202.6955	1678606.1065
614	667398.1240	1679100.9150	4040.70	OTC-532-LEACH	667204.6979	1678614.2761
615	667402.2360	1679106.9240	4040.75	OTC-532-LEACH	667208.8088	1678620.2834
616	667410.1270	1679109.8530	4040.82	OTC-532-LEACH	667216.6975	1678623.2116
617	667419.4540	1679110.1630	4040.85	OTC-532-LEACH	667226.0218	1678623.5215
618	667420.7270	1679120.1400	4041.02	OTC-532-FLINE	667227.2944	1678633.4956
619	667423.8510	1679141.7780	4040.59	OTC-532-LEACH	667230.4175	1678655.1273
620	667412.2990	1679143.4760	4040.74	OTC-532-LEACH	667218.8688	1678656.8248
621	667403.7350	1679143.1670	4040.80	OTC-532-LEACH	667210.3073	1678656.5159
622	667397.0900	1679139.6510	4040.75	OTC-532-LEACH	667203.6642	1678653.0009
623	667384.3300	1679127.9250	4040.44	OTC-532-LEACH	667190.9079	1678641.2783
624	667382.6070	1679116.1130	4040.44	OTC-532-LEACH	667189.1854	1678629.4697
625	667430.4810	1679118.6630	4041.32	OTC-532-FLINE	667237.0456	1678632.0190
626	667430.2210	1679114.2980	4041.25	OTC-532-SEPTIC	667236.7856	1678627.6553
627	667440.5880	1679113.0200	4041.26	OTC-532-SEPTIC	667247.1496	1678626.3776
628	667442.9470	1679123.3120	4041.21	OTC-532-SEPTIC	667249.5080	1678636.6667
629	667430.1210	1679125.8580	4041.28	OTC-532-SEPTIC	667236.6857	1678639.2119
630	667441.8110	1679116.2010	4041.27	OTC-532-ELINE	667248.3723	1678629.5577
631	669659.5140	1678688.1920	4048.05	OTC-531A-ELINE	669465.4326	1678201.6728
632	669645.1200	1678691.4170	4047.42	OTC-531A-ELINE	669451.0427	1678204.8968
633	669626.5240	1678694.6570	4048.54	OTC-531A-ELINE	669432.4521	1678208.1359
634	669625.4550	1678690.5680	4048.58	OTC-531A-SEPTIC	669431.3834	1678204.0481
635	669627.0130	1678697.2200	4048.59	OTC-531A-SEPTIC	669432.9410	1678210.6981
636	669614.1180	1678700.1730	4048.60	OTC-531A-SEPTIC	669420.0497	1678213.6503
637	669613.0940	1678693.8150	4048.72	OTC-531A-SEPTIC	669419.0260	1678207.2941
638	669648.5430	1678685.0250	4047.24	OTC-531A-STATION-1	669454.4647	1678198.5067
639	669615.3510	1678691.9600	4048.59	OTC-531A-STATION-2	669421.2823	1678205.4397
640	669607.0140	1678691.1700	4048.42	OTC-531A-STATION-3	669412.9478	1678204.6499
641	669606.7200	1678688.2040	4048.56	OTC-531A-LEACH	669412.6539	1678201.6848
642	669608.9270	1678706.1330	4048.28	OTC-531A-LEACH	669414.8602	1678219.6086
643	669601.3790	1678707.8980	4048.13	OTC-531A-LEACH	669407.3144	1678221.3730
644	669593.2420	1678708.2220	4047.49	OTC-531A-LEACH	669399.1798	1678221.6970
645	669578.1380	1678708.5010	4047.22	OTC-531A-LEACH	669384.0801	1678221.9759
646	669565.0490	1678706.1840	4047.29	OTC-531A-LEACH	669370.9949	1678219.6595
647	669554.2260	1678694.3690	4047.37	OTC-531A-LEACH	669360.1751	1678207.8480
648	669553.4160	1678687.6760	4047.59	OTC-531A-LEACH	669359.3653	1678201.1569

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
649	669552.5940	1678678.4030	4047.76	OTC-531A-LEACH	669358.5435	1678191.8866
650	669550.0120	1678656.4050	4047.76	OTC-531A-LEACH	669355.9623	1678169.8950
651	669556.1880	1678652.3190	4047.86	OTC-531A-LEACH	669362.1365	1678165.8102
652	669559.2580	1678655.8340	4047.38	OTC-531A-MW-1-PVC	669365.2056	1678169.3241
653	669559.5100	1678655.7600	4047.78	OTC-531A-MW-1-CASING	669365.4575	1678169.2502
654	669561.9190	1678650.8880	4047.69	OTC-531A-LEACH	669367.8658	1678164.3796
655	669569.0970	1678659.8040	4048.02	OTC-531A-LEACH	669375.0418	1678173.2930
656	669574.5390	1678669.0420	4047.77	OTC-531A-LEACH	669380.4822	1678182.5283
657	669580.0480	1678677.6210	4047.77	OTC-531A-LEACH	669385.9896	1678191.1048
658	669581.1180	1678685.2190	4047.72	OTC-531A-LEACH	669387.0593	1678198.7006
659	669589.3790	1678690.0080	4047.91	OTC-531A-LEACH	669395.3179	1678203.4882
660	669598.7410	1678687.4540	4047.88	OTC-531A-LEACH	669404.6772	1678200.9350
661	669608.6000	1678697.8630	4048.38	OTC-531A-FLINE	669414.5333	1678211.3410
662	669613.4950	1678697.0050	4048.61	OTC-531A-FLINE	669419.4269	1678210.4832
663	669434.7190	1685385.1220	4055.15	US/TC-515-EXAVATION	669240.7027	1684896.6618
664	669433.7320	1685375.0770	4054.68	US/TC-515-EXAVATION	669239.7160	1684886.6198
665	669453.6100	1685372.2880	4054.89	US/TC-515-EXAVATION	669259.5882	1684883.8316
666	669455.2490	1685382.6100	4055.08	US/TC-515-EXAVATION	669261.2268	1684894.1506
667	669423.1290	1685379.3360	4054.73	US/TC-515-POTHOLE-1	669229.1161	1684890.8775
668	669443.7270	1685362.1260	4054.20	US/TC-515-POTHOLE-2	669249.7081	1684873.6725
669	669443.2340	1685352.4030	4053.69	US/TC-515-POTHOLE-3	669249.2152	1684863.9523
670	669388.8600	1685382.9350	4054.36	US/TC-515-POTHOLE-4	669194.8570	1684894.4755
671	666075.3380	1693454.3920	4059.75	US/TC-502-TANK/EX	665882.2953	1692963.5932
672	666064.5480	1693454.6090	4059.59	US/TC-502-TANK/EX	665871.5084	1692963.8101
673	666064.5890	1693463.2320	4059.66	US/TC-502-TANK/EX	665871.5494	1692972.4306
674	666075.7420	1693463.6580	4059.85	US/TC-502-TANK/EX	665882.6992	1692972.8565
675	666070.2430	1693458.8620	4059.56	US/TC-502-STATION-1	665877.2018	1692968.0619
676	666075.3470	1693459.1030	4059.61	US/TC-502-STATION-2	665882.3043	1692968.3028
677	666070.4890	1693455.0470	4059.46	US/TC-502-STATION-3	665877.4477	1692964.2480
678	666070.2650	1693463.1340	4059.49	US/TC-502-STATION-4	665877.2238	1692972.3327
679	666072.2440	1693503.2780	4060.12	US/TC-502-FIREHY	665879.2022	1693012.4650
680	669813.9600	1693315.1950	4077.70	US/TC-503-EXAVATION	669619.8338	1692824.4365
681	669826.0790	1693326.7460	4077.45	US/TC-503-EXAVATION	669631.9493	1692835.9842
682	669815.4720	1693337.1950	4077.67	US/TC-503-EXAVATION	669621.3454	1692846.4302
683	669803.8000	1693324.4750	4077.59	US/TC-503-EXAVATION	669609.6767	1692833.7139
684	669818.2990	1693319.1730	4077.48	US/TC-503-BEGTRENCH	669624.1715	1692828.4134
685	669837.0790	1693303.2490	4076.88	US/TC-503-ENDTRENCH	669642.9461	1692812.4940
686	681138.0180	1690539.4590	4109.33	OTC-538-STATION-5	680940.6098	1690049.5050
687	673758.3950	1683356.5480	4060.55	US/TC-514-STATION-1	673563.1256	1682868.6758
688	673765.5540	1683358.1250	4060.47	US/TC-514-STATION-2	673570.2825	1682870.2523
689	673770.0890	1683350.4240	4060.48	US/TC-514-STATION-3	673574.8162	1682862.5535
690	673768.2490	1683354.2670	4060.48	US/TC-514-STATION-4	673572.9768	1682866.3954
691	673777.4280	1683353.4050	4060.71	US/TC-514-STATION-5	673582.1531	1682865.5337
692	673776.8350	1683359.0390	4060.94	US/TC-514-BLDGCOR	673581.5603	1682871.1661
693	673769.7480	1683353.9100	4060.70	US/TC-514-BLDGCOR	673574.4753	1682866.0385
694	673778.8570	1683370.4750	4060.92	US/TC-514-BLDGCOR	673583.5817	1682882.5987
695	673773.9440	1683377.3380	4060.70	US/TC-514-BLDGCOR	673578.6701	1682889.4597
696	673723.3370	1683411.0030	4060.56	US/TC-514-MW-1-PVC	673528.0778	1682923.1150
697	673723.6160	1683410.9000	4061.02	US/TC-514-MW-1-CASIN	673528.3567	1682923.0120
698	673699.2890	1683380.7720	4061.09	US/TC-514-MW-2-CASIN	673504.0367	1682892.8928
699	673698.9660	1683380.8260	4060.66	US/TC-514-MW-2-PVC	673503.7138	1682892.9467
700	673812.5550	1683317.4880	4060.43	US/TC-514-MW-3-PVC	673617.2699	1682829.6271
701	673812.8820	1683317.4350	4060.76	US/TC-514-MW-3-CASIN	673617.5968	1682829.5741
702	673776.7270	1683350.1350	4060.82	US/TC-514-FORM/TANK	673581.4523	1682862.2646
703	673777.3420	1683356.4370	4060.94	US/TC-514-FORM/TANK	673582.0671	1682868.5648
704	673759.1130	1683359.4810	4061.06	US/TC-514-FORM/TANK	673563.8434	1682871.6079
705	673757.7990	1683353.3170	4061.32	US/TC-514-FORM/TANK	673562.5298	1682865.4457
706	678061.9490	1684350.2580	4078.63	US/TC-516-FORMTANK	677865.4323	1683862.0978
707	678072.0100	1684348.4740	4078.61	US/TC-516-FORMTANK	677875.4904	1683860.3143
708	678074.0860	1684360.1530	4078.25	US/TC-516-FORMTANK	677877.5658	1683871.9899
709	678065.1290	1684362.4260	4078.47	US/TC-516-FORMTANK	677868.6114	1683874.2622
710	678069.6040	1684359.8850	4078.30	US/TC-516-STATION-1	677873.0851	1683871.7220
711	678064.5960	1684356.9350	4078.34	US/TC-516-STATION-2	677868.0786	1683868.7728
712	678066.1670	1684350.4200	4078.54	US/TC-516-STATION-3	677869.6491	1683862.2597
713	678072.9250	1684354.8490	4078.09	US/TC-516-STATION-4	677876.4052	1683866.6874
714	678101.7280	1684311.2380	4077.72	US/TC-516-MW-2	677905.1998	1683823.0891
715	678116.9250	1684291.3650	4077.78	US/TC-516-MW-2	677920.3924	1683803.2218
716	678061.7680	1684335.2520	4080.38	US/TC-516-BLDGCOR	677865.2514	1683847.0961
717	678064.6310	1684348.2080	4081.07	US/TC-516-BLDGCOR	677868.1136	1683860.0484
718	678026.7560	1684390.7900	4078.49	US/TC-516-MW-1	677830.2495	1683902.6180
719	678014.0050	1684363.8290	4077.81	US/TC-516-MW-3	677817.5022	1683875.6648

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
720	671269.9880	1692357.3370	4075.08	US/TC-508-FORM/TANK	671075.4398	1691866.8562
721	671299.4450	1692330.8640	4075.18	US/TC-508-FORM/TANK	671104.8883	1691840.3908
722	671324.3300	1692358.5130	4075.17	US/TC-508-FORM/TANK	671129.7661	1691868.0318
723	671294.8560	1692384.8580	4075.02	US/TC-508-FORM/TANK	671100.3006	1691894.3692
724	671311.5950	1692346.0080	4075.12	US/TC-508-STATION-2	671117.0347	1691855.5304
725	671302.2680	1692357.1830	4075.07	US/TC-508-STATION-1	671107.7104	1691866.7022
726	671312.4640	1692368.2800	4074.98	US/TC-508-STATION-4	671117.9035	1691877.7960
727	671282.5110	1692369.9060	4075.01	US/TC-508-STATION-3	671087.9592	1691879.4215
728	671289.2400	1692342.4620	4075.15	US/TC-508-STATION-5	671094.6862	1691851.9855
729	671373.3210	1692386.6060	4075.00	US/TC-508-MW-3-PVC	671178.7429	1691896.1167
730	671373.6120	1692386.5000	4075.33	US/TC-508-MW-3-CASIN	671179.0338	1691896.0107
731	671216.9160	1692488.1670	4075.54	US/TC-508-SS18-MW08-CASIN	671022.3832	1691997.6482
732	671216.7110	1692488.4340	4075.26	US/TC-508-SS18-MW08-PVC	671022.1782	1691997.9152
733	671236.3110	1692301.9320	4075.19	US/TC-508-MW-2-CASIN	671041.7726	1691811.4672
734	671236.1240	1692302.1450	4074.80	US/TC-508-MW-2-PVC	671041.5856	1691811.6801
735	671211.3090	1692324.4610	4075.35	US/TC-508-MW-1-CASIN	671016.7778	1691833.9897
736	671211.0360	1692324.6620	4074.93	US/TC-508-MW-1-PVC	671016.5049	1691834.1906
737	671174.1880	1692241.9700	4074.81	US/TC-508-SS18-MW16-PVC	670979.6676	1691751.5226
738	671174.4770	1692241.7880	4075.34	US/TC-508-SS18-MW16-CASIN	670979.9565	1691751.3406
739	671035.8870	1692106.1030	4074.42	US/TC-508-SS18-MW18-CASIN	670841.4066	1691615.6950
740	671035.6230	1692106.3690	4073.74	US/TC-508-SS18-MW18-PVC	670841.1427	1691615.9609
741	671043.1730	1692355.2630	4075.73	US/TC-508-SS18-MW19-PVC	670848.6905	1691864.7828
742	670383.2120	1691278.5670	4072.57	US/TC-504-MW-2-CASIN	670188.9208	1690788.3988
743	670383.0220	1691278.7790	4072.19	US/TC-504-MW-2-PVC	670188.7309	1690788.6107
744	670343.7050	1691297.2270	4072.57	US/TC-504-MW-1-PVC	670149.4253	1690807.0534
745	670343.9460	1691296.8630	4072.80	US/TC-504-MW-1-CASIN	670149.6662	1690806.6895
746	669680.3630	1678704.0610	4048.54	OTC-531A-BLDGCOR	669486.2755	1678217.5372
747	669673.4280	1678699.1340	4048.44	OTC-531A-BLDGCOR	669479.3425	1678212.6116
748	669662.1160	1678671.3190	4048.32	OTC-531A-BLDGCOR	669468.0338	1678184.8047
749	669671.0810	1678657.6480	4048.29	OTC-531A-BLDGCOR	669476.9962	1678171.1376
750	669671.6690	1678686.6260	4048.54	OTC-531A-ELINE	669477.5840	1678200.1072
751	670995.2900	1691723.6540	4072.55	US/TC-500-STATION-6	670800.8214	1691233.3568
752	682707.7150	1693994.3080	4139.12	OTC-539-SEPTIC	682509.8519	1693503.3527
753	682707.1360	1693987.5070	4139.01	OTC-539-SEPTIC	682509.2731	1693496.5537
754	682713.9270	1693987.3840	4139.07	OTC-539-SEPTIC	682516.0621	1693496.4307
755	682714.4020	1693993.8490	4139.12	OTC-539-SEPTIC	682516.5370	1693502.8939
756	682710.5050	1693994.2530	4139.11	OTC-539-ELINE	682512.6411	1693503.2977
757	682711.7750	1694038.3560	4139.83	OTC-539-ELINE	682513.9107	1693547.3880
758	682709.6340	1694009.1330	4139.38	OTC-539-STATION-1	682511.7704	1693518.1734
759	682715.9010	1693990.7160	4139.12	OTC-539-STATION-2	682518.0355	1693499.7618
760	682707.9950	1693985.7400	4139.05	OTC-539-STATION-3	682510.1318	1693494.7872
761	682690.1540	1693966.7430	4138.58	OTC-539-STATION-4	682492.2960	1693475.7957
762	682700.5510	1693984.6270	4139.10	OTC-539-LEACH	682502.6900	1693493.6745
763	682694.7220	1693978.9800	4138.75	OTC-539-LEACH	682496.8627	1693488.0292
764	682685.8570	1693975.5370	4138.62	OTC-539-LEACH	682488.0002	1693484.5872
765	682686.8260	1693963.6500	4138.56	OTC-539-LEACH	682488.9690	1693472.7036
766	682690.9260	1693959.9730	4138.78	OTC-539-LEACH	682493.0678	1693469.0277
767	682696.9840	1693956.9410	4138.94	OTC-539-LEACH	682499.1240	1693465.9966
768	682705.4410	1693958.5980	4139.12	OTC-539-LEACH	682507.5786	1693467.6531
769	682714.7430	1693968.3290	4139.32	OTC-539-LEACH	682516.8779	1693477.3813
770	682721.4010	1693976.8710	4139.30	OTC-539-LEACH	682523.5339	1693485.9208
771	682717.7930	1693983.8070	4139.35	OTC-539-LEACH	682519.9270	1693492.8548
772	682710.1830	1693984.5790	4139.16	OTC-539-FLINE	682512.3192	1693493.6265
773	682710.2190	1693987.2160	4139.18	OTC-539-FLINE	682512.3552	1693496.2628
774	682690.6020	1694039.4720	4139.43	OTC-539-BLDGCOR	682492.7439	1693548.5036
775	682684.8200	1694045.5030	4139.27	OTC-539-BLDGCOR	682486.9635	1693554.5329
776	682741.4000	1694039.0240	4140.22	OTC-539-BLDGCOR	682543.5271	1693548.0558
777	682747.1830	1694045.0970	4140.68	OTC-539-BLDGCOR	682549.3085	1693554.1270

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7824
PROFESSIONAL SURVEYOR

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
778	686068.4560	1686694.7280	4103.68	OTC-534-MW-10-PVC	685869.6189	1686205.8883
779	686068.7800	1686694.7810	4104.06	OTC-534-MW-10-CASING	685869.9428	1686205.9413
780	685846.6180	1686522.2590	4102.52	OTC-534-MW-11-CASING	685647.8452	1686033.4693
781	685846.3620	1686522.2240	4102.15	OTC-534-MW-11-PVC	685647.5893	1686033.4343
782	685670.3280	1686561.9490	4102.29	OTC-534-MW-12-PVC	685471.6063	1686073.1478
783	685670.6410	1686561.9860	4102.69	OTC-534-MW-12-CASING	685471.9192	1686073.1848

RAW DATA

HOLLOMAN AIR FORCE BASE
WEST SITE

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	684793.2210	1611172.5300	3911.93	BASE	684598.9178	1610715.3759
2	682531.9480	1628747.6200	3965.57	EC-30	682338.2864	1628285.4792
3	682452.1330	1628714.0920	3957.20	EC-30-2	682258.4940	1628251.9607
4	698323.2620	1606321.3780	3915.08	CHAS	698125.1198	1605865.6004
5	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
60	616427.1730	1576921.6540	3941.67	LUCERO	616252.2680	1576474.2182
61	600657.7750	1576446.9260	4131.58	GERI	600487.3444	1575999.6249
62	614156.5210	1568701.1170	4227.09	SW 30	613982.2602	1568256.0137
63	575518.1130	1586543.7100	4038.20	BRYCE AZ MK	575354.8155	1586093.5441
64	576512.9440	1582067.6800	4357.70	BRYCE	576349.3642	1581618.7841
65	633185.2600	1566510.7280	4417.64	HORN	633005.6000	1566066.2462
66	580320.9040	1585783.2080	4128.59	NICK 2	580156.2437	1585333.2579
67	682452.1790	1628714.1810	3957.10	EC-30-2	682258.5400	1628252.0496
68	698323.2620	1606321.3780	3914.70	CHAS	698125.1198	1605865.6004
69	698212.0050	1609477.2870	3928.40	CHUCK	698013.8943	1609020.6139
70	682531.9020	1628747.5310	3965.57	EC-30	682338.2404	1628285.3902
71	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
100	684194.1900	1611160.8710	3912.56	USTC-518-NG	684000.0567	1610703.7202
101	684194.8810	1611165.7430	3912.33	USTC-518-NG	684000.7475	1610708.5908
102	684188.7970	1611168.5190	3912.27	USTC-518-NG	683994.6653	1610711.3660
103	684189.4230	1611176.5450	3912.53	USTC-518-NG	683995.2911	1610719.3898
104	684179.6480	1611178.5150	3912.57	USTC-518-NG	683985.5189	1610721.3592
105	684178.1630	1611171.1680	3912.37	USTC-518-NG	683984.0343	1610714.0143
106	684177.1790	1611163.0630	3913.00	USTC-518-NG	683983.0506	1610705.9116
107	684157.6940	1611173.6700	3912.42	USTC-518-STATION-5	683963.5711	1610716.5156
108	684176.2170	1611179.5100	3912.28	USTC-518-STATION-4	683982.0888	1610722.3539
109	684175.8730	1611172.3430	3912.51	USTC-518-STATION-2	683981.7449	1610715.1890
110	684173.8830	1611163.3430	3912.65	USTC-518-STATION-3	683979.7555	1610706.1915
111	684189.5770	1611170.0220	3912.30	USTC-518-STATION-1	683995.4450	1610712.8686
112	684160.3220	1611172.8640	3912.49	USTC-518-POTHOLE-1	683966.1984	1610715.7098
113	684125.1520	1611185.2360	3910.93	USTC-518-MW-1	683931.0383	1610728.0783
114	684130.9190	1611216.0540	3911.17	USTC-518-MW-2	683936.8037	1610758.8876
115	684158.8770	1611187.1610	3912.34	USTC-518-BLDGCORN-70	683964.7538	1610730.0028
116	684163.9700	1611180.4420	3912.46	USTC-518-BLDGCORN-70	683969.8453	1610723.2857
117	684211.6690	1611174.1790	3912.47	USTC-518-BLDGCORN-70	684017.5308	1610717.0244
118	684218.3800	1611179.3060	3912.45	USTC-518-BLDGCORN-70	684024.2399	1610722.1500
119	684236.0190	1611144.8000	3911.88	USTC-518-NAIL	684041.8739	1610687.6538
120	684242.7800	1611133.9130	3911.77	USTC-518-NAIL	684048.6330	1610676.7699
121	684203.7200	1611162.6570	3912.21	USTC-518-STATION-6	684009.5840	1610705.5057

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7924
PROFESSIONAL SURVEYOR

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-077

Appendix F
Laboratory Analytical Data and Data Validation Checklists

Note: The data validation checklists and laboratory analytical data reports are provided as separate files.

Appendix G
Waste Manifests

HAFB-001

Generator's Name	Generator's Address	Generator's Telephone No.
USAF	550 TABOSA AVE Holloman AFB NM 88330	575-491-8262

Origin of Special Waste (Project or Spill Location): ~~White Sands National Monument Park - Storage Lagoons~~ Holloman AFB NM Bldg # 55

Transporter #1 Company Name	Address	Telephone No.
Southwest Disposal	1350 LaVelle Road	575-434-1109
Transporter #2 Company Name	Address	Telephone No.
	Alamogordo, NM 88310	
Destination Facility Name/Site Address	Facility ID (Permit) Number	Telephone No.
Otero/Greentree Regional Landfill 24 Mls South of Alamogordo, Hwy 54	SWM-109102	575-439-4355

Type and Proper Name of Special Waste	Container(s) No.	Container(s) Type	Total Quantity	Unit Wt/Vol	
Non RCRA/Non Hazardous Substance ~~(Treatment Plant Lagoon Sludge)~~ (soil)		SD		6.95	Tons

Additional Descriptions for Special Waste Listed Above:

Site Contact: Todd Hiltunen 307-214-6080

Special Handling Instructions:

Southwest Disposal - Lined and Covered Roll-off

GENERATOR'S CERTIFICATION I hereby certify that the contents of this shipment are fully and accurately described above by type and proper name of the special waste, and that such waste has been managed, packaged, containerized and labeled in accordance with the requirements of 20.9.8 NMAC (Special Waste Requirements) in addition to any other applicable federal, state or local regulations.

Truck # 553 Bin #

Printed/Typed Name:	Signature:	Date:
Todd Hiltunen for Brent Hunt (CES)	for Brent Hunt (CES)	9/25/12

Transporter 1 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:
David Gurnbach		9/26/12

Transporter 2 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:

Discrepancy Indication Space:

Analytical supplied to landfill

no facility ID number

Facility Owner or Operator: ***I hereby acknowledge receipt of the special waste as indicated upon this manifest, except as noted above in the Discrepancy Indication Space.***

Printed/Typed Name:	Signature:	Date:
Darrell McGinnis / Attendant		9-26-12

~~Facility~~

OTERO/GREENTREE
REGIONAL LANDFILL

TRANSACTION: 28,080

CO. NAME:

ADDRESS: Environmental Waste Solutions
1348 B. Redtail Hawk Drive

CITY & STATE: Boardman, OH 44512

DATE: 9/26/12 TIME: 9:07 am

TRUCK NO.: 198

GROSS WEIGHT 47000

TARE WEIGHT: 33100

NET TONS: 13900 6.95

COST $: [redacted]

5% TAX $:

TOTAL DUE $:

WASTE: 5

WASTE DESC.: Construction Debris
H.A.F.B.

WASTE ORIGIN:

DRIVER

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-077

Appendix H
Risk Evaluation Calculations

Risk Additivity
Soil Analytical Data
Building 1251 (OT-C540) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC540-IS-0001-062012		OTC540-IS-0002-062012		OTC540-IS-0003-062012		OTC540-IS-0004-062012		OTC540-IS-0005-062012		OTC540-IS-0006-062012		OTC540-IS-0007-062112		OTC540-IS-0008-062112		OTC540-IS-0009-091712	
				Sample Date	6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/21/2012		6/21/2012		9/17/2012	
				Location	OT-C540-Station 1 influent line to tank		OT-C540-Station 1 influent line to tank		OT-C540-Station 2 septic tank		OT-C540-Station 2 septic tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 4 leach field		OT-C540-Station 4 leach field		OT-C540-Station 4C leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		14 - 16	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**80.4**		**83.9**		**95.4**		**93.9**		**83.9**		**86.7**		**87.7**		**85.6**		**87.7**	
VOLATILES (mg/kg)																						
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0012	U	0.0011	U	0.001	U	0.00095	U	0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U	0.0015	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0018	U	0.0018	U	0.0016	U	0.0015	U	0.002	U	0.0018	U	0.0016	U	0.0016	U	0.0021	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0012	U	0.0011	U	0.001	U	0.00095	U	0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0012	U	0.0011	U	0.001	U	0.00095	U	0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U
1,1-DICHLOROETHENE	NE	240	449		0.0015	U	0.0015	U	0.0013	U	0.0012	U	0.0017	U	0.0015	U	0.0014	U	0.0013	U	0.0017	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0013	UJ	0.0012	U	0.0011	U	0.001	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U	0.0015	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0024	U	0.0024	U	0.0021	U	0.002	U	0.0027	U	0.0025	U	0.0022	U	0.0022	U	0.0029	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.0011	U	0.001	U	0.00093	U	0.00086	U	0.0012	U	0.0011	U	0.00097	U	0.00094	U	0.0012	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0012	UJ	0.0011	U	0.001	U	0.00095	U	0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.0011	U	0.001	U	0.00093	U	0.00086	U	0.0012	U	0.0011	U	0.00097	U	0.00094	U	0.0012	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U	0.0015	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0013	UJ	0.0012	U	0.0011	U	0.001	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U	0.0015	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0012	UJ	0.0011	U	0.001	U	0.00095	U	0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U
2-HEXANONE	NE	210	NE		0.0057	U	0.0056	U	0.005	U	0.0047	U	0.0064	U	0.0058	U	0.0052	U	0.0051	U	0.0067	U
ACETONE	NE	61000	66600		0.021	U	0.021	U	0.019	U	0.13		0.024	U	0.0256	J	0.019	U	0.263		0.0553	J
BENZENE	NE	1.1	15.4		0.0016	U	0.0016	U	0.0014	U	0.0013	U	0.0018	U	0.0016	U	0.0015	U	0.0014	U	0.0019	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0012	U	0.0011	U	0.001	U	0.00095	U	0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U
BROMOFORM	NE	62	616		0.0016	U	0.0016	U	0.0014	U	0.0013	U	0.0018	U	0.0016	U	0.0015	U	0.0014	U	0.0019	U
BROMOMETHANE	NE	7.3	16.5		0.0021	U	0.0021	U	0.0019	U	0.0017	U	0.0024	U	0.0022	U	0.0019	U	0.0019	U	0.0025	U
CARBON DISULFIDE	NE	820	1530		0.0021	U	0.0021	U	0.0019	U	0.0017	U	0.0024	U	0.0022	U	0.0019	U	0.0019	U	0.0025	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0019	U	0.0019	U	0.0017	U	0.0016	U	0.0021	U	0.0019	U	0.0017	U	0.0017	U	0.0022	U
CHLOROBENZENE	NE	290	376		0.0011	UJ	0.001	U	0.00093	U	0.00086	U	0.0012	U	0.0011	U	0.00097	U	0.00094	U	0.0012	U
CHLOROETHANE	NE	15000	29800		0.0021	U	0.0021	U	0.0019	U	0.0017	U	0.0024	U	0.0022	U	0.0019	U	0.0019	U	0.0025	U
CHLOROFORM	NE	0.29	5.86		0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U	0.0015	U
CHLOROMETHANE	NE	120	275		0.0021	U	0.0021	U	0.0019	U	0.0017	U	0.0024	U	0.0022	U	0.0019	U	0.0019	U	0.0025	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0016	U	0.0016	U	0.0014	U	0.0013	U	0.0018	U	0.0016	U	0.0015	U	0.0014	U	0.0019	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0011	U	0.001	U	0.00093	U	0.00086	U	0.0012	U	0.0011	U	0.00097	U	0.00094	U	0.0012	U
CYCLOHEXANE	NE	7000	NE		0.0015	U	0.0015	U	0.0013	U	0.0012	U	0.0017	U	0.0015	U	0.0014	U	0.0013	U	0.0017	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.0011	U	0.001	U	0.00093	U	0.00086	U	0.0012	U	0.0011	U	0.00097	U	0.00094	U	0.0012	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0016	U	0.0016	U	0.0014	U	0.0013	U	0.0018	U	0.0016	U	0.0015	U	0.0014	U	0.0019	UJ
ETHYLBENZENE	NE	5.4	68.4		0.0011	UJ	0.001	U	0.00093	U	0.00086	U	0.0012	U	0.0011	U	0.00097	U	0.0047		0.0012	U
ISOPROPYLBENZENE	NE	2100	2430		0.0012	UJ	0.0011	U	0.001	U	0.00095	U	0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U
METHYL ACETATE	NE	78000	78200		0.013	U	0.013	U	0.012	U	0.011	U	0.015	U	0.013	U	0.012	U	0.012	U	0.0457	
METHYL ETHYL KETONE	NE	28000	37100		0.0064	U	0.0063	U	0.0057	U	0.0053	U	0.0072	U	0.0066	U	0.0059	R	0.0057	R	0.0076	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0058	U	0.0057	U	0.0051	U	0.0047	U	0.0065	U	0.0059	U	0.0053	U	0.0052	U	0.0068	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0014	UJ	0.0014	U	0.0012	U	0.0011	U	0.0015	U	0.0014	U	0.0013	U	0.0012	U	0.0016	U
METHYLENE CHLORIDE	NE	56	409		0.0048	U	0.0048	U	0.0043	U	0.004	U	0.0055	U	0.005	U	0.0045	U	0.0045	J	0.0057	U

Risk Additivity Evaluation at Building 1251, Holloman AFB

Analyte	C / N	0-10 ft bgs Max Hit (mg/kg)	Cancer Risk	NC ratio
1,1,1-TRICHLOROETHANE		ND		
1,1,2,2-TETRACHLOROETHANE		ND		
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND		
1,1,2-TRICHLOROETHANE		ND		
1,1-DICHLOROETHANE		ND		
1,1-DICHLOROETHENE		ND		
1,2,4-TRICHLOROBENZENE		ND		
1,2-DIBROMO-3-CHLOROPROPANE		ND		
1,2-DIBROMOETHANE		ND		
1,2-DICHLOROBENZENE		ND		
1,2-DICHLOROETHANE		ND		
1,2-DICHLOROPROPANE		ND		
1,3-DICHLOROBENZENE		ND		
1,4-DICHLOROBENZENE		ND		
2-HEXANONE		ND		
ACETONE		ND		
BENZENE		ND		
BROMODICHLOROMETHANE		ND		
BROMOFORM		ND		
BROMOMETHANE		ND		
CARBON DISULFIDE		ND		
CARBON TETRACHLORIDE		ND		
CHLOROBENZENE		ND		
CHLOROETHANE		ND		
CHLOROFORM		ND		
CHLOROMETHANE		ND		
CIS-1,2-DICHLOROETHYLENE		ND		
CIS-1,3-DICHLOROPROPENE		ND		
CYCLOHEXANE		ND		
DIBROMOCHLOROMETHANE		ND		
DICHLORODIFLUOROMETHANE		ND		
ETHYLBENZENE		ND		
ISOPROPYLBENZENE		ND		
METHYL ACETATE		ND		
METHYL ETHYL KETONE		ND		
METHYL ISOBUTYL KETONE		ND		
METHYLCYCLOHEXANE		ND		
METHYLENE CHLORIDE		ND		

Risk Additivity
Soil Analytical Data
Building 1251 (OT-C540) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC540-IS-0001-062012		OTC540-IS-0002-062012		OTC540-IS-0003-062012		OTC540-IS-0004-062012		OTC540-IS-0005-062012		OTC540-IS-0006-062012		OTC540-IS-0007-062112		OTC540-IS-0008-062112		OTC540-IS-0009-091712	
			Sample Date	6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/21/2012		6/21/2012		9/17/2012	
			Location	OT-C540-Station 1 influent line to tank		OT-C540-Station 1 influent line to tank		OT-C540-Station 2 septic tank		OT-C540-Station 2 septic tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 4 leach field		OT-C540-Station 4 leach field		OT-C540-Station 4C leach field	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		14 - 16	
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																					
STYRENE	NE	6300	7280	0.0027	UJ	0.0027	U	0.0024	U	0.0022	U	0.0031	U	0.0028	U	0.0025	U	0.0024	U	0.0032	U
TERT-BUTYL METHYL ETHER	NE	43	901	0.0021	U	0.0021	U	0.0019	U	0.0017	U	0.0024	U	0.0022	U	0.0019	U	0.0019	U	0.0025	U
TETRACHLOROETHYLENE	NE	22	7.02	0.0011	U	0.001	U	0.00093	U	0.00086	U	0.0012	U	0.0011	U	0.00097	U	0.00094	U	0.0012	U
TOLUENE	NE	5000	5270	0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U	0.0013	U	0.0012	U	0.0013	J	0.0015	U
TRANS-1,2-DICHLOROETHENE	NE	150	270	0.0016	U	0.0016	U	0.0014	U	0.0013	U	0.0018	U	0.0016	U	0.0015	U	0.0014	U	0.0019	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.0012	U	0.0011	U	0.001	U	0.00095	U	0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U
TRICHLOROETHYLENE	NE	0.91	8.77	0.0013	U	0.0012	U	0.0011	U	0.001	U	0.0014	U	0.0013	U	0.0012	U	0.0011	U	0.0015	U
TRICHLOROFLUOROMETHANE	NE	790	1410	0.0021	U	0.0021	U	0.0019	U	0.0017	U	0.0024	U	0.0022	U	0.0019	U	0.0019	U	0.0025	U
VINYL CHLORIDE	NE	0.06	0.728	0.0016	U	0.0016	U	0.0014	U	0.0013	U	0.0018	U	0.0016	U	0.0015	U	0.0014	U	0.0019	U
XYLENES, TOTAL	NE	630	814	0.0034	UJ	0.0033	U	0.003	U	0.0028	U	0.0038	U	0.0034	U	0.0031	U	0.0267		0.004	U
SEMIVOLATILES (mg/kg)																					
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	4.6	91.5	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
2,4-DICHLOROPHENOL	NE	180	183	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
2,4-DIMETHYLPHENOL	NE	1200	1220	0.026	U	0.025	U	0.022	U	0.022	U	0.025	U	0.024	U	0.024	U	0.024	U	0.024	U
2,4-DINITROPHENOL	NE	120	122	0.41	U	0.39	U	0.35	U	0.35	U	0.4	U	0.38	U	0.38	U	0.38	U	0.38	UJ
2,4-DINITROTOLUENE	NE	1.6	15.7	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
2,6-DINITROTOLUENE	NE	61	61.1	0.024	U	0.023	U	0.021	U	0.021	U	0.023	U	0.023	U	0.022	U	0.023	U	0.022	U
2-CHLORONAPHTHALENE	NE	6300	6260	0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
2-CHLOROPHENOL	NE	390	391	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
2-METHYLNAPHTHALENE	NE	230	NE	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
2-METHYLPHENOL	NE	3100	NE	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
2-NITROANILINE	NE	610	NE	0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
2-NITROPHENOL	NE	NE	NE	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
3-NITROANILINE	NE	NE	NE	0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	0.083	U	0.079	U	0.07	U	0.07	U	0.079	U	0.076	U	0.075	U	0.077	U	0.076	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
4-CHLOROANILINE	NE	2.4	NE	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	UJ	0.019	U	0.019	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
4-NITROANILINE	NE	24	NE	0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
4-NITROPHENOL	NE	NE	NE	0.17	U	0.16	U	0.14	U	0.14	U	0.16	U	0.15	U	0.15	U	0.15	UJ	0.15	U
ACENAPHTHENE	NE	3400	3440	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
ACENAPHTHYLENE	NE	NE	NE	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
ACETOPHENONE	NE	7800	7820	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
ANTHRACENE	NE	17000	17200	0.021	U	0.02	U	0.017	U	0.11	J	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
ATRAZINE	NE	2.1	NE	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U

Risk Additivity Evaluation at Building 1251, Holloman AFB

Analyte	C / N	0-10 ft bgs Max Hit (mg/kg)	Cancer Risk	NC ratio
VOLATILES - continued (mg/kg)				
STYRENE		ND		
TERT-BUTYL METHYL ETHER		ND		
TETRACHLOROETHYLENE		ND		
TOLUENE		ND		
TRANS-1,2-DICHLOROETHENE		ND		
TRANS-1,3-DICHLOROPROPENE		ND		
TRICHLOROETHYLENE		ND		
TRICHLOROFLUOROMETHANE		ND		
VINYL CHLORIDE		ND		
XYLENES, TOTAL		ND		
SEMIVOLATILES (mg/kg)				
2,2'-OXYBIS(1-CHLORO)PROPANE		ND		
2,4,5-TRICHLOROPHENOL		ND		
2,4,6-TRICHLOROPHENOL		ND		
2,4-DICHLOROPHENOL		ND		
2,4-DIMETHYLPHENOL		ND		
2,4-DINITROPHENOL		ND		
2,4-DINITROTOLUENE		ND		
2,6-DINITROTOLUENE		ND		
2-CHLORONAPHTHALENE		ND		
2-CHLOROPHENOL		ND		
2-METHYLNAPHTHALENE		ND		
2-METHYLPHENOL		ND		
2-NITROANILINE		ND		
2-NITROPHENOL		ND		
3,3'-DICHLOROBENZIDINE		ND		
3-NITROANILINE		ND		
4,6-DINITRO-2-METHYLPHENOL		ND		
4-BROMOPHENYL PHENYL ETHER		ND		
4-CHLORO-3-METHYLPHENOL		ND		
4-CHLOROANILINE		ND		
4-CHLOROPHENYL PHENYL ETHER		ND		
4-NITROANILINE		ND		
4-NITROPHENOL		ND		
ACENAPHTHENE		ND		
ACENAPHTHYLENE		ND		
ACETOPHENONE		ND		
ANTHRACENE		ND		
ATRAZINE		ND		

Risk Additivity
Soil Analytical Data
Building 1251 (OT-C540) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC540-IS-0001-062012		OTC540-IS-0002-062012		OTC540-IS-0003-062012		OTC540-IS-0004-062012		OTC540-IS-0005-062012		OTC540-IS-0006-062012		OTC540-IS-0007-062112		OTC540-IS-0008-062112		OTC540-IS-0009-091712	
				Sample Date	6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/21/2012		6/21/2012		9/17/2012	
				Location	OT-C540-Station 1 influent line to tank		OT-C540-Station 1 influent line to tank		OT-C540-Station 2 septic tank		OT-C540-Station 2 septic tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 4 leach field		OT-C540-Station 4 leach field		OT-C540-Station 4C leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		14 - 16	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																						
BENZALDEHYDE	NE	7800	NE	0.21	U	0.2	U	0.17	U	0.17	U	0.2	U	0.19	U	0.19	U	0.19	U	0.19	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.021	U	0.02	U	0.017	U	1.01		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZO(A)PYRENE	NE	0.015	0.148	0.021	U	0.02	U	0.017	U	1.03		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.021	U	0.02	U	0.017	U	1.15		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.021	U	0.02	U	0.017	U	0.663		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.021	U	0.02	U	0.017	U	0.394		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
BIPHENYL	NE	51	57.1	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.083	U	0.079	U	0.07	U	0.07	U	0.079	U	0.076	U	0.075	U	0.077	U	0.0907	J
CAPROLACTAM	NE	31000	NE	0.066	U	0.063	U	0.056	U	0.056	U	0.063	U	0.061	U	0.06	U	0.061	U	0.061	U
CARBAZOLE	NE	NE	NE	0.021	U	0.02	U	0.017	U	0.0307	J	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
CHRYSENE	NE	15	148	0.021	U	0.02	U	0.017	U	1.16		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.021	U	0.02	U	0.017	U	0.122	J	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
DIBENZOFURAN	NE	78	NE	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
DIETHYL PHTHALATE	NE	49000	48900	0.083	U	0.079	U	0.07	U	0.07	U	0.079	U	0.076	U	0.075	U	0.077	U	0.076	U
DIMETHYL PHTHALATE	NE	611000	611000	0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.083	U	0.079	U	0.07	U	0.07	U	0.079	U	0.076	U	0.075	U	0.077	U	0.076	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
FLUORANTHENE	NE	2300	2290	0.021	U	0.02	U	0.017	U	1.45		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
FLUORENE	NE	2300	2290	0.021	U	0.02	U	0.017	U	0.0244	J	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.091	U	0.087	U	0.077	U	0.077	U	0.087	U	0.084	U	0.083	U	0.085	U	0.084	UJ
HEXACHLOROETHANE	NE	12	42.8	0.041	U	0.039	U	0.035	U	0.035	U	0.04	U	0.038	U	0.038	U	0.038	U	0.038	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.021	U	0.02	U	0.017	U	0.605		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
ISOPHORONE	NE	510	5120	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	UJ	0.019	U
M,P-CRESOL	NE	NE	NE	0.03	U	0.028	U	0.025	U	0.025	U	0.029	U	0.027	U	0.027	U	0.028	U	0.027	U
NAPHTHALENE	NE	3.6	43.0	0.033	U	0.031	U	0.028	U	0.028	U	0.032	U	0.031	U	0.03	U	0.031	U	0.03	U
NITROBENZENE	NE	4.8	53.5	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.25	U	0.24	U	0.21	U	0.21	U	0.24	U	0.23	U	0.23	U	0.23	U	0.23	U
PHENANTHRENE	NE	1830	1830	0.021	U	0.02	U	0.017	U	0.511		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
PHENOL	NE	18000	18300	0.021	U	0.02	U	0.017	U	0.017	U	0.02	U	0.019	U	0.019	U	0.019	U	0.019	U
PYRENE	NE	1700	1720	0.021	U	0.02	U	0.017	U	1.62		0.02	U	0.019	U	0.019	U	0.019	U	0.019	U

Risk Additivity Evaluation at Building 1251, Holloman AFB

Analyte	C / N	0-10 ft bgs Max Hit (mg/kg)	Cancer Risk	NC ratio
SEMIVOLATILES - continued (mg/kg)				
BENZALDEHYDE		ND		
BENZO(A)ANTHRACENE		ND		
BENZO(A)PYRENE		ND		
BENZO(B)FLUORANTHENE		ND		
BENZO(G,H,I)PERYLENE		ND		
BENZO(K)FLUORANTHENE		ND		
BENZYL BUTYL PHTHALATE		ND		
BIPHENYL		ND		
BIS(2-CHLOROETHOXY) METHANE		ND		
BIS(2-CHLOROETHYL) ETHER		ND		
BIS(2-ETHYLHEXYL) PHTHALATE		ND		
CAPROLACTAM		ND		
CARBAZOLE		ND		
CHRYSENE		ND		
DIBENZ(A,H)ANTHRACENE		ND		
DIBENZOFURAN		ND		
DIETHYL PHTHALATE		ND		
DIMETHYL PHTHALATE		ND		
DI-N-BUTYL PHTHALATE		ND		
DI-N-OCTYLPHTHALATE		ND		
FLUORANTHENE		ND		
FLUORENE		ND		
HEXACHLOROBENZENE		ND		
HEXACHLOROBUTADIENE		ND		
HEXACHLOROCYCLOPENTADIENE		ND		
HEXACHLOROETHANE		ND		
INDENO(1,2,3-C,D)PYRENE		ND		
ISOPHORONE		ND		
M,P-CRESOL		ND		
NAPHTHALENE		ND		
NITROBENZENE		ND		
N-NITROSODI-N-PROPYLAMINE		ND		
N-NITROSODIPHENYLAMINE		ND		
PENTACHLOROPHENOL		ND		
PHENANTHRENE		ND		
PHENOL		ND		
PYRENE		ND		

Risk Additivity
Soil Analytical Data
Building 1251 (OT-C540) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC540-IS-0001-062012		OTC540-IS-0002-062012		OTC540-IS-0003-062012		OTC540-IS-0004-062012		OTC540-IS-0005-062012		OTC540-IS-0006-062012		OTC540-IS-0007-062112		OTC540-IS-0008-062112		OTC540-IS-0009-091712	
				Sample Date	6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/21/2012		6/21/2012		9/17/2012	
				Location	OT-C540-Station 1 influent line to tank		OT-C540-Station 1 influent line to tank		OT-C540-Station 2 septic tank		OT-C540-Station 2 septic tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 4 leach field		OT-C540-Station 4 leach field		OT-C540-Station 4C leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		14 - 16	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																						
1,3,5-TRINITROBENZENE	NE	2200.0	NE		0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
1,3-DINITROBENZENE	NE	6.10	NE		0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1		0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
2,4-DINITROTOLUENE	NE	1.60	15.7		0.089	U	0.076	U	0.075	U	0.085	U	0.094	U	0.084	U	0.077	U	0.083	U	0.08	U
2,6-DINITROTOLUENE	NE	61.0	61.1		0.079	U	0.068	U	0.068	U	0.076	U	0.084	U	0.075	U	0.069	U	0.074	U	0.071	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE		0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
2-NITROTOLUENE	NE	2.90	29.1		0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
3-NITROTOLUENE	NE	6.10	7.82		0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE		0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
4-NITROTOLUENE	NE	30.0	244.4		0.092	U	0.079	U	0.079	U	0.089	U	0.098	U	0.087	U	0.08	U	0.086	U	0.083	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2		0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
NITROBENZENE	NE	4.80	53.5		0.085	U	0.073	U	0.072	U	0.082	U	0.09	U	0.08	U	0.074	U	0.079	U	0.076	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7		0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
TETRYL	NE	240.0	244.0		0.073	U	0.063	U	0.062	U	0.07	U	0.077	U	0.069	U	0.063	U	0.068	U	0.066	U
PCBS (mg/kg)																						
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93		0.0083	UJ	0.0083	UJ	0.0069	U	0.0071	U	0.0078	U	0.0076	U	0.0076	U	0.0077	U	0.0076	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49		0.01	U	0.01	U	0.0086	U	0.0088	U	0.0098	U	0.0095	U	0.0095	U	0.0096	U	0.0095	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49		0.01	U	0.01	U	0.0086	U	0.0088	U	0.0098	U	0.0095	U	0.0095	U	0.0096	U	0.0095	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22		0.0083	U	0.0083	U	0.0069	U	0.0071	U	0.0078	U	0.0076	U	0.0076	U	0.0077	U	0.0076	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22		0.0083	U	0.0083	U	0.0069	U	0.0071	U	0.0078	U	0.0076	U	0.0076	U	0.0077	U	0.0076	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12		0.0083	U	0.0083	U	0.0069	U	0.0071	U	0.0078	U	0.0076	U	0.0076	U	0.0077	U	0.0076	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22		0.0083	U	0.0083	U	0.0069	U	0.0071	U	0.0078	U	0.0076	U	0.0076	U	0.0077	U	0.0076	U
METALS (mg/kg)																						
ALUMINUM	13722	77000	78000		5800		3140		4390		4460		3400		3400		4160		4380		4080	J
ANTIMONY	1.6	31	31.3		1	U	1.1	U	0.89	U	0.95	U	1	U	1	U	1	U	1.2	U	0.81	J
ARSENIC	3.7	0.39	3.90		2	J	1.1	U	1.3	J	0.95	U	1	U	1	U	1.5	J	1.2	J	0.75	U
BARIUM	169.3	15000	15600		68.4	J	29.8	J	44.8	J	53.1	J	50.4	J	50.4	J	139		45.9	J	25.3	J
BERYLLIUM	1.6	160	156		0.51	U	0.54	U	0.44	U	0.48	U	0.51	U	0.51	U	0.52	U	0.58	U	0.38	U
CADMIUM	0.3	70	70.3		0.51	U	0.54	U	0.44	U	0.48	U	0.51	U	0.51	U	0.52	U	0.58	U	0.38	UJ
CALCIUM	317332	NE	NE		212000		231000		177000		173000		255000		255000		165000		237000		197000	
CHROMIUM[d]	25	117000	117000		5	J	2.9	J	6.3		5.4		2.6	J	2.6	J	2.9	J	3.8	J	4.4	J
COBALT	7.7	23	NE		2.3	J	1.2	J	2.6	J	2.3	J	1.5	J	1.5	J	1.3	J	2.9	J	1.1	J
COPPER	13	3100	3130		3.1	J	1.7	J	4.5	J	4.9	J	2.7	J	2.7	J	1.8	J	3.8	J	1.8	J
IRON	23049	55000	54800		5060		2720		5720		5280		2640		2640		2900		3980		3020	J
LEAD	10.9	400	400		3.4	J	1.6	J	3.7	J	3.9	J	1.2	J	1.2	J	1.7	J	2.5	J	1.7	J
MAGNESIUM	16991	NE	NE		4230		2050	J	6750		3820		3160		3160		2100	J	2780	J	1980	J
MANGANESE	393	1800	1860		99.1		76.1		329		125		47.5		47.5		38.8		571		36	J
MERCURY	0.0108	10	15.6		0.01	U	0.0089	U	0.0083	U	0.0087	U	0.0093	U	0.0093	U	0.0092	U	0.009	U	0.0089	U
NICKEL	17.4	1500	1560		4.6	J	2.5	J	6	J	4.9	J	3.1	J	1.2	J	2.9	J	7.9	J	2.7	J
POTASSIUM	5077	NE	NE		1660	J	909	J	832	J	936	J	1130	J	514	J	1010	J	1190	J	1060	J

Risk Additivity Evaluation at Building 1251, Holloman AFB

Analyte	C / N	0-10 ft bgs Max Hit (mg/kg)	Cancer Risk	NC ratio	
EXPLOSIVES (mg/kg)					
1,3,5-TRINITROBENZENE		ND			
1,3-DINITROBENZENE		ND			
2,4,6-TRINITROTOLUENE		ND			
2,4-DINITROTOLUENE		ND			
2,6-DINITROTOLUENE		ND			
2-AMINO-4,6-DINITROTOLUENE		ND			
2-NITROTOLUENE		ND			
3-NITROTOLUENE		ND			
4-AMINO-2,6-DINITROTOLUENE		ND			
4-NITROTOLUENE		ND			
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE		ND			
NITROBENZENE		ND			
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE		ND			
TETRYL		ND			
PCBS (mg/kg)					
PCB-1016 (AROCLOR 1016)		ND			
PCB-1221 (AROCLOR 1221)		ND			
PCB-1232 (AROCLOR 1232)		ND			
PCB-1242 (AROCLOR 1242)		ND			
PCB-1248 (AROCLOR 1248)		ND			
PCB-1254 (AROCLOR 1254)		ND			
PCB-1260 (AROCLOR 1260)		ND			
METALS (mg/kg)					
ALUMINUM	N	5800		0.074	
ANTIMONY		ND			
ARSENIC	C	2	5.13E-06		
BARIUM	N	139		0.0089	
BERYLLIUM		ND			
CADMIUM		ND			
CALCIUM	NUTRIENT	255000			
CHROMIUMd	N	6.3		0.000054	
COBALT	N	2.6		0.113	RSL
COPPER	N	4.5		0.0014	
IRON	N	5720		0.10	
LEAD	N	3.7		0.0093	
MAGNESIUM	NUTRIENT	6750			
MANGANESE	N	329		0.18	
MERCURY		ND			
NICKEL	N	6		0.0038	
POTASSIUM	NUTRIENT	1660			

Risk Additivity
Soil Analytical Data
Building 1251 (OT-C540) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC540-IS-0001-062012		OTC540-IS-0002-062012		OTC540-IS-0003-062012		OTC540-IS-0004-062012		OTC540-IS-0005-062012		OTC540-IS-0006-062012		OTC540-IS-0007-062112		OTC540-IS-0008-062112		OTC540-IS-0009-091712	
				Sample Date		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/20/2012		6/21/2012		6/21/2012		9/17/2012	
				Location		OT-C540-Station 1 influent line to tank		OT-C540-Station 1 influent line to tank		OT-C540-Station 2 septic tank		OT-C540-Station 2 septic tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 4 leach field		OT-C540-Station 4 leach field		OT-C540-Station 4C leach field	
				Depth (ft bgs)		3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		14 - 16	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
METALS (mg/kg)																							
SELENIUM	1.4	390	391	2	U	2.2	U	1.8	U	1.9	U	2	U	2.1	U	2.1	U	2.3	U	1.5	U		
SILVER	1.1	390	391	0.51	U	0.54	U	0.44	U	0.48	U	0.51	U	0.53	U	0.52	U	0.58	U	0.38	U		
SODIUM	5196	NE	NE	560	U	600	U	490	U	520	U	605	J	590	U	1900	J	1560	J	1070	J		
THALLIUM	1.3	0.78	0.782	1.3	U	1.4	U	1.2	U	1.2	U	1.3	U	1.4	U	1.4	U	1.5	U	0.98	UJ		
VANADIUM	42.6	390	391	15.2	J	5.9	J	11.8	J	10.2	J	7.4	J	3.2	J	8.3	J	9.2	J	4.8	J		
ZINC	54.6	23000	23500	14		7.7	J	28.3		59.1		7.7	J	5.3	J	8.2	J	10.4	J	10	J		
PETROLEUM HYDROCARBONS (mg/kg)																							
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	3.8	U	3.3	U	2.6	U	2.2	U	3.4	U	3.6	U	2.7	U	3.5	U	4.2	U		
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	4.1	U	3.9	U	3.5	U	3.5	U	3.9	U	3.8	U	3.8	U	3.9	U	3.8	U		
OIL RANGE ORGANICS C28-C40	NE	NE	1000	4.1	U	4.45	J	3.5	U	3.5	U	3.9	U	3.8	U	3.8	U	3.9	U	3.8	U		
CYANIDE (mg/kg)																							
CYANIDE	NE	22.0	46.9	0.073	U	0.07	U	0.062	U	0.064	U	0.072	U	0.068	U	0.066	U	0.07	U	0.066	U		
TRITIUM (pCi/g)																							
TRITIUM	NE	NE	NE	3.98	U	3.78	U	4.12	U	3.94	U	4.04	U	4.09	U	4.23	U	4.06	U	3.84	U		

Risk Additivity Evaluation at Building 1251, Holloman AFB

Analyte	C / N	0-10 ft bgs Max Hit (mg/kg)	Cancer Risk	NC ratio
METALS (mg/kg)				
SELENIUM		ND		
SILVER		ND		
SODIUM	NUTRIENT	1900		
THALLIUM		ND		
VANADIUM	N	15.2		0.039
ZINC	N	28.3		0.0012
PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10		ND		
DIESEL RANGE ORGANICS C10-C28		ND		
OIL RANGE ORGANICS C28-C40		ND		
CYANIDE (mg/kg)				
CYANIDE		ND		
TRITIUM (pCi/g)				
TRITIUM		ND		
	SUM:		**5.13E-06**	**0.53**

Risk Additivity
Soil Analytical Data
Building 1251 (OT-C540) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

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Appendix I
Ecological Evaluation

NEW MEXICO ENVIRONMENT DEPARTMENT
SITE ASSESSMENT CHECKLIST
(From NMED (2012) Attachment A)

I. SITE LOCATION

1. Site Name: Building 1251 (OT-C540) Inactive Septic System
   US EPA I.D. Number: NM6572124422
   Location: Tularosa Basin within Holloman Air Force Base (HAFB)
   County: Otero
   City: HAFB _____ State: NM

2. Latitude: 32º 55´ 26.772˝ N Longitude: 106º 4´ 22.653˝ W

3. Attach site maps, including a topographical map, a diagram which illustrates the layout of the facility (e.g., site boundaries, structures, etc.), and maps showing all habitat areas identified in Section III of the checklist. Also, include maps which illustrate known release areas, sampling locations, and any other important features, if available.

Note: Site maps and supporting information that include (1) a Physiographic Map, (2) a Site Layout and Sampling Location Map, and (3) a Site Photo Log are generally included for all sites in the RFI reports. A site habitat map and a Google Earth photo that shows the site habitat are attached to this Site Assessment Checklist.

II. SITE CHARACTERIZATION

1. Indicate the approximate area of the site (i.e., acres or sq. ft):

   The Building 1251 site is approximately 1 acre in size.

2. Provide an approximate breakdown of the land uses on the site:

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	_____% Undisturbed	100% Other[c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, etc.):

_____

[b]For agricultural areas, please list the crops and/or livestock which are present:

_____

[c]For areas designated as "other", please describe the usage of the area:
Building 1251 was constructed in 1965 and is listed in Holloman AFB records as a Research and Testing Shop. The building has been vacant since the mid-1990s. The Septic Tanks

Report (see Appendix A of the RFI Report) indicates that the building contained a toilet and lavatory. The septic tank was abandoned in place in January 2008 by opening the tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill (North Wind, Inc., 2008). Recent photographs show that since the site is not currently being used, vegetation is gradually returning to the site.

3. Provide an approximate breakdown of the land uses in the area surrounding the site. Indicate the radius (in miles) of the area described: approximately 0.5 mile

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	80 % Undisturbed	20 % Other [c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, golf course, etc.):

_____

[b]For agricultural areas, please list the crops and/or livestock which are present:

_____

[c]For areas designated as "other", please describe the usage of the area:
Habitat Map for Holloman AFB (attached) shows that habitat within 0.5 mile radius is a mix fourwing saltbush shrubland with honey mesquite, gypsum dropseed grassland, fourwing saltbush/gypsum dropseed shrubland, and fourwing saltbush/alkali sacaton shrubland habitats. There are also some areas to the east of the site that are shown as Development/Ground Disturbance.

4. Describe reasonable and likely future land and/or water use(s) at the site.
Land use is likely to remain the same.

5. Describe the historical uses of the site. Include information on chemical releases that may have occurred as a result of previous land uses. For each chemical release, provide information on the form of the chemical released (i.e., solid, liquid, vapor) and the known or suspected causes or mechanism of the release (i.e., spills, leaks, material disposal, dumping, explosion, etc.).

_____

Building 1251 was constructed in 1965 and is listed in Holloman AFB records as a Research and Testing Shop. The building has been vacant since the mid-1990s. Site use is likely to remain the same.

6. If any movement of soil has taken place at the site, describe the degree of the disturbance. Indicate the likely source of any disturbances (e.g., erosion, agricultural, mining, industrial activities, removals, etc.) and estimate when these events occurred.

_____

Site disturbances of soil have been limited to excavation activities associated with building construction and septic system installation and septic system closure activities.

7. Describe the current uses of the site. Include information on recent (previous 5 years) disturbances or chemical releases that have occurred. For each chemical release, provide information on the form of the chemical released and the causes or mechanism of the release.

Building 1251 is currently unused. The septic tank was abandoned in place in January 2008 by opening the tank, pumping out the contents, crushing the tank bottom, and backfilling the tank with clean fill (North Wind, Inc., 2008).

8. Identify the location or suspected location of chemical releases at the site. Provide an estimate of the distance between these locations and the areas identified in Section III.

Chemical releases that may have occurred are associated with septic system leakage.

9. Identify the suspected contaminants of concern (COCs) at the site. If known, include the maximum contaminant levels. Please indicate the source of data cited (e.g., RFI, confirmatory sampling, etc.).

As documented in the RFI, detected constituents from soil samples collected include several metals. Additionally, samples were analyzed for VOCs, SVOCs, explosives, PCBs, petroleum hydrocarbons (gasoline, diesel, and oil range organics), cyanide, and tritium; however all were non-detect in soil samples from the site (for 0 to 10 feet bgs, the zone of interest for ecological receptors).

10. Identify the media (e.g., soil (surface or subsurface), surface water, air, groundwater) which are known or suspected to contain COCs.
Surface and subsurface soil, and potentially, groundwater

11. Indicate the approximate depth to groundwater (in feet below ground surface [(bgs)].

A water-bearing zone was not encountered during soil boring advancement. Therefore, a groundwater investigation was not conducted at Building 1251.

12. Indicate the direction of groundwater flow (e.g., north, southeast, etc.)

According to Figure 2-3 of the RFI report, the direction of groundwater flow at Holloman AFB has been shown to be generally from northeast to southwest. Groundwater was not encountered at Building 1251 during soil boring advancement.

III. HABITAT EVALUATION

III.A Wetland Habitats

Are any wetland[1] areas such as marshes or swamps on or adjacent to the site?

☐ Yes X No

If yes, indicate the wetland area on the attached site map and answer the following questions regarding the wetland area. If more than one wetland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wetland area. Distinguish between wetland areas by using names or other designations (such as location), and clearly identify each area on the site map. Also, obtain and attach a National Wetlands Inventory Map (or maps) to illustrate each wetland area.

Identify the sources of the observations and information (e.g., National Wetland Inventory, Federal or State Agency, USGS topographic maps) used to make the determination that wetland areas are or are not present.

The Integrated Natural Resource Management Plan for Holloman AFB (HAFB, 2011) and site observations.

If no wetland areas are present, proceed to Section III.B.

1Wetlands are defined in 40 CFR §232.2 as " Areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Examples of typical wetlands plants include: cattails, cordgrass, willows and cypress trees. National wetland inventory maps may be available at http:\\nwi.fws.gov. Additional information on wetland delineation criteria is also available from the Army Corps of Engineers.

Wetland Area Questions

☐ Onsite ☐ Offsite

Name or
Designation:_____

1. Indicate the approximate area of the wetland (acres or ft^2)_____

2. Identify the type(s) of vegetation present in the wetland.

   - ❑ Submergent (i.e., underwater) vegetation
   - ❑ Emergent (i.e., rooted in the water, but rising above it) vegetation
   - ❑ Floating vegetation
   - ❑ Scrub/shrub
   - ❑ Wooded
   - ❑ Other (Please describe):_____

3. Estimate the vegetation density of the wetland area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Is standing water present? ☐ Yes ☐ No

   If yes, is the water primarily: ☐ Fresh or ☐ Brackish
   Indicate the approximate area of the standing water (ft^2): _____
   Indicate the approximate depth of the standing water, if known (ft. or in.)_____

5. If known, indicate the source of the water in the wetland.

   - ❑ Stream/River/Creek/Lake/Pond
   - ❑ Flooding
   - ❑ Groundwater
   - ❑ Surface runoff

6. Is there a discharge from the facility to the wetland? ☐ Yes ☐ No

   If yes, please
   describe:_____
   _____
   _____
   _____
   _____

Wetland Area Questions (Continued)

7. Is there a discharge from the wetland? ☐ Yes ☐ No
   If yes, indicate the type of aquatic feature the wetland discharges into:

   - ❑ Surface stream/River (Name:_____)
   - ❑ Lake/Pond (Name:_____)
   - ❑ Groundwater
   - ❑ Not sure

8. Does the area show evidence of flooding? ☐ Yes ☐ No
   If yes, indicate which of the following are present (mark all that apply):

   - ❑ Standing water
   - ❑ Water-saturated soils
   - ❑ Water marks
   - ❑ Buttressing
   - ❑ Debris lines
   - ❑ Mud cracks
   - ❑ Other (Please describe):_____

9. Animals observed in the wetland area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:
   _____
   _____
   _____
   _____

III.B Aquatic Habitats

III.B.1 Non-Flowing Aquatic Features

Are any non-flowing aquatic features (such as ponds or lakes) located at or adjacent to the site?

☐ Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the non-flowing aquatic features. If more than one non-flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.B.2.

Non-Flowing Aquatic Feature Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Indicate the type of aquatic feature present:

   - ❑ Natural (e.g., pond or lake)
   - ❑ Man-made (e.g., impoundment, lagoon, canal, etc.)

2. Estimate the approximate size of the water body (in acres or sq. ft.)_____

3. If known, indicate the depth of the water body (in ft. or in.)._____

Non-Flowing Aquatic Feature Questions (Continued)

4. Indicate the general composition of the bottom substrate. Mark all sources that apply from the following list.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

☐ Other (please specify):_____

5. Indicate the source(s) of the water in the aquatic feature. Mark all sources that apply from the following list.

- ❑ River/Stream/Creek
- ❑ Groundwater
- ❑ Industrial Discharge
- ❑ Surface Runoff
- ❑ Other (please specify):_____

6. Is there a discharge from the facility to the aquatic feature? ☐ Yes ☐ No
   If yes, describe the origin of each discharge and its migration path:
   _____
   _____
   _____
   _____

7. Does the aquatic feature discharge to the surrounding environment? ☐ Yes ☐ No
   If yes, indicate the features from the following list into which the aquatic feature discharges, and indicate whether the discharge occurs onsite or offsite:

- ❑ River/Stream/Creek ☐ onsite ☐ offsite
- ❑ Groundwater ☐ onsite ☐ offsite
- ❑ Wetland ☐ onsite ☐ offsite
- ❑ Impoundment ☐ onsite ☐ offsite
- ❑ Other (please describe)_____

Non-Flowing Aquatic Feature Questions (Continued)

8. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Fish
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, turtles)
- ❑ Amphibians (e.g., frogs, salamanders)
- ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

Specify species, if known:

_____
_____
_____
_____

III.B.2 Flowing Aquatic Features

Are any flowing aquatic features (such as streams or rivers) located at or adjacent to the site?

☐ Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the flowing aquatic features. If more than one flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map

If no, proceed to Section III.C.

Flowing Aquatic Feature Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Indicate the type of flowing aquatic feature present.

   - ❑ River
   - ❑ Stream
   - ❑ Creek
   - ❑ Brook
   - ❑ Dry wash
   - ❑ Arroyo
   - ❑ Intermittent stream
   - ❑ Artificially created (ditch, etc.)
   - ❑ Other (specify)
   - ❑

2. Indicate the general composition of the bottom substrate.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

   ☐ Other (please specify):_____

3. Describe the condition of the bank (e.g., height, slope, extent of vegetative cover) of the aquatic feature.

   _____
   _____
   _____
   _____

4. Is there a discharge from the facility to the aquatic feature? ☐ Yes ☐ No
   If yes, describe the origin of each discharge and its migration path:

   _____
   _____
   _____
   _____

5. Indicate the discharge point of the water body. Specify name, if known.

   _____
   _____
   _____

Flowing Aquatic Feature Questions (Continued)

6. If the flowing aquatic feature is a dry wash or arroyo, answer the following questions.
   - ❑ Check here if feature is not a dry wash or arroyo

   If known, specify the average number of days in a year in which flowing water is present in the feature: _____

   Is standing water or mud present? Check all that apply.
   - ❑ Standing water
   - ❑ Mud
   - ❑ Neither standing water or mud

   Does the area show evidence of recent flow (e.g., flood debris clinging to vegetation)?
   - ❑ Yes
   - ❑ No
   - ❑ Not sure
7. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:

   _____
   _____
   _____
   _____

III.C Terrestrial Habitats

III.C.1 Wooded

Are any wooded areas on or adjacent to the site? ☐ Yes X No

If yes, indicate the wooded area on the attached site map and answer the following questions. If more than one wooded area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wooded area. Distinguish between wooded areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.2.

Wooded Area Questions

☐ On-site ☐ Off-site

Name or Designation:_____

1. Estimate the approximate size of the wooded area (in acres or sq. ft.)

2. Indicate the dominant type of vegetation in the wooded area.

   - ❑ Evergreen
   - ❑ Deciduous
   - ❑ Mixed

Dominant plant species, if known:_____

3. Estimate the vegetation density of the wooded area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the predominant size of the trees at the site. Use diameter at chest height.

   - ❑ 0-6 inches
   - ❑ 6-12 inches
   - ❑ >12 inches
   - ❑ No single size range is predominant

5. Animals observed in the wooded area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:_____

III.C.2 Shrub/Scrub

Are any shrub/scrub areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the shrub/scrub area on the attached site map and answer the following questions. If more than one shrub/scrub area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual shrub/scrub area. Distinguish between shrub/scrub areas, using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.3.

Shrub/Scrub Area Questions

X Onsite X Offsite

Name or Designation: Chihuahuan Desert Scrub (HAFB, 2011).

Note also: On-site areas are almost entirely gravel covered and void of habitat or vegetation with some apparent pockets of desert vegetation. Surrounding site habitat is characterized as Chihuahuan Desert. The habitat map (attached) shows that habitat surrounding the site is dominated by fourwing saltbush/alkali sacaton shrubland habitat, with lesser amounts of fourwing saltbush shrubland with honey mesquite, and fourwing saltbush gypsum dropseed shrubland.

1. Estimate the approximate size of the shrub/scrub area (in acres or sq. ft.). Surrounding HAFB are tens of thousands of acres of Chihuahuan Desert Scrub.

2. Indicate the dominant type of shrub/scrub vegetation present, if known.

According to information provided in Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011), the area around Building 1251 (OT-C540) is a mix of fourwing saltbush shrubland with honey mesquite, gypsum dropseed grassland, fourwing saltbush/gypsum dropseed shrubland, and fourwing saltbush/alkali sacaton shrubland habitats.

3. Estimate the vegetation density of the shrub/scrub area.

- ❑ Dense (i.e., greater than 75% vegetation)
- X Moderate (i.e., 25% to 75% vegetation)
- ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the scrub/shrub vegetation.

- ❑ 0-2 feet
- X 2-5 feet
- ❑ >5 feet

5. Animals observed in the shrub/scrub area or suspected to be present based on indirect evidence or file material:
   - X Birds
   - X Mammals
   - X Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:
   The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna

associated with the shrubland habitat potentially present in the area of Building 1251. Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam kangaroo rat *(Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.3 Grassland

Are any grassland areas on or adjacent to the site? ☐ Yes X No

If yes, indicate the grassland area on the attached site map and answer the following questions. If more than one grassland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual grassland area. Distinguish between grassland areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.4.

Grassland Area Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Estimate the approximate size of the grassland area (in acres or sq. ft.)._____

2. Indicate the dominant plant type, if known.
_____
_____
_____
_____

3. Estimate the vegetation density of the grassland area.

- ❑ Dense (i.e., greater than 75% vegetation)
- ❑ Moderate (i.e., 25% to 75% vegetation)
- ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the dominant plant type (in ft. or in.)_

5. Animals observed in the grassland area or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, lizards)
- ❑ Amphibians (e.g., toads, salamanders)

Specify species, if known:

III.C.4 Desert

Are any desert areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the desert area on the attached site map and answer the following questions. If more than one desert area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual desert area. Distinguish between desert areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.5.

Desert Area Questions

X Onsite X Offsite
Name or Designation: Chihuahuan Desert

1. Estimate the approximate size of the desert area (in acres or sq. ft.).
This site including HAFB is contained within tens of thousands of acres of the Chihuahuan Desert.

2. Describe the desert area (e.g., presence or absence of vegetation, vegetation types, presence/size of rocks, sand, etc.)
Many volumes of literature have been written on the natural biota of the Chihuahuan Desert. Detailed descriptions about the biotic communities within HAFB can be found in the HAFB Integrated Natural Resource Management Plan, (HAFB, 2011). Habitats directly associated with this Site include typical desert scrub communities.

3. Animals observed in the desert area or suspected to be present based on indirect evidence or file material:

X Birds
X Mammals
X Reptiles (e.g., snakes, lizards)
☐ Amphibians (e.g., toads, salamanders)

Specify species, if known:

The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna associated with the shrubland habitat potentially present in the area of Building 1251. Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam

kangaroo rat (*Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.5 Other

1. Are there any other terrestrial communities or habitats on or adjacent to the site which were not previously described?

☐ Yes X No

If yes, indicate the "other" area(s) on the attached site map and describe the area(s) below. Distinguish between onsite and offsite areas. If no, proceed to Section III.D.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

III.D Sensitive Environments and Receptors

1. Do any other potentially sensitive environmental areas[2] exist adjacent to or within 0.5 miles of the site? If yes, list these areas and provide the source(s) of information used to identify sensitive areas. *Do not answer "no" without confirmation from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

The following is taken from the Integrated Natural Resources Management Plan for HAFB (HAFB,2011). HAFB and its Geographically Separated Units (GSUs) have high biodiversity, including many sensitive species. No threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The White Sands pupfish is not Federally-listed nor has critical habitat been designated because of the multi-agency cooperative agreement to manage the species to support viable populations through habitat management and research. Building 1251 is near Malone and Ritas Draws, but is not within 0.5 miles of the pupfish habitat zones.

Most of the sensitive species are birds that are either associated with grassland habitats on main base or with wetland habitats, primarily in the Lake Holloman Public Access Area wetlands complex south of the Cantonment. Sensitive grassland and desert species at HAFB that are discussed in further detail in the management plan include:

2 Areas that provide unique and often protected habitat for wildlife species. These areas are typically used during critical life stages such as breeding, hatching, rearing of young and overwintering. Refer to **Table 1** at the end of this document for examples of sensitive environments.

- White Sands pupfish
- Acarospora clauzadeana lichen
- Grassland neotropical migratory birds
- Western burrowing owl
- Aplomado falcon
- Grassland raptors
- Bats
- Texas horned lizard and other reptiles

2. Are any areas on or near (i.e., within 0.5 miles) the site which are owned or used by local tribes? If yes, describe. *Contact the Tribal Liason in the Office of the Secretary (505)827-2855 to obtain this information.*

No

3. Does the site serve or potentially serve as a habitat, foraging area, or refuge by rare, threatened, endangered, candidate and/or proposed species (plants or animals), or any otherwise protected species? If yes, identify species. *This information should be obtained from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

No, based on information in the Integrated Natural Resources Management Plan, no threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The plan establishes protocols for management of sensitive desert and grassland habitats.

4. Is the site potentially used as a breeding, roosting or feeding area by migratory bird species? If yes, identify which species.

Likely not. The site has very limited viable habitat due to the disturbed nature of the site, but areas surrounding the site could potentially provide habitat for these purposes.

5. Is the site used by any ecologically[3], recreationally, or commercially important species? If yes, explain.

No

3 Ecologically important species include populations of species which provide a critical (i.e., not replaceable) food resource for higher organisms and whose function as such would not be replaced by more tolerant species; or perform a critical ecological function (such as organic matter decomposition) and whose functions will not be replaced by other species. Ecologically important species include pest and opportunistic species that populate an area if they serve as a food source for other species, but do not include domesticated animals (e.g., pets and livestock) or plants/animals whose existence is maintained by continuous human interventions (e.g., fish hatcheries, agricultural crops, etc.,)

IV. EXPOSURE PATHWAY EVALUATION

1. Do existing data provide sufficient information on the nature, rate, and extent of contamination at the site?

   X Yes
   ❑ No
   ❑ Uncertain

   Please provide an explanation for your answer: Sample results have sufficiently characterized the site.

2. Do existing data provide sufficient information on the nature, rate, and extent of contamination in offsite affected areas?

   □ Yes
   ❑ No
   ❑ Uncertain
   X No offsite contamination

   Please provide an explanation for your answer:
   No offsite contamination is expected, and no off-site soil or groundwater samples were collected.

3. Do existing data address potential migration pathways of contaminants at the site?

   X Yes
   ❑ No
   ❑ Uncertain

   Please provide an explanation for your answer

   While potential migration from impacted soils to groundwater might occur, ecological receptors are not expected to contact groundwater.

4. Do existing data address potential migration pathways of contaminants in offsite affected areas?

   □ Yes
   ❑ No
   ❑ Uncertain
   X No offsite contamination

   Please provide an explanation for your answer:

   See response to No. 3 presented previously. Also, no off-site soil contamination is expected.

5. Are there visible indications of stressed habitats or receptors on or near (i.e., within 0.5 miles) the site that may be the result of a chemical release? If yes, explain. Attach photographs if available.

No.

6. Is the location of the contamination such that receptors might be reasonably expected to come into contact with it? For soil, this means contamination in the soil 0 to 5 feet below ground surface (bgs). If yes, explain.

Yes. Some soil samples were collected in site areas where receptors might contact detected constituents.

7. Are receptors located in or using habitats where chemicals exist in air, soil, sediment or surface water? If yes, explain.

Yes. See response to No. 6 presented above.

8. Could chemicals reach receptors via groundwater? Can chemicals leach or dissolve to groundwater? Are chemicals mobile in groundwater? Does groundwater discharge into receptor habitats? If yes, explain.

No. Groundwater was not encountered beneath the site.

9. Could chemicals reach receptors through runoff or erosion? Answer the following questions:

What is the approximate distance from the contaminated area to the nearest watercourse or arroyo?

- ❑ 0 feet (i.e., contamination has reached a watercourse or arroyo)
- ❑ 1-10 feet
- ❑ 11-20 feet
- ❑ 21-50 feet
- ❑ 51-100 feet
- ❑ 101-200 feet
- ❑ > 200 feet
- ❑ > 500 feet
- X > 1000 feet

What is the slope of the ground in the contaminated area?

- X 0-10%
- ❑ 10-30%
- ❑ > 30%

What is the approximate amount of ground and canopy vegetative cover in the contaminated area?

- ❑ < 25%
- X 25-75%
- ❑ > 75%

Is there visible evidence of erosion (e.g., a rill or gully) in or near the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

Do any structures, pavement, or natural drainage features direct run-on flow (i.e., surface flows originating upstream or uphill from the area of concern) into the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

10. Could chemicals reach receptors through the dispersion of contaminants in air (e.g., volatilization, vapors, fugitive dust)? If yes, explain.

Yes. However, detected concentrations of constituents in soil do not generally exceeding relevant background values or ecological screening criteria (see screening assessment in main text).

11. Could chemicals reach receptors through migration of non-aqueous phase liquids (NAPLs)? Is a NAPL present at the site that might be migrating towards receptors or habitats? Could NAPL discharge contact receptors or their habitat?

No NAPLs are present at the site.

12. Could receptors be impacted by external irradiation at the site? Are gamma emitting radionuclides present at the site? Is the radionuclide contamination buried or at the surface?

No. No radionuclide contamination is expected to be present at the site.

PHOTOGRAPHIC DOCUMENTATION

During the site visit(s), photographs should be taken to document the current conditions at the site and to support the information entered in the checklist. For example, photographs may be used to document the following:

- The nature, quality, and distribution of vegetation at the site
- Receptors or evidence of receptors
- Potentially important ecological features, such as ponds and drainage ditches
- Potential exposure pathways
- Any evidence of contamination or impact

SUMMARY OF OBSERVATIONS AND SITE SETTING

Include information on significant source areas and migration pathways that are likely to constitute complete exposure pathways.

Although potentially complete exposure pathways exist (e.g. direct contact with surface soil), significant source areas are not present, as results of the screening assessment (see main text) indicate that detected concentrations of constituents in soil do not generally exceeding relevant ecological screening criteria.

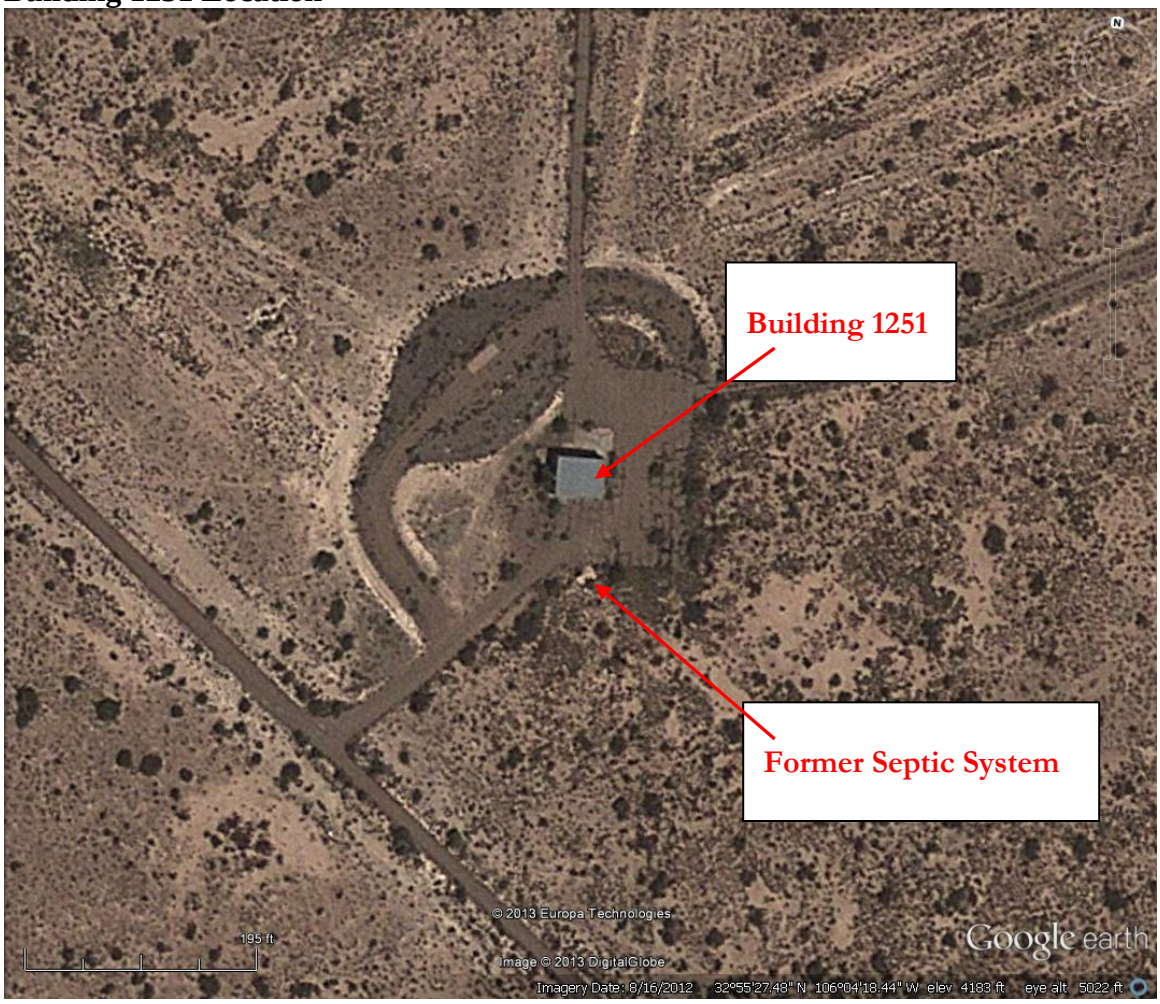
Checklist Completed by William Squire

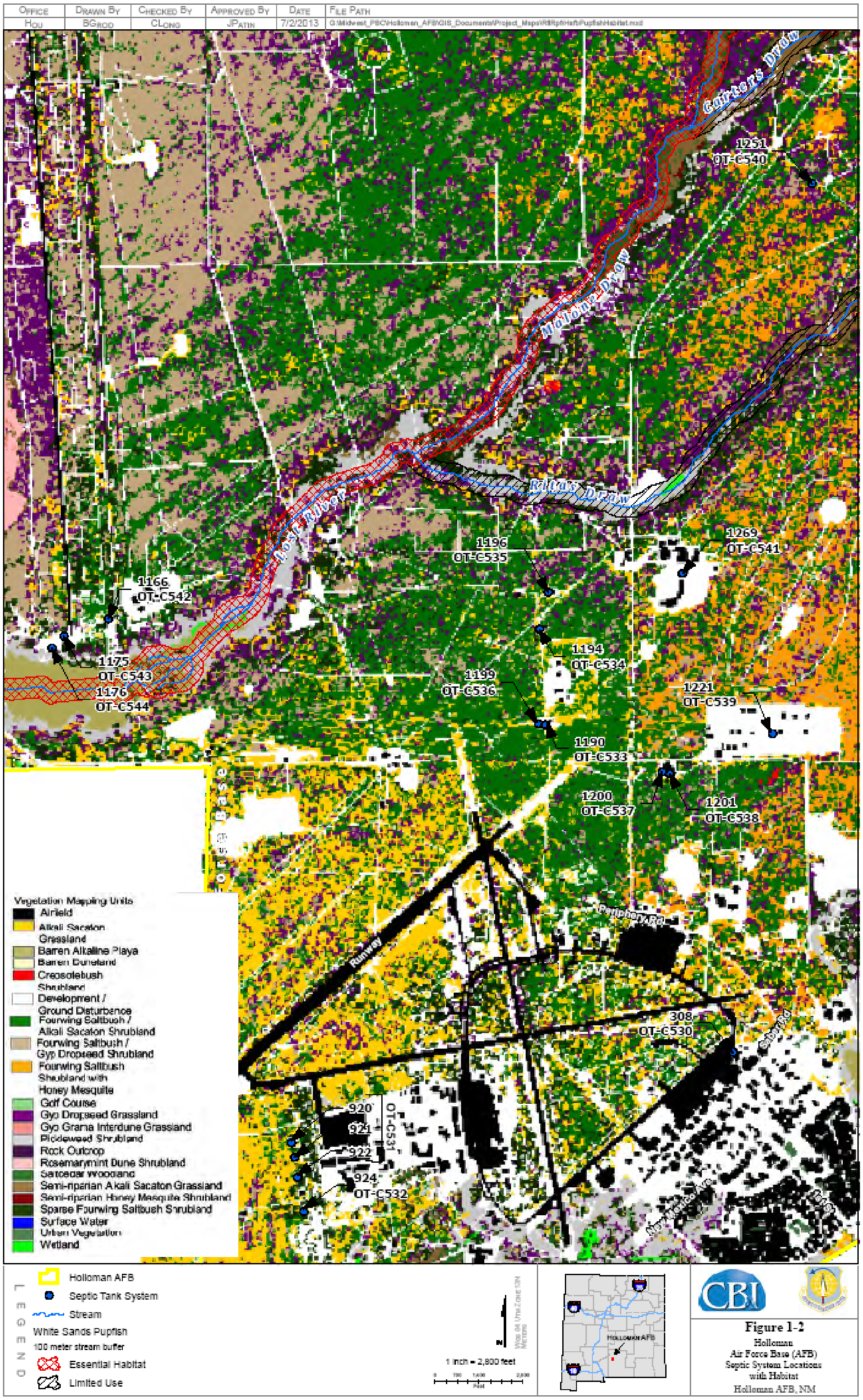
Affiliation CB&I Federal Services, LLC.

Author Assisted by William Stanhope, CB&I Federal Services, LLC.

Date July 30, 2013

Building 1251 Location

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Carters Draw
Malone Draw
Ritas Draw
Lost River
1251
OT-C540
1269
OT-C541
1196
OT-C535
1166
OT-C542
1175
OT-C543
1176
OT-C544
1194
OT-C534
1199
OT-C536
1221
OT-C539
1190
OT-C533
1200
OT-C537
1201
OT-C538
Periphery Rd
Runway
308
OT-C530
920
921
922
924
OT-C531
OT-C532
Vegetation Mapping Units
Airfield
Alkali Sacaton Grassland
Barren Alkaline Playa
Barren Duneland
Creosotebush Shrubland
Development / Ground Disturbance
Fourwing Saltbush / Alkali Sacaton Shrubland
Fourwing Saltbush / Gyp Dropseed Shrubland
Fourwing Saltbush Shrubland with Honey Mesquite
Golf Course
Gyp Dropseed Grassland
Gyp Grama Interdune Grassland
Pickleweed Shrubland
Rock Outcrop
Rosemarymint Dune Shrubland
Saltcedar Woodland
Semi-riparian Alkali Sacaton Grassland
Semi-riparian Honey Mesquite Shrubland
Sparse Fourwing Saltbush Shrubland
Surface Water
Urban Vegetation
Wetland
LEGEND
Holloman AFB
Septic Tank System
Stream
White Sands Pupfish
100 meter stream buffer
Essential Habitat
Limited Use
1 inch = 2,800 feet
Holloman AFB
Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
with Habitat
Holloman AFB, NM

REFERENCES

Holloman Air Force Base (HAFB), 2011. *Integrated Natural Resource Management Plan*, February.

Holloman Air Force Base (HAFB), 2007. *Holloman Air Force Base Septic Tanks*, April.

New Mexico Environment Department (NMED), 2012. *Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document*, Hazardous Waste Bureau and Ground Water Quality Bureau, February, Table A-1 updated June 2012.

North Wind, Inc., 2008. *Technical Memorandum Summarizing Decommissioning Work Conducted on Inactive Septic Tanks at Holloman AFB*, March.

TABLE 1
EXAMPLES OF SENSITIVE ENVIRONMENTS

National Parks and National Monuments

Designated or Administratively Proposed Federal Wilderness Areas

National Preserves

National or State Wildlife Refuges

National Lakeshore Recreational Areas

Federal land designated for protection of natural ecosystems

State land designated for wildlife or game management

State designated Natural Areas

Federal or state designated Scenic or Wild River

All areas that provide or could potentially provide critical habitat[1] for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern

All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes

All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)

---

1 Critical habitats are defined by the Endangered Species Act (50 CFR §424.02(d)) as:

> 1) Specific areas within the geographical area currently occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (ii) that may require special management considerations or protection, and 2) Specific areas outside the geographical area occupied by a species at the time it is listed upon a determination by the Secretary [of Interior] that such areas are essential for the conservation of the species.

All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)

All areas that provide or could potentially provide habitat for song birds as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-13)

All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)

All areas that provide or could potentially provide habitat for horned toads and Bullfrogs as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, resp.)

All perennial waters (e.g., rivers, lakes, playas, sloughs, ponds, etc)

All ephemeral drainage (e.g., arroyos, puddles/pools, intermittent streams, etc) that provide significant wildlife habitat or that could potentially transport contaminants off site to areas that provide wildlife habitat

All riparian habitats

All perennial and ephemeral wetlands (not limited to jurisdictional wetlands)

All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle.

ATTACHMENT B

ECOLOGICAL SITE EXCLUSION CRITERIA CHECKLIST AND DECISION TREE

1. NEW MEXICO ECOLOGICAL EXCLUSION CRITERIA CHECKLIST

The following questions are designed to be used in conjunction with the Ecological Exclusion Criteria Decision Tree (Figure 1). After answering each question, refer to the Decision Tree to determine the appropriate next step. In some cases, questions will be omitted as the user is directed to another section as indicated by the flow diagram in the Decision Tree. For example, if the user answers "yes" to Question 1 of Section I, he or she is directed to proceed to Section II.

I. Habitat

In the following questions, "affected property" refers to all property on which a release has occurred or is believed to have occurred, including off-site areas where contamination may have occurred or migrated.

1. Are any of the below-listed sensitive environments at, adjacent to, or in the locality1 of the affected property?

   - National Park or National Monument
   - Designated or administratively proposed Federal Wilderness Area
   - National Preserve
   - National or State Wildlife Refuge
   - Federal or State land designated for wildlife or game management
   - State designated Natural Areas
   - All areas that are owned or used by local tribes
   - All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle
   - All areas that provide or could potentially provide habitat for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern
   - All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes
   - All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)
   - All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)
   - All areas that provide or could potentially provide habitat for song birds as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game

1 *Locality* of the site refers to any area where an ecological receptor is likely to contact site-related chemicals. The locality of the site considers the likelihood of contamination migrating over time and places the site in the context of its general surrounding. Therefore, the locality is typically larger than the site and the areas adjacent to the site.

and Fish, 17-2-13)

- All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)
- All areas that provide or could potentially provide habitat for horned toads and bullfrogs as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, respectively)

2. Does the affected property contain land areas which were not listed in Question 1, but could be considered viable ecological habitat? The following are examples (but not a complete listing) of viable ecological habitats:

- Wooded areas
- Shrub/scrub vegetated areas
- Open fields (prairie)
- Other grassy areas
- Desert areas
- Any other areas which support wildlife and/or vegetation, excluding areas which support only opportunistic species (such as house mice, Norway rats, pigeons, etc.) that do not serve as prey to species in adjacent habitats.

The following features are <u>not</u> considered ecologically viable:

- Pavement
- Buildings
- Paved areas of roadways
- Paved/concrete equipment storage pads
- Paved manufacturing or process areas
- Other non-natural surface cover or structure

3. Does the affected property contain any perennial or ephemeral aquatic features which were not listed in Question 1?

II. Receptors

1. Is any part of the affected property used for habitat, foraging area, or refuge by any rare, threatened, or endangered species (plant *or* animal), or otherwise protected species (e.g., raptors, migratory birds)?

2. Is any part of the affected property used for habitat, foraging area, or refuge by any species used as a recreational (e.g., game animals) and/or commercial resource?

3. Is any part of the affected property used for habitat, foraging area, or refuge by any plant or animal species? This includes plants considered "weeds" and opportunistic insect and animal species (such as cockroaches and rats) if they are used as a food source for other species in the area.

III. Exposure Pathways

1. Could receptors be impacted by contaminants via direct contact?

   Is a receptor located in or using an area where it could contact contaminated air, soil[3], or surface water?

For Questions 2 and 3, note that one must answer "yes" to all three bullets in order to be directed to the "exclusion denied" box of the decision tree. This is because answering "no" to one of the questions in the bullet list indicates that a complete exposure pathway is not present. For example, in Question 2, if the chemical cannot leach or dissolve to groundwater (bullet 1), there is no chance of ecological receptors being exposed to the chemical through contact with contaminated groundwater. Similarly, the responses to the questions in Question 4 determine whether a complete pathway exists for exposure to NAPL.

2. Could receptors contact contaminants via groundwater?
   - Can the chemical leach or dissolve to groundwater[4]?
   - Can groundwater mobilize the chemical?
   - Could (does) contaminated groundwater discharge into known or potential receptor habitats?

3. Could receptors contact contaminants via runoff (i.e., surface water and/or suspended sediment) or erosion by water or wind?
   - Are chemicals present in surface soils?
   - Can the chemical be leached from or eroded with surface soils?
   - Is there a receptor habitat located downgradient of the leached/eroded surface soil?

---

3 For soil, this means contamination less than 5 feet below ground surface (bgs).

4 Information on the environmental fate of specific chemicals can be found on the Internet at *http://www.epa.gov/opptintr/chemfact/* or at a local library in published copies of the *Hazardous Substances Data Bank*.

4. Could receptors contact contaminants via migration of non-aqueous phase liquids (NAPL)?

- Is NAPL present at the site?
- Is NAPL migrating toward potential receptors or habitats?
- Could NAPL discharge impact receptors or habitats?

Figure 1 -Ecological Exclusion Criteria Decision Tree

(Refer to corresponding checklist for the full text of each question)

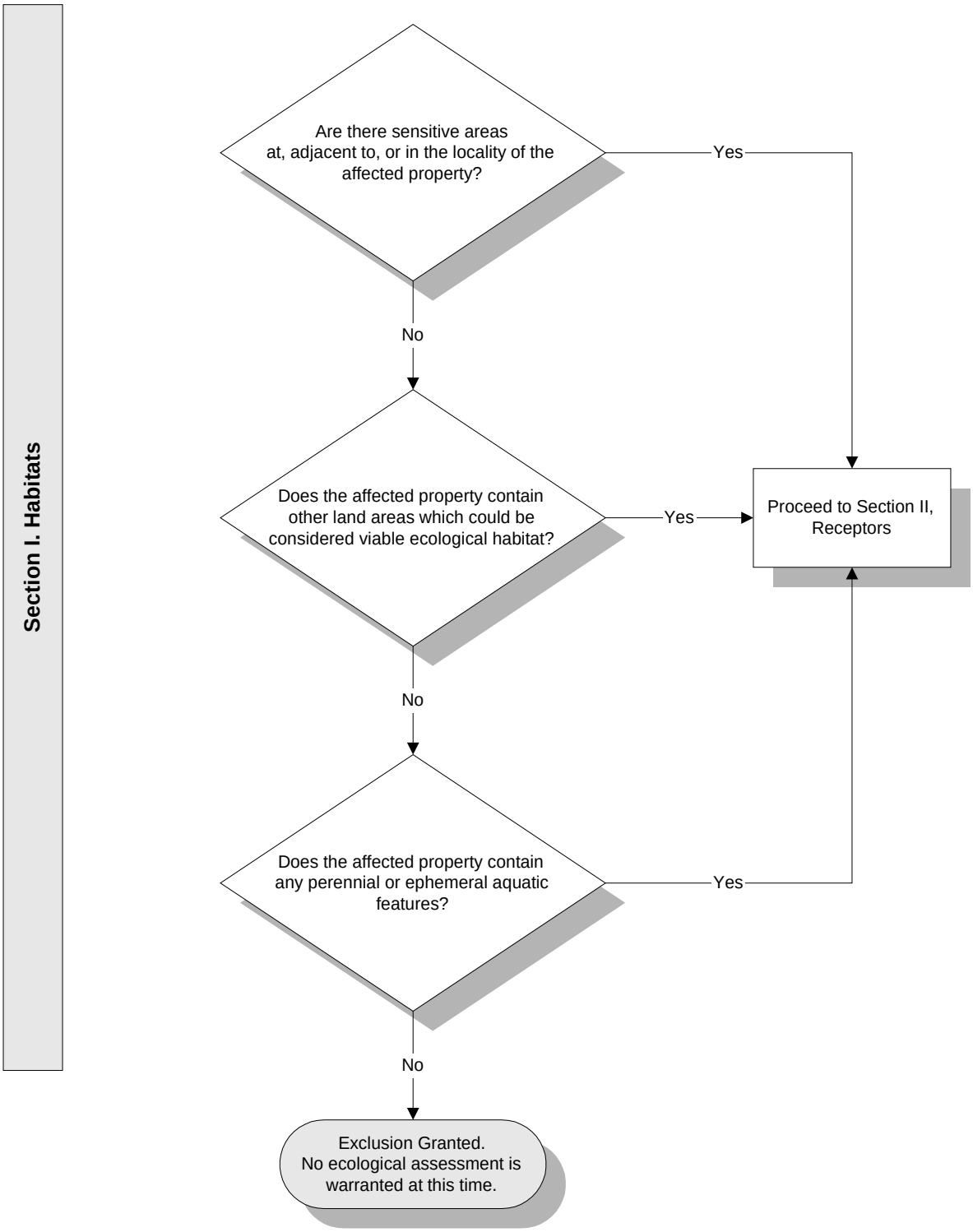

Figure 1 - Exclusion Criteria Decision Tree (continued)

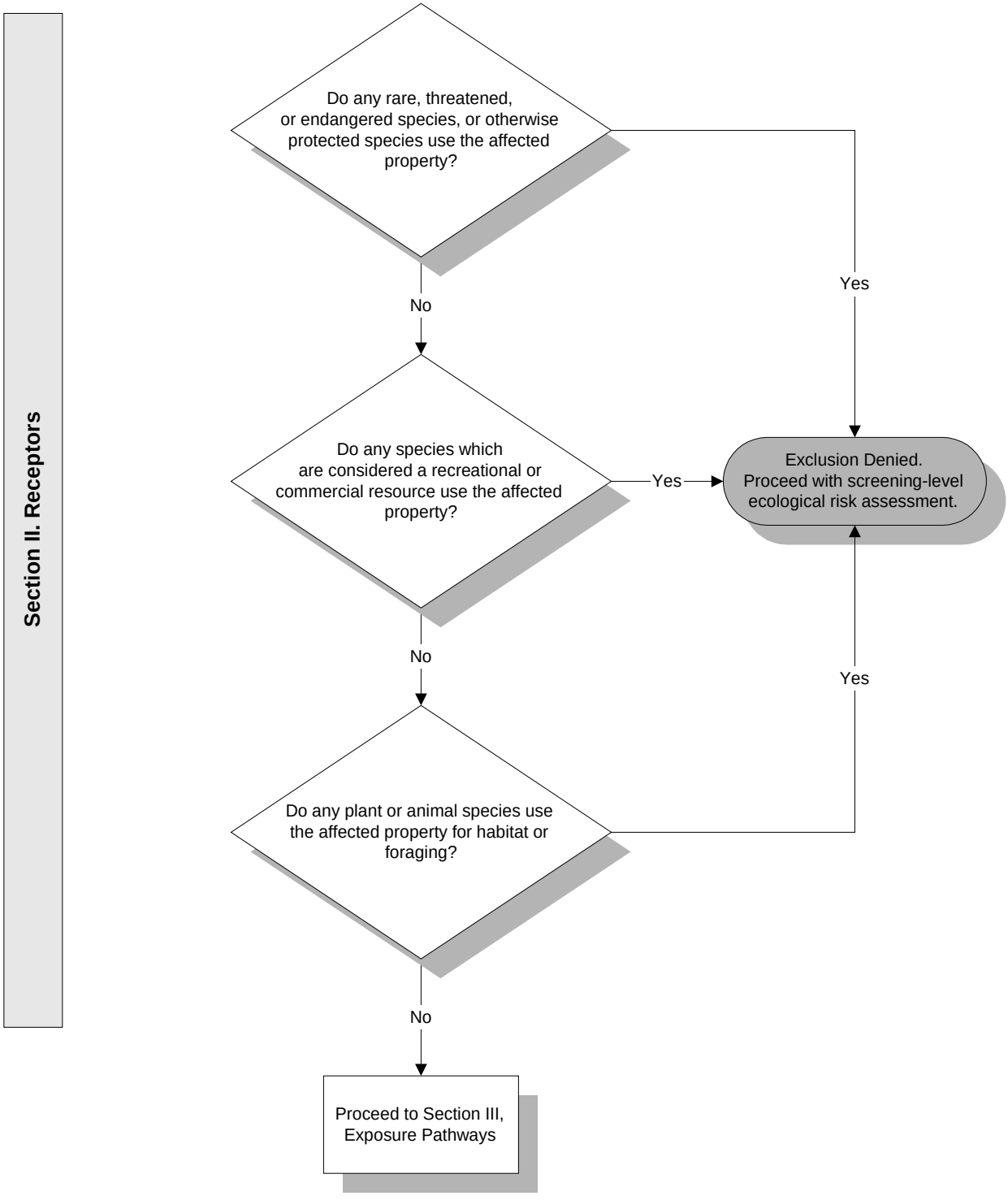

Figure 1 - Exclusion Criteria Decision Tree (continued)

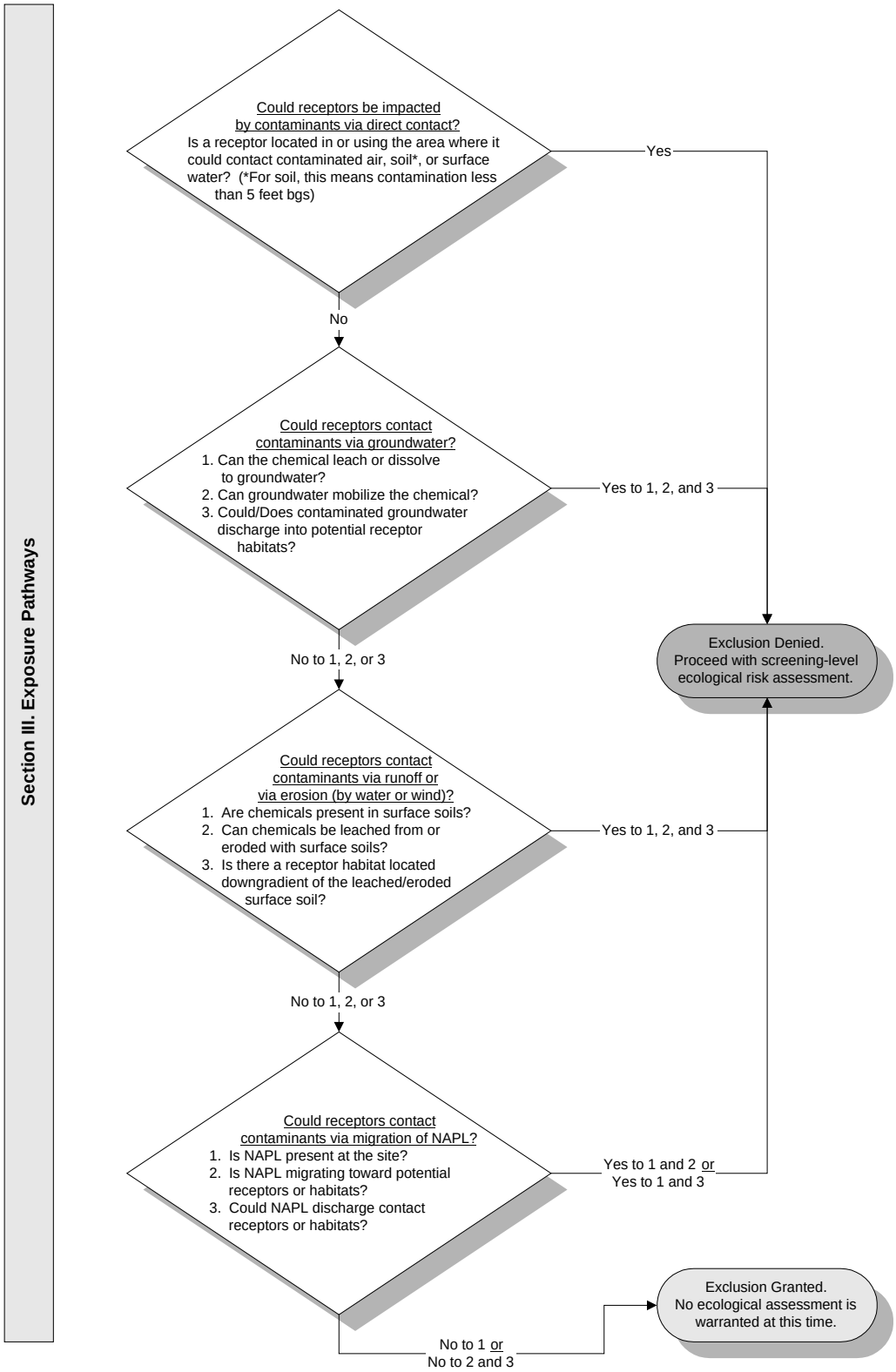

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1251 (OT-C540) RFI Report
Holloman Air Force Base, New Mexico

Analyte		Sample Number	OTC540-IS-0001-062012		OTC540-IS-0003-062012		OTC540-IS-0005-062012		OTC540-IS-0007-062112	
		Sample Date	6/20/2012		6/20/2012		6/20/2012		6/21/2012	
		Location	OT-C540-Station 1 influent line to tank		OT-C540-Station 2 septic tank		OT-C540-Station 3 effluent line to tank		OT-C540-Station 4 leach field	
		Depth (ft bgs)	3 - 5		7 - 9		3 - 5		3 - 5	
	Background Values - Soil (mg/kg)[a]	LANL (2012) ESLs (mg/kg)[b]	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	**80.4**		**95.4**		**83.9**		**87.7**	
METALS (mg/kg)										
ALUMINUM	13722	pH Dependent	5800		4390		3400		4160	
ARSENIC	3.7	6.8 / 68	2	J	1.3	J	1	U	1.5	J
BARIUM	169.3	110 / 260	68.4	J	44.8	J	50.4	J	139	
CALCIUM	317332	NSV	212000		177000		255000		165000	
CHROMIUM	25	28 / 280	5	J	6.3		2.6	J	2.9	J
COBALT	7.7	13 / 130	2.3	J	2.6	J	1.5	J	1.3	J
COPPER	13	15 / 46	3.1	J	4.5	J	2.7	J	1.8	J
IRON	23049	NSV	5060		5720		2640		2900	
LEAD	10.9	14 / 28	3.4	J	3.7	J	1.2	J	1.7	J
MAGNESIUM	16991	NSV	4230		6750		3160		2100	J
MANGANESE	393	220 / 1,100	99.1		329		47.5		38.8	
NICKEL	17.4	9.7 / 19	4.6	J	6	J	3.1	J	2.9	J
POTASSIUM	5077	NSV	1660	J	832	J	1130	J	1010	J
SODIUM	5196	NSV	560	U	490	U	605	J	1900	J
VANADIUM	42.6	0.025 / 0.25	15.2	J	11.8	J	7.4	J	8.3	J
ZINC	54.6	48 / 480	14		28.3		7.7	J	8.2	J

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1251 (OT-C540) RFI Report
Holloman Air Force Base, New Mexico

LANL (2012) ESL values represented as: No-Effect ESL / Low-Effect ESL (e.g., 6.8 / 68 for arsenic)

LANL (2012) ESL Exceeded

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] Los Alamos National Laboratory (LANL), 2012, ECORISK Database, LA-UR-12-24548, Release 3.1, October.

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
HAFB = Holloman Air Force Base
J = estimated value
mg/kg = milligrams per kilogram
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Final
RCRA Facility Investigation Report
Group 1 – Building 1166 (OT-C542)
Holloman Air Force Base, New Mexico

Prepared for U.S. Air Force Civil Engineer Center
2261 Hughes Ave., Suite 155
Lackland Air Force Base, Texas 78236-9861

Prepared by Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

Contract No. FA8903-09-D-8580
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October 2013

Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)

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Acronyms and Abbreviations

AFB	Air Force Base
bgs	below ground surface
COPC	constituent of potential concern
DPT	direct push technology
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
ESL	ecological screening levels
ft	foot/feet
GPR	ground-penetrating radar
GRO	gasoline range organics
HI	hazard index
IDW	investigation-derived waste
LANL	Los Alamos National Laboratory
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MCL	maximum contaminant level
MDC	maximum detected concentration
MDL	method detection limits
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
ORO	oil range organics
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RSL	Regional Screening Level
Shaw	Shaw Environmental & Infrastructure, Inc. (a CB&I Company)
SLERA	screening level ecological risk assessment
SSL	soil screening level
SVOC	semivolatile organic compound
TAL	target analyte list
TDS	total dissolved solids
TPH	total petroleum hydrocarbons
UCL	upper confidence limit
USACE	U.S. Army Corps of Engineers
VOC	volatile organic compound
WQS	water quality standard

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1.0 INTRODUCTION

Shaw Environmental & Infrastructure. Inc. (Shaw), a CB&I company, prepared this Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for the Air Force Civil Engineer Center (formerly the Air Force Center for Engineering and the Environment) under Contract No. FA8903-09-D-8580, Task Order No. 0013, Modification 01. Results presented in this report are from the investigation and corrective measures of the removed septic tank formerly located at Building 1166 (OT-C542) at Holloman Air Force Base (AFB), New Mexico, which was one of the fifteen Group 1 septic tank sites under the Midwestern Region Performance-Based Remediation Contract. This RFI Report has been prepared pursuant to the requirements of the Holloman AFB Hazardous Waste Facility RCRA Permit No. NM6572124422 (the Permit) (New Mexico Environment Department [NMED], 2004). The purpose of this RFI was to delineate potential contamination that may have been released to the environment from the Building 1166 septic tank system.

Holloman AFB is situated in south-central New Mexico in the northwest central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). The 15 Group 1 former septic tank sites are located throughout Holloman AFB (Figure 1-2). Each former septic tank is positioned adjacent to a building; as such, each septic tank is also named in reference to its most proximal building as follows: OT-C530 (Building 308), OT C531 (Buildings 920, 921, and 922), OT-C532 (Building 924), OT-C533 (Building 1190), OT-C534 (Building 1194), OT-C535 (Building 1196), OT-C536 (Building 1199), OT-C537 (Building 1200), OT-C538 (Building 1201), OT-C539 (Building 1221), OT-C540 (Building 1251), OT-C541 (Building 1269), OT-C542 (Building 1166), OT-C542 (Building 1175), and OT-C544 (Building 1176)]. This report presents a summary of the RFI work conducted at removed septic tank OT-C542 at Building 1166.

Building 1166 was constructed in 1960. The 4,955 square foot (ft) building is located at the south end of the High Speed Test Track, and is known as the Break Setter Building. Building 1166 contained two toilets, a lavatory, a urinal, and a shower during the time it was connected to the septic system. The *Holloman Air Force Septic Tanks* (U.S. Air Force, 2007) report in Appendix A indicates that the 450-gallon septic tank was removed as of 2006.

1.1 Purpose of the Investigation

Investigative activities were undertaken at Holloman AFB to determine the nature and extent of contamination, and propose recommendations for either closure or additional corrective action, if necessary, at 15 inactive, abandoned, or removed septic tank systems, following the

general guidance for closing septic systems found in 20.7.3.307 New Mexico Administrative Code (NMAC) Standards - Abandoned Sewers and On-Site Liquid Waste Systems.

Project quality objectives for each septic tank site consisted of the following:

- Gather and review all site historical information
- Identify septic tank components and historical uses
- Remove septic tank contents and contaminated soil (where necessary), and abandon the tank (where necessary)
- Determine the nature and extent of residual constituents of concern at each site, including potential pathways to groundwater
- Evaluate the risk at each site
- Develop conclusions and recommendations for each site.

This RFI Report presents the data collected to meet these project quality objectives at the Building 1166 abandoned septic tank.

1.2 Scope of Activities

This RFI Report describes all activities associated with the removed septic tank investigation and remediation at Building 1166, including soil and groundwater sampling, sample analysis, as-built pipe mapping, and site boundary survey. All work was performed in accordance with the Holloman AFB *Basewide Septic Tank Solid Waste Management Unit RFI Work Plan* (U.S. Army Corps of Engineers [USACE], 2010) and the *Quality Program Plan* (Shaw, 2012a). The *Quality Program Plan* (Shaw, 2012a) contains the Site Safety and Health Plan; the Uniform Federal Policy – Sampling and Analysis Plan/Quality Assurance Project Plan; and the Construction Quality Plan, which defines the methodology and practices that were used to control construction work during the performance of the RFI.

1.3 Regulatory Setting

The Holloman AFB RCRA Permit (The Permit) (NMED, 2004) established the general and specific standards and activities for managing hazardous waste pursuant to Subtitle C of RCRA, the New Mexico Hazardous Waste Act, and the New Mexico Hazardous Waste Management Regulations. The Permit also set forth requirements for investigation, notification, corrective action, and reporting for the storage, management, and releases of hazardous wastes.

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The 15 septic systems were either abandoned, inactive, or previously removed, as indicated in *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) report (Appendix A), and were not listed in the Permit (NMED, 2004). The *RFI Work Plan* (USACE, 2010) was approved by NMED in a letter dated January 13, 2010 (NMED, 2010). The NMED-approved *RFI Work Plan* (USACE, 2010) contained investigation activities only; therefore Shaw submitted a *Final Voluntary Corrective Measures Request-Septic Tanks Sites* (Shaw, 2012b) to include remediation and closure tasks that address septic system abandonment using 20.7.3.307 NMAC (Abandoned Sewers and On-Site Liquid Waste Systems). NMED has primary regulatory responsibility for the septic system sites; therefore, corrective action must be performed under Title 20 NMAC.

The septic tank investigations were based on action/cleanup levels stipulated in Appendix 4-F of the Permit to be protective of human health and the environment. Permit Appendix 4-F specifies that soil contaminant concentrations be compared with the NMED residential soil screening levels (SSL), as presented in the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a), or the *U.S. Environmental Protection Agency (EPA) Regions 3, 6, and 9 Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites* if no NMED SSL has been established (EPA, 2012a). Holloman AFB also has NMED-approved background concentrations for metals in soil (NMED, 2012b).

For groundwater, the Permit specifies that the more stringent of either the New Mexico Water Quality Control Commission (NMWQCC) water quality standards (WQS) (20.6.2 NMAC), or the EPA maximum contaminant levels (MCLs) for drinking water, be used for comparison with measured sample concentrations (EPA, 2012b).

1.4 RFI Report Organization

This RFI Report is organized into the following sections:

- **Section 1.0, Introduction**: Identifies the objectives and purpose of this report.
- **Section 2.0, Environmental Setting**: Provides pertinent descriptions of history, location, physiography, topography, surface water, hydrology, regional geology, soil types, regional hydrogeology, climate, current and future land use, and current and future water use for Holloman AFB.
- **Section 3.0, Source Characterization**: Presents the data collection techniques and locations, as well as analytical methods.

- **Section 4.0, Investigation Results and Evaluation**: Details the soil analytical results, and evaluates the human health risk due to site contaminants.
- **Section 5.0, Data Quality Assurance and Data Quality Control Review**: Summarizes the analytical data validation results.
- **Section 6.0, Conclusions and Recommendations**: Presents the conclusions and recommendations of this RFI report.
- **Section 7.0, References**: Lists the references cited in this report.

In addition to the figures and tables listed in the table of contents, the following appendices are included in this report:

- **Appendix A** – Historical Records
- **Appendix B** – Geophysical Report
- **Appendix C** – Sample Collection Logs
- **Appendix D** – Boring Logs
- **Appendix E** – Well Construction Diagrams
- **Appendix F** – Well Purge Records
- **Appendix G** – Site Survey Data
- **Appendix H** – Laboratory Analytical Data and Data Validation Checklists
- **Appendix I** – Waste Manifests
- **Appendix J** – Risk Evaluation Calculations
- **Appendix K** – Ecological Evaluation.

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2.0 ENVIRONMENTAL SETTING

This section provides background information for Holloman AFB including physical setting, history, topography, climate, soils, geology, hydrology, and land and water use.

2.1 Physical Setting

Holloman AFB is situated in south-central New Mexico, in the northwest-central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). Holloman AFB has a population of 6,000, and occupies 59,639 acres in the northeast quarter of Section 1, Township 17 South, Range 8 East. The White Sands Missile Range testing facilities occupy additional land extending northward from the base. Privately- and publicly-owned lands border the remainder of Holloman AFB. The major highway servicing Holloman AFB is Highway 70, which runs southwest from the town of Alamogordo, New Mexico, and separates Holloman AFB from publicly owned lands to the south. Alamogordo, New Mexico, which has a population of 30,401 according to the 2010 U.S. Census, is located approximately 7 miles east of the base.

2.2 Holloman Air Force Base History

Holloman AFB was first established in 1942 as Alamogordo Army Air Field. From 1942 through 1945, Alamogordo Army Air Field served as the training grounds for over 20 different flight groups, flying primarily B-17s, B-24s, and B-29s. After World War II, most operations had ceased at the base. In 1947, Air Material Command announced the air field would be its primary site for the testing and development of unmanned aircraft, guided missiles, and other research programs. On January 13, 1948, the Alamogordo installation was renamed in honor of the late Colonel George V. Holloman, a pioneer in guided missile research. In 1968, the 49th Tactical Fighter Wing arrived at Holloman AFB, and has remained since. Today, Holloman AFB also serves as the training center for the German Air Force's Tactical Training Center.

2.3 Physiography and Topography

Holloman AFB is located within the Sacramento Mountains physiographic province on the western edge of the Sacramento Mountains. The base is approximately 59,600 acres in area, and is located at a mean elevation of 4,093 ft above mean sea level. The region is characterized by high tablelands with rolling summit plains; cuesta-formed mountains dipping eastward; and west-facing escarpments, with the wide bracketed basin forming the basin and range complex. Holloman AFB is located in the Tularosa Basin, which is part of the Central Closed Basins. The bordering mountains rise abruptly to altitudes of 7,000 to 12,000 ft above mean sea level. The San Andres Mountains bound the basin to the west

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(approximately 30 miles) with the Sacramento Mountains approximately 10 miles to the east (Figure 2-1). At its widest, the basin is approximately 60 miles east to west, and stretches approximately 150 miles north to south.

2.4 Climate

As a whole, New Mexico has a mild, arid to semiarid continental climate characterized by light precipitation totals, abundant sunshine, relatively low humidity, and relatively large annual and diurnal temperature ranges (Western Regional Climate Center, 2013). The climate of the Central Closed Basins varies with elevation. The base is located in the low areas and is characterized by warm temperatures and dry air. Daytime temperatures often exceed 100 degrees Fahrenheit in the summer months, and are in the middle 50s (degrees Fahrenheit) in the winter. A preponderance of clear skies and relatively low humidity permits rapid nighttime cooling resulting in average diurnal temperature ranges of 25 to 35 degrees Fahrenheit. Potential evapotranspiration, at 67 inches per year, significantly exceeds annual precipitation, usually less than 15 inches. Arid conditions resulting from very low rainfall amounts, coupled with the topographically induced wind patterns combining with the sparse vegetation, tend to cause localized “dust devils.” The annual rainfall for Alamogordo is 12 inches per year. Much of the precipitation falls during the midsummer monsoonal period (July and August) as brief, yet frequent, intense thunderstorms culminating in 30 to 40 percent of the total annual rainfall.

2.5 Regional Geology and Soils

2.5.1 Geology

The sedimentary rocks that make up the adjacent mountain ranges are between 250 and 500 million years old (New Mexico Bureau of Geology and Mineral Resources, 2012). During the period when the area was submerged beneath the shallow intracontinental sea, the layers of limestone, shale, gypsum, and sandstone were formed. In time, these layers were pushed upward through various tectonic forces forming a large bulge on the surface. Approximately 10 million years ago, the center began to subside resulting in a vertical drop of thousands of ft, leaving the edges still standing (the present-day Sacramento and San Andres mountain ranges). In the millions of years following, rainfall, snowmelt, and wind eroded the mountain sediments depositing them in the valley (i.e., Tularosa Basin). Water carrying eroded limestone, dolomite, gravel, and other materials continue to flow into the basin.

As the Tularosa Basin is a bolson, which is a basin with no surface drainage outlet, sediments carried by surface water into a closed basin are bolson deposits. The overlying alluvium generally consists of unconsolidated gravels, sands, and clays. Soils in the basin are derived from the adjacent ranges as erosional deposits of limestone, dolomite, and gypsum. A fining

sequence from the ranges towards the basin's center characterizes the area with the near-surface soils as alluvial, eolian, and lacustrine deposits. The alluvial fan deposits are laterally discontinuous units of interbedded sand, silt, and clay while the eolian deposits consist primarily of gypsum sands. The eolian and alluvial deposits are usually indistinguishable due to the reworking of the alluvial sediment by eolian processes. The playa, or lacustrine deposits, consist of clay containing gypsum and are contiguous with the alluvial fan and eolian deposits throughout the base. Stiff caliche layers, varying in thickness, have been identified at different areas of the base.

2.5.2 Soils

The U.S. Natural Resources Conservation Service (formerly the Soil Conservation Service) has identified two soil associations in the vicinity of Holloman AFB: (1) the Holloman-Gypsum Land-Yesum Complex, and (2) the Mead silty clay loam (Figure 2-2) (U.S. Department of Agriculture, 1981). The permeability of these horizons ranges from 4×10^{-4} to 1×10^{-3} centimeters per second.

The Holloman-Gypsum Land-Yesum Complex, 0 to 5 percent sloped soil, consists of larger areas of shallow and deep, well-drained soils and areas of exposed gypsum. The Holloman soil makes up approximately 35 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 13 inches of the substratum is pink, very fine sandy loam that is very high in gypsum. Below that, the substratum is white gypsum to a depth of more than 60 inches. This soil is calcareous and mildly alkaline to moderately alkaline. Permeability is moderate. Available water capacity is very low.

Gypsum Land makes up approximately 30 percent of the Holloman-Gypsum Land-Yesum Complex (0 to 5 percent slopes). Typically, less than 1 inch of very fine sandy loam overlies soft to hard, white gypsum. The deep Yesum consists of very fine sandy loam that makes up approximately 20 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 9 inches of the substratum is light brown, fine sandy loam that is very high in gypsum. Below that, the substratum is pink, very fine sandy loam to a depth of more than 60 inches. The soil is calcareous throughout, and is mildly alkaline. Permeability is moderate. Available water capacity is moderate. Many fine gypsum crystals are found throughout the profile.

The soil type found across the main drainage area for the installation is Mead silty clay loam, 0 to 1 percent slopes. This deep, poorly drained, nearly level soil is on outer fringes of alluvial fans. This soil formed in fine textured alluvium over lacustrine lake sediment. It is very high in salt content because of periodic flooding and poor drainage. Slopes are smooth and concave. Typically, the surface layer is reddish brown, silty clay loam, and clay loam

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approximately 5 inches thick. The substratum, to a depth of 48 inches, is light reddish brown clay that has a high content of salt. Below that, the substratum is lacustrine material of variable texture and color to a depth of more than 60 inches. Included within this soil are areas of Holloman soils and Gypsum Land along the margins of the unit of steep, short gully sides and knolls. These inclusions make up approximately 15 percent of the map unit for this soil type. Individual areas are generally smaller than 10 acres. This soil is moderately calcareous throughout and is moderately to strongly alkaline. It has a layer of salt that is more soluble than gypsum. Permeability is very low. Available water capacity is low (USACE, 2010).

2.6 Regional Hydrogeology

Groundwater occurs as an unconfined aquifer in the unconsolidated deposits of the central basin, with the primary source of recharge as rainfall percolation and minor amounts of stream runoff along the western edge of the Sacramento Mountains. Surface water/rainfall migrates downward into the alluvial sediments at the edge of the shallow aquifer near the ranges and flows through progressively finer-grained sediments towards the central basin. Because the Tularosa Basin is a closed system, water that enters the area leaves either through evaporation or percolation. This elevated amount of percolation results in a fairly high water table. Beneath Holloman AFB, groundwater ranges from 5 to 50 ft below ground surface (bgs). Flow for the base is generally towards the southwest with localized influences from the variations in the topography of the base (Figure 2-3). In the northern and western portions of the base, groundwater flows more to the west towards the Ritas Draw, Malone Draw, and Lost River drainages. Groundwater flow is affected by local topography in areas immediately adjacent to arroyos, where groundwater flows directly toward the drainages regardless of the regional flow pattern.

Groundwater in the Tularosa Basin is of potable quality at the recharge areas in close proximity to the Sacramento Mountains and becomes increasingly mineralized toward the central portion of the basin and discharge areas. The majority (over 70 percent) of the Environmental Restoration Program sites located across Holloman AFB have groundwater monitoring wells containing water with an average total dissolved solids (TDS) concentration greater than 10,000 milligrams per liter (mg/L). These TDS data support the hypothesis that TDS concentrations below 10,000 mg/L at Holloman AFB are caused by dilution of natural groundwater quality from leaking water lines and surface irrigation from the domestic water supply. TDS concentrations greater than 10,000 mg/L exceed the NMWQCC limit as potable water (20.6.2 NMAC), and thus, the groundwater beneath Holloman AFB has been designated as unfit for human consumption. Likewise, the EPA guidelines have identified the groundwater as a Class IIIB water source, characterized by TDS concentrations exceeding 10,000 mg/L, and is characterized by a low degree of

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interconnection with adjacent surface water or groundwater of a higher class. Groundwater does not discharge or connect to any adjacent aquifers, because the Tularosa Basin is a closed basin. Adjacent surface waters include Lost River and Lake Holloman, which also have high concentrations of TDS, and are not considered potential drinking water sources.

2.7 Surface Water and Hydrology

The Tularosa Basin contains all of the surface flow in its boundaries. The nearest inflow of surface waters to Holloman AFB comes from the Lost River, located in the north-central region of the base. The upper reaches of the Three Rivers and the Sacramento River are perennial in the basin. Holloman AFB is dissected by several southwest-trending arroyos that control the surface drainage. Hay Draw arroyo is located in the far north. Malone and Ritas Draws, which drain into the Lost River and Dillard Draw arroyos, are located along the eastern perimeter of the base. Approximately 10,000 years ago, indications are that a much wetter climate existed. The present-day Lake Otero encompassed a much larger area, possibly upwards of several hundred square miles. Its remains are the Alkali Flat and Lake Lucero. Lake Lucero is a temporary feature of merely a few inches in depth during the rainy season.

Ancient lakes and streams deposited water-bearing deposits over the older bedrock basement materials. Fractures, cracks, and fissures in the Permian and Pennsylvanian bedrock yield small quantities of relatively good-quality water in the deeper peripheral. Potable water is only found from wells near the edges of the basin, with more saline water towards the center. Two of the principal sources of potable water are: (1) a long narrow area on the upslope sides of Tularosa and Alamogordo, and (2) in the far southwestern part of the basin. A portion of the city of Alamogordo's water, as well as Holloman AFB's water, is supplied from Bonito Lake (which is in the Pecos River Basin).

2.8 Current and Future Land Use

The land surrounding Holloman AFB consists of residential areas to the east and northeast (city of Alamogordo, New Mexico), rangeland to the south, the White Sands National Monument to the west, and areas where military activities are conducted to the north. The desert terrain of the area immediately surrounding Holloman AFB has limited development, and there are no agricultural operations, residential communities, or large industrial operations located adjacent to the base. The Boles Well Field, a freshwater source for Holloman AFB, is located approximately 6 miles to the southeast of the base. Holloman AFB is an active military installation and is expected to remain active for the foreseeable future. No transfer of military property to the public is anticipated, and public access to the base is restricted. Future land use is not expected to differ significantly from current land use practices (Foster Wheeler Environmental Corporation, 2002).

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2.9 Current and Future Water Use

At present, Holloman AFB receives approximately 50 percent of its freshwater supply from the Boles Well Field. An additional freshwater resource for Holloman AFB, and for the city of Alamogordo, is Bonito Lake, located 60 miles northeast of the Tularosa Basin. Currently, there are no potable supplies of groundwater or surface water located on the base because of poor groundwater quality with TDS concentrations greater than 10,000 mg/L.

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3.0 SOURCE CHARACTERIZATION

This section presents the overall technical approach in general accordance with the *Basewide Septic Tank Solid Waste Management Units, RCRA Facility Investigation Work Plan, Holloman AFB, New Mexico* (USACE, 2010) (except where otherwise noted), and details the investigative and remediation activities that were implemented at Building 1166.

The primary environmental media of concern at Building 1166 are soil and groundwater. The extent of contamination in soil was expected to be relatively local to the removed septic tank location. Therefore, the basic approach was to identify the former septic tank location, and then sample at the individual features of the septic tank system in characterizing the soil. To evaluate the potential impacts to groundwater, a monitoring well was installed in the downgradient end of the leach field. The analytical programs for both soil and groundwater focused on the expected nature of contamination likely to be associated with septic tank discharges.

The RFI conducted at former septic tank OT-C542 (Building 1166) was initiated as part of the Midwestern Region Performance-Based Remediation Contract. The *RFI Work Plan* (USACE, 2010) for this site included the following field work activities: pre-mobilization and mobilization/site setup activities, soil boring advancement, soil sample collection, monitoring well installation and development, groundwater sample collection, sample analysis, investigation-derived waste (IDW) management, and land surveying.

3.1 Pre-mobilization/Mobilization Activities

Several pre-investigation documents were filed and approvals obtained, as follows:

- Civil Engineer Work Request (Air Force Form 332) approval
- Base digging permits (Air Force Form 103, Base Civil Engineering Work Clearance Request) with utility clearances
- Site security clearances
- Facility manager notification of the intended operations.

Prior to the start of activities, a pre-investigation kick-off meeting and site walk-through were conducted with the Air Force Civil Engineer Center resident engineer, Holloman AFB personnel, and Shaw's Construction Manager, to plan for equipment access, equipment staging, decontamination area layout, potential site hazards, emergency evacuation routes, and project schedule.

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Prior to the submittal of the base digging permits, the drilling locations were delineated using marker flags, stakes, and paint. Utility clearance approvals were completed by the appropriate Holloman AFB utility office (i.e., telephone, sewer, water, natural gas, etc.), and by the New Mexico One Call utility clearance system. Upon receipt of the approved digging permit and utility clearances, Shaw's Construction Manager completed a site walk-through to confirm the utility and intrusive work locations. In addition, Shaw performed a site survey prior to the start of drilling activities to search for signs of other buried or overhead utilities.

3.2 Geophysical Investigation

A geophysical investigation was conducted at Building 1166 in an attempt to define the limits of the removed septic system. Methods employed included: visual inspection, electromagnetic induction conductivity detection, ground-penetrating radar (GPR), and electromagnetic pipe and cable location.

Electromagnetic induction conductivity detection ground induction methods are employed to detect broad metal mass anomalies or conductive zones that may be indicative of potential septic tanks, and lateral changes in conductive zones of soil or backfill materials relative to native soil. GPR is used to detect abandoned septic tank excavation sidewalls and fill areas. An electromagnetic pipe and cable survey was performed to detect buried utility lines.

Electromagnetic and GPR surveys were conducted at Building 1166 in June 2012. The location of the removed septic tank and leach field were identified, approximately 40 ft southeast of Building 1166. The locations of individual leach field piping could not be directly detected by the geophysical survey due to the similarity of composition of the clay pipes and the surrounding soil. However, the leach field could be identified by the geophysical survey equipment due to the differences in mineralization and conductivity between the native soil and the soils that were physically affected by normal leach field operation. The presence of the leach field piping was assumed within the leach field as identified by the geophysical survey which allowed for representative soil and groundwater sample collection. Underground utility locations were delineated to guide the soil boring placement. Geophysical findings are shown on Figure 3-1. The complete geophysical report is included in Appendix B.

3.3 Soil Investigation

The soil investigation of the removed septic tank at Building 1166 was conducted on July 2, 2012. The program consisted of sampling four borings advanced at the removed septic tank location, as shown on Figure 3-1. Soil boring OT-C542-Station 1 (sample numbers OTC542-IS-0001-070212, OTC542-IS-0002-070212-FD, and OTC542-IS-0003-070212) was placed northwest of the removed septic tank along the influent line. Both OT-C542-Station 2

(sample numbers OTC542-IS-0004-070212 and OTC542-IS-0005-070212) and OT-C542-Station 3 (sample numbers OTC542-IS-0006-070212 and OTC542-IS-0007-070212) are located adjacent to the removed septic tank. OT-C542-Station 2 was placed on the western side of the removed septic tanks and OT-C542-Station 3 was placed northeast of the removed septic tank near the effluent line. Location OT-C542-Station 4 (sample numbers OTC542-IS-0008-070212, OTC542-IS-0009-070212, OTC542-IS-0010-070212, and OTC542-IS-0011-070212) was placed in the leach field of the removed septic tank. All borings were advanced using direct push technology (DPT), with soil samples collected at depths of 3 to 5 ft and 10 to 12 ft at OT-C542-Station 1; and 7 to 9 ft and 14 to 16 ft at OT-C542-Station 2; 3 to 5 ft and 10 to 12 ft at OT-C542-Station 3; and 0 to 2, 3 to 5 ft, 10 to 12, and 23 to 25 ft at OT-C542-Station 4 (Appendix C has copies of the sample collection logs). A field duplicate was collected from the 3 to 5 ft depth at OT-C542-Station 1.

Soil samples were logged in the field in accordance with the Unified Soil Classification System requirements, and sample depths were in general accordance with the *RFI Work Plan* (USACE, 2010). Soil samples were not screened with a photoionization detector since there was no sensory evidence of contamination. Appendix D has copies of the soil boring logs.

Soil samples for volatile organic compound (VOC) analysis were collected in accordance with EPA Method 5035, using a TerraCore® Sampler device (EPA, 1986), while non-VOC sample aliquots were placed in laboratory-provided containers. Samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), explosives, polychlorinated biphenyls (PCBs), target analyte list (TAL) metals, total petroleum hydrocarbons (TPH)-gasoline range organics (GRO), TPH-diesel range organics (DRO), TPH-oil range organics (ORO), total cyanide, percent solids, and tritium by Accutest Laboratories, Inc., a National Environmental Laboratory Accreditation Program-accredited laboratory, using EPA analytical methods, as summarized on Table 3-1.

The excess sample core soil extracted using the DPT drilling method was placed in 55-gallon drums for later characterization and transport to a licensed disposal facility. The boreholes were abandoned upon completion by plugging from the bottom of the borehole to ground surface using bentonite pellets, then patched with cement to match the surrounding land surface contour. The soil borings were then covered with gravel to match the surrounding land surface contour. Soil boring equipment was decontaminated between borings as detailed in Holloman AFB Standard Operating Procedure 2, “Sampling Equipment Decontamination” (Appendix B of the *RFI Work Plan* [USACE, 2010]) and Shaw’s Standard Operating Procedure No. EI-FS-014, “Decontamination of Contact Sampling Equipment.”

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3.4 Groundwater Investigation

One monitoring well was installed at the Building 1166 to determine any impacts to groundwater. Well OTC542-MW01 was installed in the leach field, approximately 40 ft northeast of the removed septic tank location, as shown on Figure 3-1.

The monitoring well was installed using hollow-stem auger drilling techniques in accordance with NMED Ground Water Quality Bureau *Monitoring Well Construction and Abandonment Guidelines* (NMED, 2011). The 10-inch borehole was advanced approximately 3 ft into the water table at approximately 24 ft bgs, and completed such that the top of the well screen was set above the approximate level of the groundwater observed during drilling. The monitoring well was constructed of 2-inch-diameter Schedule 40 polyvinyl chloride riser with 2-inch diameter, polyvinyl chloride screen fitted with pre-packed, very fine stainless-steel mesh (Appendix E). The screened section of the well was 5 ft long (as opposed to the stipulated 10 ft in the *RFI Work Plan* (USACE, 2010); the variance is based on observed lithology). A silica sand filter pack was placed around the screen to approximately 2 ft above the top of the screen, with a 2-ft thick bentonite seal placed above the filter pack. The remaining annular space was grouted with cement and bentonite.

The monitoring well was constructed as a "flush-mount" surface completion with a water-tight well vault, locking, expandable well plug, and finished to surrounding grade. Table 3-2 and Appendix E (well construction diagram) provide monitoring well construction details.

The newly-installed monitoring well was developed to create an effective filter pack around the well screen, remove fine particles from the formation near the borehole, and assist in restoring the natural water quality of the aquifer in the vicinity of the well. Development occurred six days after installation to allow for grout curing. Surging and pumping were both employed to achieve the most effective well development.

Information recorded during well development included water-level measurements, depth-to-bottom measurements, water-quality parameters (pH, temperature, and specific conductance), discharge-water color, water volume, and time period. The goal of well development was to meet the following criteria:

- Water removed from the well was visually clear, and the turbidity measures were less than or equal to 10 nephelometric turbidity units. Note that in the case where the criterion could not be met, development was continued until water quality parameters stabilized.
- The pH, temperature, and specific conductance parameters were stabilized (generally less than 10 percent variation for three successive readings).

Groundwater sampling was conducted at OTC542-MW01 on August 24, 2012 using low-flow sampling techniques. Water quality indicator parameters were measured and recorded during purging of the monitoring wells (Appendix F) using a field-calibrated water quality meter. Table 3-3 contains final water quality readings from the sampling event. Groundwater samples were collected once indicator parameters had stabilized, and analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, total cyanide, and tritium also by Accutest Laboratories, Inc.

The direction of groundwater flow at Holloman AFB has been shown to be generally from northeast to southwest as depicted in Figure 2-3. From the Corrective Measures Completion Report by Bhate Associates (2007), groundwater flow direction at Building 1166 was to the southeast as indicated in Figure 3-1.

3.5 Investigation-Derived Waste

The nonhazardous IDW that were generated during the Building 1166 RFI were segregated into the following categories:

- Soil – drill cuttings soil
- Water – decontamination liquids and purge water.

Upon generation, IDW was properly containerized and temporarily stored at the designated laydown yard, as specified by Holloman AFB. Wastes were contained in sealed, U.S. Department of Transportation-approved, steel 55-gallon drums (for soil cuttings and decontamination water), roll-off containers with liners and covers (for excavated waste soil), and a 1,400-gallon plastic tank (for wastewater). The waste soil drums were emptied into 20 cubic yard roll-off containers, and the wastewater was pumped into a bulk plastic tank prior to characterization sampling and analysis for disposal. The drill cuttings from the Building 1166 Site were placed into the 20-cubic yard roll-off containers along with soils from other Holloman AFB investigation sites.

3.6 Site Surveying

Soil boring and monitoring well locations, along with the septic tank location and associated site features shown on Figure 3-1, were surveyed by Albuquerque Surveying Company, Inc. from Albuquerque, New Mexico, a state-licensed surveyor.

Horizontal coordinates are referenced to the North American Datum 1983 State Plane Coordinate System, New Mexico-Central, and surveyed to an accuracy of $\pm$1.0 ft. Vertical elevations are referenced to the North American Vertical Datum 1988 coordinate system to an accuracy of $\pm$0.01 ft. A copy of the survey results is presented in Appendix G.

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3.7 Decontamination Procedures

A decontamination pad was constructed at the designated laydown area for decontamination of all downhole drilling equipment. The drilling rig was decontaminated prior to entering the site. Drilling equipment that came into contact with the borehole was decontaminated by hot-water pressure washing. Disposable equipment used for soil sample collection did not require decontamination.

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4.0 INVESTIGATION RESULTS AND EVALUATION

Soil analytical results presented in this section were used to delineate constituents of concern that may have been released to the environment, and confirm that no additional remedial measures are required.

4.1 Soil Analytical Results

DPT soil boring samples and post-excavation confirmation samples were collected during the Building 1166 RFI, at the locations shown on Figure 3-1. All soil samples were sent to Accutest Laboratories, Inc., for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, total cyanide, percent solids, and tritium analyses. Analytical results for the soil samples are presented in Table 4-1. Laboratory analytical data packages, and the data validation checklists for the soil sample data are provided in Appendix H.

The analytical results for metals in Table 4-1 show that Holloman AFB soil samples contain significant amounts of calcium, typically greater than 100,000 milligrams per kilogram (mg/kg) (10 percent), and can be as high as 250,000 mg/kg (25 percent). Calcium at these levels contributes spectral interferences during inductively-coupled plasma metals analysis, and can also clog the nebulizer that is used to introduce the sample. Sample dilution is the recommended method for solving both the spectral interference issue and the nebulizer clogging issue. However, sample dilution raises the analytical method detection limits (MDL) for all associated metals, including thallium.

A typical method detection limit for thallium during inductively-coupled plasma analysis is 0.13 mg/kg. Diluting by a factor of 5 to 20 to eliminate calcium spectral interference and nebulizer clogging causes the thallium detection limit to be elevated by a factor of 5 to 20. This results in a MDL that is above the NMED residential SSL of 0.782 mg/kg thallium. Consequently, the required remedy to allow for proper equipment operation resulted in MDLs that were above the NMED residential SSL. However, thallium is not an element that is anticipated to be present at Building 1166 as a result of normal septic tank operation and maintenance.

The validated soil analytical results were compared with the NMED residential SSLs (NMED, 2012a), or the EPA residential RSLs (EPA, 2012a), if NMED residential SSLs have not been established for a given analyte. In addition, a TPH screening level of 1,000 mg/kg was used to evaluate the laboratory analytical data. The 1,000 mg/kg action level for petroleum-contaminated soil is the Residential Direct Exposure Limit for unknown oil, listed in Table 6-2, TPH Screening Guidelines for Potable Groundwater, of the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a).

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No parameters had detections above the NMED residential SSLs in any of the soil samples collected at Building 1166. Likewise, all soil samples from all locations and depths had TPH-GRO, TPH-DRO, and TPH-ORO concentrations below the TPH screening level. Tritium was not detected in any soil samples.

Sample OTC542-IS-0006-070212, collected from OT-C542 Station 3 in the 3 to 5 ft bgs interval, had a mercury concentration (0.015 mg/kg) above the Holloman soil background value of 0.0108 mg/kg. All other parameters were below the Holloman AFB background values.

4.2 Groundwater Analytical Results

One monitoring well was installed during the removed septic tank investigation, as shown on Figure 3-1: OTC542-MW01. Groundwater from the well was analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, total cyanide, and tritium by Accutest Laboratories, Inc. Detections were compared to the NMWQCC WQS and EPA drinking water MCLs. The Building 1166 groundwater sample had a TDS value of 10,800 mg/L.

Analytical results for the Building 1166 groundwater samples are shown in Table 4-2. The following metals had detection above the appropriate criteria or background values as indicated:

- Manganese (233 micrograms per liter [µg/L]) exceeded the NMWQCC WQS (200 µg/L) and exceeded the Holloman AFB unfiltered background concentration 50 µg/L)
- Antimony (8.3 µg/L) exceeded the EPA MCL (6 µg/L) and exceeded the Holloman AFB unfiltered background concentration (6 µg/L)
- Copper (13.3 µg/L) exceeded the Holloman AFB unfiltered groundwater background value (9.8 µg/L), but was below the NMWQCC WQS and the EPA drinking water MCL.

All other analytical parameter concentrations were below the NMWQCC WQS and the EPA drinking water MCLs.

4.3 Investigation-Derived Waste Analytical Results

Waste characterization samples were collected from the bulk waste soil for analysis of Toxicity Characteristic Leaching Procedure VOCs, SVOCs, and RCRA metals. The results are presented in Table 4-3. The results of the waste soil analysis returned no concentrations

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above 40 Code of Federal Regulations Part 261.24 limits. The waste soil could be managed as nonhazardous waste and was subsequently transported to Otero/Greentree Regional Landfill, Alamogordo, New Mexico for disposal (Waste Manifest in Appendix I). The waste water from equipment decontamination was sampled and analyzed for VOCs, SVOCs, TAL metals, TPH-GRO, TPH-DRO, and TPH-ORO, with the analytical results presented in Table 4-4. The analytical results were reviewed by the Holloman AFB waste water treatment plant personnel, and subsequently accepted for disposal.

4.4 Risk-Based Evaluation

4.4.1 Soil

Eleven soil samples were collected at Building 1166, from depths of 0 to 22 ft bgs, during the former septic tank investigation. Per NMED (2012a), the soil depths of interest for a risk evaluation are 0 to 10 ft bgs for construction workers and residential receptors, and 0 to 1 ft bgs for commercial/industrial workers. Therefore, data results from 0 to 10 ft bgs interval (Table 4-1) were used for this risk valuation. Based on the initial results of the screening evaluation, no constituents of potential concern (COPC) have a concentration greater than NMED residential SSLs values (or EPA residential RSLs, if an NMED SSL has not been established) or the Holloman AFB background soil values. Total cancer risk ratios and total hazard ratios (hazard index [HI]) to address potential additive toxicological effects were also assessed (per NMED 2012a, Section 5.0). This was conducted by using maximum detected concentrations of carcinogens and non-carcinogens, estimating risk and hazard ratios, and scaling a total cancer risk and total HI. The total cancer risk did not exceed 1.0×10^{-5} (total cancer risk: 7.7×10^{-6}), as shown in Appendix J. The total HI based on maximum detected concentrations was equal to 0.41 (Appendix J). As the target HI is 1.0, this is acceptable because the HI does not exceed 1.0.

Because no COPCs in soil were selected, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure are not health risks.

4.4.2 Groundwater

One groundwater sample was collected from monitoring well OTC542-MW01 on August 24, 2012. Based on the data results in Table 4-2, two chemicals have concentrations greater than NMWQCC WQS or the EPA drinking water MCLs. Based on screening, the following two COPCs were identified in groundwater:

- Antimony
- Manganese.

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Per the *RFI Work Plan* (USACE, 2010), for groundwater COPCs that exceed the screening values, an exposure model is required, including the following:

- Media of concern
- Current and future receptors
- Complete and incomplete exposure pathways.

The media of concern is groundwater, and future receptors could include commercial/industrial workers, construction workers, and residents. As current shallow groundwater is not used as a drinking water supply, direct exposure pathways for current receptors are all incomplete, except for potential vapor intrusion concerns for existing occupied buildings located above VOC groundwater plumes. However, as no VOCs were selected as COPCs in groundwater, the vapor intrusion pathway is not considered further. Complete exposure pathways for future receptors include ingestion of COPCs in groundwater, dermal contact with COPCs in groundwater, and inhalation of volatile chemicals in groundwater that have volatilized as a result of the normal household use of groundwater as a drinking water supply. However, as VOCs were not selected, the inhalation pathway does not apply to Building 1166 (OT-C542) COPCs. Construction worker exposure to COPCs in groundwater during intrusive work at Building 1166 is considered an incomplete pathway, given that the depth to groundwater is approximately 24 ft bgs. In addition, exposure of COPCs to commercial/industrial workers is also considered incomplete.

Per the *RFI Work Plan* (USACE, 2010), site-specific screening levels may be developed for all complete routes of exposure identified in the exposure model. Therefore, site-specific groundwater direct exposure screening levels are only developed for future residents, for the identified site-related COPCs with available chemical-specific toxicity parameters (antimony and manganese). EPA's on-line RSL tool was used to estimate the site-specific groundwater screening levels for antimony and manganese, relying on NMED-recommended default exposure parameters and toxicity values, when available.

Site-specific screening levels for antimony and manganese are listed as follows, with output from EPA's on-line calculator tool presented in Appendix J:

- Site-specific screening level for antimony in tap water: 5.99 µg/L
- Site-specific screening level for manganese in tap water: 322 µg/L.

Per the *RFI Work Plan* (USACE, 2010), representative site-specific exposure point concentrations (EPCs) should be compared with the site-specific screening levels previously determined. These EPCs, based on 95 percent upper confidence limit (UCL) of the mean, were attempted to be estimated using EPA's ProUCL statistical software, version 4.1.01

(EPA, 2010). In the event that ProUCL could not calculate EPCs (e.g., too few samples or infrequently detected samples), derivation for the two COPCs would come from using a bootstrap-t statistical program, described by Efron (1982) and discussed in EPA (1997). Non-detect values, if present, would be represented in this bootstrap-t program as random numbers between zero and the detection limit that were generated by the iterative process written into the program.

However, as only one groundwater analytical result was available for each COPC, neither of the aforementioned statistical analyses was possible. Therefore, the detected concentration was determined to be the maximum detected concentration (MDC), which was selected as the EPC.

- Antimony EPC (MDC): 8.3 µg/L
- Manganese EPC (MDC): 233 µg/L.

The antimony EPC exceeds the site-specific tap water screening level of 5.99 µg/L for antimony, but the manganese EPC does not exceed the manganese screening level of 322 µg/L.

The majority (over 70 percent) of the Environmental Restoration Program sites located across Holloman AFB have groundwater monitoring wells containing water with an average TDS concentration greater than 10,000 mg/L, including Building 1166 (10,800 mg/L). TDS concentrations greater than 10,000 mg/L exceed the NMWQCC limit as potable water and thus, the groundwater beneath Building 1166 Holloman AFB has been designated as unfit for human consumption. Likewise, the EPA guidelines have identified the groundwater as a Class IIIB water source, which is characterized by TDS concentrations in excess of 10,000 mg/L and with a low degree of interconnection with adjacent surface water or groundwater of a higher class; therefore, the groundwater is not a drinking water source. Groundwater does not discharge or connect to any adjacent aquifers because the Tularosa Basin is a closed basin. Adjacent surface waters include Lost River and Lake Holloman, which also have high concentrations of TDS, and are not considered potential drinking water sources.

Although future tap water exposure may be considered a potential health concern for antimony (but not for manganese), antimony in groundwater is not a concern because the aquifer under Building 1166 (OT-C542) is not suitable for human consumption.

4.4.3 Risk-Based Conclusions

No COPCs were selected in soil; therefore, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure

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are not health risks. Additionally, total cancer risks and non-cancer hazards in soil were acceptable. For the two COPCs selected in groundwater (antimony and manganese), future tap water exposure is not a health concern since the groundwater is not suitable for human consumption.

4.5 Ecological Evaluation

The site of the former septic tank at Building 1166 is in a flat-lying, graveled area in the rear of the building that abuts the building's parking lot and serves as additional parking for the nearby support buildings. A screening-level ecological risk assessment (SLERA) Scoping Assessment Site Assessment Checklist was completed for the Building 1166 (OT-C542) septic tank system and is included in Appendix K. Results of the checklist Exclusion Criteria Decision Tree indicate that the site is a potential viable ecological habitat and a potential exposure pathway exists for soil; therefore, the SLERA was completed.

Soil data results from 0 to 10 ft bgs were included in the comparison and are provided in Appendix K (Table A). According to NMED (2012c), this is the potential depth of interest for wildlife, including burrowing animals. As shown on Table A of Appendix K, six soil samples were available within the 0 to 10 ft bgs zone. Detected constituents in soil included 17 metals, one VOC, seven SVOCs (all polycyclic aromatic hydrocarbons [PAHs]), and one PCB (Aroclor-1254). All other constituents analyzed for were non-detected.

Metals concentrations were compared to Holloman soil background values (Table A, Appendix K). Sample OTC542-IS-0006-070212, collected from OT-C542 Station 3 in the 3 to 5 ft bgs interval, had a mercury concentration (0.015 mg/kg) above the Holloman soil background value of 0.0108 mg/kg. No other detected concentrations of metals in the soil samples evaluated exceeded Holloman soil background values. Therefore, no further evaluation was performed for metals.

Detected concentrations of acetone, the seven PAHs, and the PCB Aroclor-1254 in soil data collected at the site were compared to the lowest available ecological screening levels (ESL) presented in the Los Alamos National Laboratory (LANL) Eco Risk Database version 3.1 (LANL, 2012). The LANL database provides both No-Effect ESLs and Low-Effect ESLs for soil, and both values are provided in Table A of Appendix K. The three detected acetone concentrations, the PAH detected concentrations, and the single PCB Aroclor-1254 concentration were below their respective LANL ESLs, indicating that ecological impacts are not likely to occur from these constituents. Since all detected site concentrations are either below their respective background screening values (metals only), or below their respective LANL ESLs, it is concluded that risks to the ecological system at and surrounding the site are generally acceptable.

5.0 DATA QUALITY ASSURANCE AND DATA QUALITY CONTROL REVIEW

All analytical data was reviewed in accordance with EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA, 2004a) and the EPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (EPA, 2004b). Data qualifiers were added to the database prior to project use. The data tables provided in Section 4.0 show the data qualifiers added during data validation. Detailed data validation checklists for each data deliverable are provided in Appendix H.

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6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary and Conclusions

6.1.1 Soil

Eleven soil samples were collected at various Holloman AFB Building 1166 locations during the removed septic tank investigation. The samples were analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, total cyanide, percent solids, and tritium. Validated analytical results were compared with the NMED residential SSLs (or with the EPA RSLs when an NMED SSL has not been established), the NMED Residential Direct Exposure Limit for soil contaminated with unknown petroleum oil, and with the Holloman AFB background values. No samples from the 0.0 to 10.0 ft bgs zone had constituent concentrations that exceeded the NMED residential SSLs. Sample OTC542-IS-0006-070212, collected from OT-C542 Station 3 in the 3 to 5 ft bgs interval, had a mercury concentration (0.015 mg/kg) above the Holloman soil background value of 0.0108 mg/kg. However, no other detected concentrations of metals in the soil samples evaluated exceeded Holloman soil background values. No TPH was detected above 1,000 mg/kg in any of the soil samples from any depth or location.

Risk-based health screening was not performed since there were no COPCs identified in soil. The ecological evaluation concluded that risks to the ecological system at and surrounding the site are generally acceptable.

6.1.2 Groundwater

One groundwater sample was collected from monitoring well OTC542-MW01 on August 24, 2012. Antimony and manganese had concentrations greater than NMWQCC WQS or the EPA drinking water MCLs. An exposure model was developed for complete exposure pathways (future residents only), which included the calculation of site-specific screening levels for antimony and manganese. Comparison of the OTC542-MW01 detections with the site-specific screening levels showed that antimony exceeded the screening level, but manganese did not exceed the screening level. NMED and EPA both classify the groundwater beneath Building 1166 as not suitable for human consumption, based on TDS levels exceeding 10,000 mg/L. Therefore, future tap water exposure is not a health concern.

6.2 Recommendations

6.2.1 Soil

No COPCs were detected in soil above the NMED residential SSLs and no unacceptable ecological risk was identified for the site and its surroundings; therefore, no additional corrective action is recommended for soil at Building 1166.

6.2.2 Groundwater

Antimony and manganese concentrations in groundwater at Building 1166 exceeded the NMWQCC WQS or the EPA drinking water MCLs. The groundwater beneath Building 1166 is not suitable for human consumption, based on TDS levels exceeding 10,000 mg/L. Therefore, future tap water exposure is not a health concern and no additional corrective action is recommended for groundwater at Building 1166.

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Tables

Table 3-1
Sample Summary
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C542-Station1	686092.9841	1672400.3126	7/2/2012	Investigation Soil	3 - 5	OTC542-IS-0001-070212	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/2/2012	Investigation Soil - Field Duplicate	3 - 5	OTC542-IS-0002-070212-FD	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/2/2012	Investigation Soil	10 - 12	OTC542-IS-0003-070212	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OT-C542-Station2	686076.3760	1672406.6948	7/2/2012	Investigation Soil	7 - 9	OTC542-IS-0004-070212	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C542-Station2	686076.3760	1672406.6948	7/2/2012	Investigation Soil	14 - 16	OTC542-IS-0005-070212	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OT-C542-Station3	686082.6401	1672419.7910	7/2/2012	Investigation Soil	3 - 5	OTC542-IS-0006-070212	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/2/2012	Investigation Soil	10 - 12	OTC542-IS-0007-070212	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OTC542-MW01 (OT-C542-Station4)	686101.3307	1672448.2037	7/2/2012	Investigation Soil	3 - 5	OTC542-IS-0008-070212	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OTC542-MW01 (OT-C542-Station4)	686101.3307	1672448.2037	7/2/2012	Investigation Soil	10 - 12	OTC542-IS-0009-070212	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/2/2012	Investigation Soil	0 - 2	OTC542-IS-0010-070212	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/2/2012	Investigation Soil	23 - 25	OTC542-IS-0011-070212	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			8/24/2012	Groundwater	NA	OTC542-GW-0001-082412	TDS	SM2540C
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7470
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

[a] Coordinates are referenced to the North American Datum, 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] *EPA, 2007, Test Methods for Evaluating Soil Waste Physical/Chemical Methods, EPA Publication SW-846, Final Update IV. Available online at www.epa.gov/osw/hazard/testmethods/sw846.*

Percent Solids and Total Dissolved Solids from Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

DRO = diesel range organics
EPA = U.S. Environmental Protection Agency
FD = field duplicate
ft bgs = below ground surface
GRO = gasoline range organics
GW = groundwater
IS = investigation soil
MW = monitoring well
NA = not applicable
ORO = oil range organics
PCB = polychlorinated biphenyl
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
SVOC = semivolatile organic compound
TAL = target analyte list
TDS = total d Total Dissolved Solids
TPH = total petroleum hydrocarbons
VOC = volatile organic compound

Table 3-2
Monitoring Well Construction Details and Groundwater Elevation Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Well ID	Monitoring Well Construction Details						Groundwater Elevation Data: 8/24/2012		
	Location Coordinates		Installation Date	Well Diameter (in)	Well Depth at Construction (ft bgs)	Screened Interval (ft bgs)	Top of PVC Riser Pipe Elevation[b] (ft amsl)	Depth to Water (ft below top of PVC riser pipe)	Potentiometric Surface Elevation[b] (ft amsl)
	Grid Northing[a]	Grid Easting[a]							
OTC542-MW01	686101.3307	1672448.2037	7/2/2012	2.0	30.0	25.0-30.0	4060.98	24.40	4036.58

[a] Location coordinates are referenced to the North American Datum, 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] Elevations are referenced to the North American Vertical Datum of 1988 (NAVD 88).

ft = feet
amsl = above mean sea level
ft bgs = feet below ground surface
ID = identification
in = inches
PVC = polyvinyl chloride
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation

Table 3-3
Monitoring Well Purge Water Quality Parameters
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Well ID	Sample Date	Depth to Water (ft below top of PVC riser pipe)	Total Depth (ft below top of PVC riser pipe)	Purge Water Volume (gallons)	Temperature (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	TDS (g/L)
OTC542-MW01	8/24/2012	24.40	28.98	3.75	23.85	7.50	14.73	7.0	4.55	120.5	9.53

°C = degrees Celsius
DO = dissolved oxygen
ft = feet
g/L = grams per liter
ID = identification
mg/L = milligrams per liter
mS/cm = millisiemens per centimeter
mV = millivolts
NTU = Nephelometric Turbidity Unit
ORP = oxidation-reduction potential
PVC = polyvinyl chloride
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
TDS = total dissolved solids

Table 4-1
Soil Analytical Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC542-IS-0001-070212		OTC542-IS-0002-070212-FD		OTC542-IS-0003-070212		OTC542-IS-0004-070212		OTC542-IS-0005-070212		OTC542-IS-0006-070212		OTC542-IS-0007-070212		OTC542-IS-0008-070212		OTC542-IS-0009-070212		OTC542-IS-0010-070212		OTC542-IS-0011-070212	
				Sample Date	7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012	
				Location	Station 1, septic tank influent						Station 2, septic tank				Station 3, septic tank effluent				Station 4, septic tank leach field							
				Depth (ft bgs)	3 - 5		3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		23 - 25	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**81.4**		**84**		**71.4**		**88.7**		**86.6**		**85.5**		**86.8**		**83.9**		**86.9**		**82.5**		**84.4**	
VOLATILES (mg/kg)																										
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0011	U	0.001	U	0.0015	U	0.00098	U	0.001	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0013	U	0.00087	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0012	U	0.0011	U	0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0012	U	0.0014	U	0.00095	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0017	U	0.0016	U	0.0024	U	0.0015	U	0.0016	U	0.0017	U	0.0017	U	0.0016	U	0.0017	U	0.002	U	0.0014	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0011	U	0.001	U	0.0015	U	0.00098	U	0.001	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0013	U	0.00087	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0011	U	0.001	U	0.0015	U	0.00098	U	0.001	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0013	U	0.00087	U
1,1-DICHLOROETHENE	NE	240	449		0.0014	U	0.0013	U	0.0019	U	0.0012	U	0.0013	U	0.0014	U	0.0014	U	0.0014	U	0.0014	U	0.0016	U	0.0011	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0012	UJ	0.0011	U	0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0012	U	0.0014	U	0.00095	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0024	U	0.0021	U	0.0032	U	0.002	U	0.0022	U	0.0023	U	0.0024	U	0.0022	U	0.0023	U	0.0027	U	0.0018	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.001	U	0.00092	U	0.0014	U	0.00089	U	0.00094	U	0.001	U	0.001	U	0.00096	U	0.001	U	0.0012	U	0.0008	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0011	U	0.001	U	0.0015	U	0.00098	U	0.001	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0013	U	0.00087	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.001	U	0.00092	U	0.0014	U	0.00089	U	0.00094	U	0.001	U	0.001	U	0.00096	U	0.001	U	0.0012	U	0.0008	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0012	U	0.0011	U	0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0012	U	0.0014	U	0.00095	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0012	U	0.0011	U	0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0012	U	0.0014	U	0.00095	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0011	U	0.001	U	0.0015	U	0.00098	U	0.001	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0013	U	0.00087	U
2-HEXANONE	NE	210	NE		0.0055	U	0.005	U	0.0075	U	0.0048	U	0.0051	U	0.0055	U	0.0055	U	0.0052	U	0.0055	U	0.0063	U	0.0043	U
ACETONE	NE	61000	66600		**0.107**		**0.0822**		0.028	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.02	U	**0.135**		0.016	U
BENZENE	NE	1.1	15.4		0.0015	U	0.0014	U	0.0021	U	0.0013	U	0.0014	U	0.0015	U	0.0015	U	0.0014	U	0.0015	U	0.0017	U	0.0012	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0011	U	0.001	U	0.0015	U	0.00098	U	0.001	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0013	U	0.00087	U
BROMOFORM	NE	62	616		0.0015	U	0.0014	U	0.0021	U	0.0013	U	0.0014	U	0.0015	U	0.0015	U	0.0014	U	0.0015	U	0.0017	U	0.0012	U
BROMOMETHANE	NE	7.3	16.5		0.0021	U	0.0018	U	0.0028	U	0.0018	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.002	U	0.0023	U	0.0016	U
CARBON DISULFIDE	NE	820	1530		0.0021	U	0.0018	U	0.0028	U	0.0018	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.002	U	0.0023	U	0.0016	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0018	U	0.0017	U	0.0025	U	0.0016	U	0.0017	U	0.0018	U	0.0018	U	0.0017	U	0.0018	U	0.0021	U	0.0014	U
CHLOROBENZENE	NE	290	376		0.001	U	0.00092	U	0.0014	U	0.00089	U	0.00094	U	0.001	U	0.001	U	0.00096	U	0.001	U	0.0012	U	0.0008	U
CHLOROETHANE	NE	15000	29800		0.0021	U	0.0018	U	0.0028	U	0.0018	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.002	U	0.0023	U	0.0016	U
CHLOROFORM	NE	0.29	5.86		0.0012	U	0.0011	U	0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0012	U	0.0014	U	0.00095	U
CHLOROMETHANE	NE	120	275		0.0021	U	0.0018	U	0.0028	U	0.0018	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.002	U	0.0023	U	0.0016	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0015	U	0.0014	U	0.0021	U	0.0013	U	0.0014	U	0.0015	U	0.0015	U	0.0014	U	0.0015	U	0.0017	U	0.0012	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.001	U	0.00092	U	0.0014	U	0.00089	U	0.00094	U	0.001	U	0.001	U	0.00096	U	0.001	U	0.0012	U	0.0008	U
CYCLOHEXANE	NE	7000	NE		0.0014	U	0.0013	U	0.0019	U	0.0012	U	0.0013	U	0.0014	U	0.0014	U	0.0014	U	0.0014	U	0.0016	U	0.0011	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.001	U	0.00092	U	0.0014	U	0.00089	U	0.00094	U	0.001	U	0.001	U	0.00096	U	0.001	U	0.0012	U	0.0008	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0015	U	0.0014	U	0.0021	U	0.0013	U	0.0014	U	0.0015	U	0.0015	U	0.0014	U	0.0015	U	0.0017	U	0.0012	U
ETHYLBENZENE	NE	5.4	68.4		0.001	U	0.00092	U	0.0014	U	0.00089	U	0.00094	U	0.001	U	0.001	U	0.00096	U	0.001	U	0.0012	U	0.0008	U
ISOPROPYLBENZENE	NE	2100	2430		0.0011	U	0.001	U	0.0015	U	0.00098	U	0.001	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0013	U	0.00087	U
METHYL ACETATE	NE	78000	78200		0.013	U	0.012	U	0.017	U	0.011	U	0.012	U	0.013	U	0.013	U	0.012	U	0.013	U	0.015	U	0.0099	U
METHYL ETHYL KETONE	NE	28000	37100		0.0063	U	0.0056	U	0.0085	U	0.0054	U	0.0057	U	0.0062	U	0.0062	U	0.0059	U	0.0062	U	0.0071	U	0.0049	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0056	U	0.0051	U	0.0077	U	0.0049	U	0.0052	U	0.0056	U	0.0056	U	0.0053	U	0.0056	U	0.0064	U	0.0044	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0013	U	0.0012	U	0.0018	U	0.0012	U	0.0012	U	0.0013	U	0.0013	U	0.0013	U	0.0013	U	0.0015	U	0.001	U
METHYLENE CHLORIDE		56	409		0.0047	U	0.0043	U	0.0064	U	0.0041	U	0.0043	U	0.0047	U	0.0047	U	0.0044	U	0.0047	U	0.0054	U	0.0037	U

Table 4-1
Soil Analytical Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC542-IS-0001-070212		OTC542-IS-0002-070212-FD		OTC542-IS-0003-070212		OTC542-IS-0004-070212		OTC542-IS-0005-070212		OTC542-IS-0006-070212		OTC542-IS-0007-070212		OTC542-IS-0008-070212		OTC542-IS-0009-070212		OTC542-IS-0010-070212		OTC542-IS-0011-070212	
				Sample Date	7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012	
				Location	Station 1, septic tank influent						Station 2, septic tank				Station 3, septic tank effluent				Station 4, septic tank leach field							
				Depth (ft bgs)	3 - 5		3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		23 - 25	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																										
STYRENE	NE	6300	7280		0.0027	U	0.0024	U	0.0036	U	0.0023	U	0.0024	U	0.0026	U	0.0027	U	0.0025	U	0.0026	U	0.003	U	0.0021	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0021	U	0.0018	U	0.0028	U	0.0018	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.002	U	0.0023	U	0.0016	U
TETRACHLOROETHYLENE	NE	22	7.02		0.001	U	0.00092	U	0.0014	U	0.00089	U	0.00094	U	0.001	U	0.001	U	0.00096	U	0.001	U	0.0012	U	0.0008	U
TOLUENE	NE	5000	5270		0.0012	U	0.0011	U	0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0012	U	0.0014	U	0.00095	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0015	U	0.0014	U	0.0021	U	0.0013	U	0.0014	U	0.0015	U	0.0015	U	0.0014	U	0.0015	U	0.0017	U	0.0012	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0011	U	0.001	U	0.0015	U	0.00098	U	0.001	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0013	U	0.00087	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0012	U	0.0011	U	0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0012	U	0.0014	U	0.00095	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0021	U	0.0018	U	0.0028	U	0.0018	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.002	U	0.0023	U	0.0016	U
VINYL CHLORIDE	NE	0.06	0.728		0.0015	U	0.0014	U	0.0021	U	0.0013	U	0.0014	U	0.0015	U	0.0015	U	0.0014	U	0.0015	U	0.0017	U	0.0012	U
XYLENES, TOTAL	NE	630	814		0.0033	U	0.003	U	0.0045	U	0.0028	U	0.003	U	0.0032	U	0.0033	U	0.0031	U	0.0032	U	0.0037	U	0.0025	U
SEMIVOLATILES (mg/kg)																										
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
2,4-DICHLOROPHENOL	NE	180	183		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.026	U	0.025	U	0.029	U	0.024	U	0.024	U	0.024	U	0.024	U	0.025	U	0.024	U	0.025	U	0.024	U
2,4-DINITROPHENOL	NE	120	122		0.42	U	0.39	U	0.46	U	0.37	U	0.38	U	0.38	U	0.38	U	0.39	U	0.38	U	0.4	U	0.39	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
2,6-DINITROTOLUENE	NE	61	61.1		0.025	U	0.023	U	0.027	U	0.022	U	0.023	U	0.023	U	0.022	U	0.023	U	0.022	U	0.024	U	0.023	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
2-CHLOROPHENOL	NE	390	391		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
2-METHYLNAPHTHALENE	NE	230	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
2-METHYLPHENOL	NE	3100	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
2-NITROANILINE	NE	610	NE		0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
2-NITROPHENOL	NE	NE	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
3-NITROANILINE	NE	NE	NE		0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.083	U	0.079	U	0.092	U	0.075	U	0.076	U	0.077	U	0.076	U	0.079	U	0.075	U	0.081	U	0.078	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
4-CHLOROANILINE	NE	2.4	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
4-NITROANILINE	NE	24	NE		0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
4-NITROPHENOL	NE	NE	NE		0.17	U	0.16	U	0.18	U	0.15	U	0.15	U	0.15	U	0.15	U	0.16	U	0.15	U	0.16	U	0.16	U
ACENAPHTHENE	NE	3400	3440		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
ACENAPHTHYLENE	NE	NE	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
ACETOPHENONE	NE	7800	7820		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
ANTHRACENE	NE	17000	17200		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
ATRAZINE	NE	2.1	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U

Table 4-1
Soil Analytical Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC542-IS-0001-070212		OTC542-IS-0002-070212-FD		OTC542-IS-0003-070212		OTC542-IS-0004-070212		OTC542-IS-0005-070212		OTC542-IS-0006-070212		OTC542-IS-0007-070212		OTC542-IS-0008-070212		OTC542-IS-0009-070212		OTC542-IS-0010-070212		OTC542-IS-0011-070212	
				Sample Date	7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012	
				Location	Station 1, septic tank influent						Station 2, septic tank				Station 3, septic tank effluent				Station 4, septic tank leach field							
				Depth (ft bgs)	3 - 5		3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		23 - 25	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																										
BENZALDEHYDE	NE	7800	NE	0.21	U	0.2	U	0.23	U	0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U	0.19	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	**0.032**	J	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
BENZO(A)PYRENE	NE	0.015	0.148	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	**0.0269**	J	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	**0.0308**	J	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	**0.0286**	J	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
BIPHENYL	NE	51	57.1	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.083	U	0.079	U	0.092	U	0.075	U	0.076	U	0.077	U	0.076	U	0.079	U	0.075	U	0.081	U	0.078	U
CAPROLACTAM	NE	31000	NE	0.067	U	0.063	U	0.074	U	0.06	U	0.061	U	0.061	U	0.061	U	0.063	U	0.06	U	0.064	U	0.062	U
CARBAZOLE	NE	NE	NE	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
CHRYSENE	NE	15	148	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	**0.0399**	J	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
DIBENZOFURAN	NE	78	NE	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
DIETHYL PHTHALATE	NE	49000	48900	0.083	U	0.079	U	0.092	U	0.075	U	0.076	U	0.077	U	0.076	U	0.079	U	0.075	U	0.081	U	0.078	U
DIMETHYL PHTHALATE	NE	611000	611000	0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.083	U	0.079	U	0.092	U	0.075	U	0.076	U	0.077	U	0.076	U	0.079	U	0.075	U	0.081	U	0.078	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
FLUORANTHENE	NE	2300	2290	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	**0.0342**	J	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
FLUORENE	NE	2300	2290	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.092	U	0.087	U	0.1	U	0.082	U	0.084	U	0.084	U	0.084	U	0.087	U	0.083	U	0.089	U	0.085	U
HEXACHLOROETHANE	NE	12	42.8	0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
ISOPHORONE	NE	510	5120	0.021	U	0.02	UJ	0.023	UJ	0.019	UJ	0.019	UJ	0.019	UJ	0.019	UJ	0.02	UJ	0.019	UJ	0.02	UJ	0.019	UJ
M,P-CRESOL	NE	NE	NE	0.03	U	0.028	U	0.033	U	0.027	U	0.028	U	0.028	U	0.027	U	0.028	U	0.027	U	0.029	U	0.028	U
NAPHTHALENE	NE	3.6	43.0	0.033	U	0.032	U	0.037	U	0.03	U	0.031	U	0.031	U	0.03	U	0.031	U	0.03	U	0.032	U	0.031	U
NITROBENZENE	NE	4.8	53.5	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.25	U	0.24	U	0.28	U	0.22	U	0.23	U	0.23	U	0.23	U	0.24	U	0.23	U	0.24	U	0.23	U
PHENANTHRENE	NE	1830	1830	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
PHENOL	NE	18000	18300	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
PYRENE	NE	1700	1720	0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	**0.0325**	J	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U

Table 4-1
Soil Analytical Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC542-IS-0001-070212		OTC542-IS-0002-070212-FD		OTC542-IS-0003-070212		OTC542-IS-0004-070212		OTC542-IS-0005-070212		OTC542-IS-0006-070212		OTC542-IS-0007-070212		OTC542-IS-0008-070212		OTC542-IS-0009-070212		OTC542-IS-0010-070212		OTC542-IS-0011-070212	
				Sample Date	7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012	
				Location	Station 1, septic tank influent						Station 2, septic tank				Station 3, septic tank effluent				Station 4, septic tank leach field							
				Depth (ft bgs)	3 - 5		3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		23 - 25	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																										
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
1,3-DINITROBENZENE	NE	6.10	NE	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
2,4-DINITROTOLUENE	NE	1.60	15.7	0.094	U	0.076	U	0.086	U	0.071	U	0.086	U	0.092	U	0.084	U	0.084	U	0.08	U	0.086	U	0.088	U
2,6-DINITROTOLUENE	NE	61.0	61.1	0.084	U	0.068	U	0.077	U	0.063	U	0.077	U	0.082	U	0.076	U	0.075	U	0.071	U	0.077	U	0.079	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
2-NITROTOLUENE	NE	2.90	29.1	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
3-NITROTOLUENE	NE	6.10	7.82	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
4-NITROTOLUENE	NE	30.0	244.4	0.098	U	0.079	U	0.09	U	0.073	U	0.09	U	0.095	U	0.088	U	0.087	U	0.083	U	0.089	U	0.092	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
NITROBENZENE	NE	4.80	53.5	0.090	U	0.073	U	0.083	U	0.068	U	0.083	U	0.088	U	0.081	U	0.081	U	0.076	U	0.082	U	0.085	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
TETRYL	NE	240.0	244.0	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
METALS (mg/kg)																										
ALUMINUM	13700	77000	78000	**4570**		**4050**		**2230**		**4570**		**1760**		**5090**		**1740**		**6740**		**1830**		**2760**		**8930**	
ANTIMONY	1.6	31	31.3	1.1	U	0.94	U	0.88	U	0.82	U	1.4	U	1.2	U	1.1	U	0.95	U	1.1	U	1.1	U	0.85	U
ARSENIC	3.7	0.39	3.90	**1.5**	J	0.94	U	**1.2**	J	**1.1**	J	**0.84**	J	**1.3**	J	1.1	U	**2.1**	J	1.1	U	1.1	U	**2**	J
BARIUM	169.3	15000	15600	**52.8**	J	**47.9**	J	**26.6**	J	**46.2**	J	**20.2**	J	**52.5**	J	**19.4**	J	**83.1**	J	**21.9**	J	**36**	J	**87.7**	
BERYLLIUM	1.6	160	156	0.54	U	0.47	U	0.44	U	0.41	U	0.36	U	0.58	U	0.53	U	0.47	U	0.57	U	0.56	U	**0.49**	J
CADMIUM	0.3	70	70.3	0.54	U	0.47	U	0.44	U	0.41	U	0.72	U	0.58	U	0.53	U	0.47	U	0.57	U	0.56	U	0.43	U
CALCIUM	317000	NE	NE	**162000**		**211000**		**218000**		**114000**		**223000**		**246000**		**205000**		**203000**		**232000**		**248000**		**70800**	
CHROMIUM [d]	25	117000	117000	**4.4**	J	**3.5**	J	**3.3**	J	**6**		**2.2**	J	**6**		**1.6**	J	**5.9**		**1.5**	J	**2.4**	J	**10**	
COBALT	7.7	23	NE	**1.5**	J	**1.3**	J	**0.64**	J	**1.9**	J	**0.51**	J	**1.6**	J	0.53	U	**2.1**	J	0.57	U	**0.8**	J	**2.9**	J
COPPER	13	3100	3130	**3.5**	J	**3.3**	J	**1.8**	J	**2.5**	J	**1.1**	J	**4.2**	J	1.1	U	**5.6**	J	1.1	U	**2.7**	J	**4.2**	J
IRON	23000	55000	54800	**3840**		**3340**		**2100**		**4740**		**1730**		**4420**		**1620**		**5400**		**1610**		**2300**		**8470**	
LEAD	10.9	400	400	**4.3**	J	**3.4**	J	**8.9**		**3.2**	J	0.72	U	**3.6**	J	**1.1**	J	**3.4**	J	**1**	J	**2.2**	J	**6.2**	J
MAGNESIUM	17000	NE	NE	**5030**		**5310**		**1850**	J	**6760**		**1170**	J	**11500**		**1070**	J	**7240**		**1190**	J	**5160**		**4390**	
MANGANESE	393	1800	1860	**82.9**		**74.4**		**41.6**		**89.2**		**28.4**		**113**		**25.8**		**103**		**25**		**53.8**		**111**	
MERCURY	0.0108	10	15.6	0.0099	U	0.0098	U	0.011	U	**0.0099**	J	0.0089	U	**0.015**	J	0.0091	U	0.0096	U	0.0093	U	0.0096	U	0.009	U
NICKEL	17.4	1500	1560	**3.6**	J	**3.2**	J	**1.9**	J	**5.3**	J	**1.4**	J	**4.4**	J	**1.2**	J	**5**	J	**1.2**	J	**2.1**	J	**7.4**	J
POTASSIUM	5080	NE	NE	**1370**	J	**1210**	J	**617**	J	**1190**	J	**578**	J	**1330**	J	**519**	J	**2040**	J	**588**	J	**695**	J	**1900**	J
SELENIUM	1.4	390	391	2.2	U	1.9	U	1.8	U	1.6	U	2.9	U	2.3	U	2.1	U	1.9	U	2.3	U	2.2	U	1.7	U
SILVER	1.1	390	391	0.54	U	0.47	U	0.44	U	0.41	U	0.36	U	0.58	U	0.53	U	0.47	U	0.57	U	0.56	U	0.43	U
SODIUM	5200	NE	NE	590	U	520	U	480	U	**504**	J	400	U	640	U	580	U	520	U	630	U	620	U	470	U
THALLIUM	1.3	0.78	0.782	1.4	U	1.2	U	1.1	U	1.1	U	1.9	U	1.5	U	1.4	U	1.2	U	1.5	U	1.5	U	1.1	U
VANADIUM	42.6	390	391	**8**	J	**7.4**	J	**4**	J	**10.6**	J	**5.2**	J	**9.8**	J	**3.8**	J	**12.2**	J	**2.9**	J	**5.3**	J	**15.1**	J
ZINC	54.6	23000	23500	**13.8**		**10.1**		**24.8**		**13.7**		**3.8**	J	**19.3**		**3.6**	J	**16**		**3.8**	J	**11.9**		**22.8**	

Table 4-1
Soil Analytical Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC542-IS-0001-070212		OTC542-IS-0002-070212-FD		OTC542-IS-0003-070212		OTC542-IS-0004-070212		OTC542-IS-0005-070212		OTC542-IS-0006-070212		OTC542-IS-0007-070212		OTC542-IS-0008-070212		OTC542-IS-0009-070212		OTC542-IS-0010-070212		OTC542-IS-0011-070212	
				Sample Date	7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012	
				Location	Station 1, septic tank influent						Station 2, septic tank				Station 3, septic tank effluent				Station 4, septic tank leach field							
				Depth (ft bgs)	3 - 5		3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		23 - 25	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																										
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93		0.0081	U	0.0079	U	0.0092	UJ	0.0075	U	0.0078	U	0.0078	U	0.0076	U	0.0079	U	0.0076	U	0.008	U	0.0079	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49		0.01	U	0.0099	U	0.012	U	0.0094	U	0.0098	U	0.0098	U	0.0095	U	0.0098	U	0.0096	U	0.01	U	0.0099	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49		0.01	U	0.0099	U	0.012	U	0.0094	U	0.0098	U	0.0098	U	0.0095	U	0.0098	U	0.0096	U	0.01	U	0.0099	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22		0.0081	U	0.0079	U	0.0092	U	0.0075	U	0.0078	U	0.0078	U	0.0076	U	0.0079	U	0.0076	U	0.008	U	0.0079	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22		0.0081	U	0.0079	U	0.0092	U	0.0075	U	0.0078	U	0.0078	U	0.0076	U	0.0079	U	0.0076	U	0.008	U	0.0079	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12		0.0081	U	0.0079	U	0.0092	U	0.0075	U	0.0078	U	**0.0108**	J	0.0076	U	0.0079	U	0.0076	U	0.008	U	0.0079	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22		0.0081	U	0.0079	U	0.0092	UJ	0.0075	U	0.0078	U	0.0078	U	0.0076	U	0.0079	U	0.0076	U	0.008	U	0.0079	U
PETROLEUM HYDROCARBONS (mg/kg)																										
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000		3	U	2.8	U	4.3	U	2.4	U	2.8	U	2.8	U	3	U	2.9	U	3.1	U	3.3	U	2.7	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000		4.1	U	3.9	U	4.7	U	**5.31**	J	3.8	U	**4.83**	J	3.8	U	3.9	U	3.8	U	4	U	3.9	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000		4.1	U	3.9	U	4.7	U	**5.03**	J	3.8	U	**9.63**	J	3.8	U	3.9	U	3.8	U	4	U	3.9	U
CYANIDE (mg/kg)																										
CYANIDE	NE	22.0	46.9		0.074	U	0.071	U	0.084	U	0.13	U	0.067	U	0.07	U	0.068	U	0.067	U	0.069	U	0.071	U	0.068	U
TRITIUM (pCi/g)																										
TRITIUM	NE	NE	NE		5.95	U	5.9	U	5.71	U	5.73	U	5.93	U	5.95	U	5.99	U	5.35	U	5.98	U	5.97	U	5.66	U

Table 4-1
Soil Analytical Data
Buidling 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, February, Table A-1 updated June 2012.*

[a] The background concentration is Total Chromium and the screening levels are Chromium (III).

AFB = Air Force Base
dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Table 4-2
Groundwater Analytical Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NMWQCC WQS (µg/L)[c]	Sample Number: OTC542-GW-0001-082412	
				Sample date: 8/24/2012	
				Location: MW-01	
				Result	VQ
TOTAL DISSOLVED SOLIDS (mg/L)	NE	NE	10,000	**10,800**	
VOLATILES (µg/L)					
1,1,1-TRICHLOROETHANE	NE	200	60	0.2	U
1,1,2,2-TETRACHLOROETHANE	NE	NE	10	0.23	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	NE	NE	0.47	U
1,1,2-TRICHLOROETHANE	NE	5	10	0.22	U
1,1-DICHLOROETHANE	NE	NE	25	0.25	U
1,1-DICHLOROETHENE	NE	7	5	0.23	U
1,2,4-TRICHLOROBENZENE	NE	70	NE	0.5	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.2	NE	0.5	U
1,2-DIBROMOETHANE	NE	0.05	0.10	0.37	U
1,2-DICHLOROBENZENE	NE	600	NE	0.25	U
1,2-DICHLOROETHANE	NE	5	10	0.2	U
1,2-DICHLOROPROPANE	NE	5	NE	0.25	U
1,3-DICHLOROBENZENE	NE	NE	NE	0.2	U
1,4-DICHLOROBENZENE	NE	75	NE	0.23	U
2-HEXANONE	NE	NE	NE	4	U
ACETONE	NE	NE	NE	10	U
BENZENE	NE	5	10	0.2	U
BROMODICHLOROMETHANE	NE	80	NE	**0.44**	J
BROMOFORM	NE	80	NE	0.2	U
BROMOMETHANE	NE	NE	NE	0.5	U
CARBON DISULFIDE	NE	NE	NE	0.5	U
CARBON TETRACHLORIDE	NE	5	10	0.25	U
CHLOROBENZENE	NE	100	NE	0.2	U
CHLOROETHANE	NE	NE	NE	0.5	U
CHLOROFORM	NE	80	100	**2**	

Table 4-2
Groundwater Analytical Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NMWQCC WQS (µg/L)[c]	Sample Number: OTC542-GW-0001-082412	
				Sample date: 8/24/2012	
				Location: MW-01	
				Result	VQ
VOLATILES - continued (µg/L)					
CHLOROMETHANE	NE	NE	NE	0.5	U
CIS-1,2-DICHLOROETHYLENE	NE	70	NE	0.26	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	0.2	U
CYCLOHEXANE	NE	NE	NE	0.31	U
DIBROMOCHLOROMETHANE	NE	80	NE	0.2	U
DICHLORODIFLUOROMETHANE	NE	NE	NE	0.5	U
ETHYLBENZENE	NE	700	750	0.2	U
ISOPROPYLBENZENE	NE	NE	NE	0.2	U
METHYL ACETATE	NE	NE	NE	5	U
METHYL ETHYL KETONE	NE	NE	NE	2	U
METHYL ISOBUTYL KETONE	NE	NE	NE	2	U
METHYLCYCLOHEXANE	NE	NE	NE	0.38	U
METHYLENE CHLORIDE	NE	5	100	2	U
STYRENE	NE	100	NE	0.2	U
TERT-BUTYL METHYL ETHER	NE	NE	NE	0.34	U
TETRACHLOROETHYLENE	NE	5	20	0.25	U
TOLUENE	NE	1000	750	0.2	U
TRANS-1,2-DICHLOROETHENE	NE	100	NE	0.35	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.2	U
TRICHLOROETHYLENE	NE	5	100	**0.49**	J
TRICHLOROFLUOROMETHANE	NE	NE	NE	0.5	U
VINYL CHLORIDE	NE	2	1	0.22	U
XYLENES, TOTAL	NE	10000	620	0.52	U

Table 4-2
Groundwater Analytical Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC542-GW-0001-082412	
			Sample date	8/24/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NMWQCC WQS (µg/L)[c]	Result	VQ
SEMIVOLATILES (µg/L)					
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	0.51	U
2,4,5-TRICHLOROPHENOL	NE	NE	NE	0.48	U
2,4,6-TRICHLOROPHENOL	NE	NE	NE	0.48	U
2,4-DICHLOROPHENOL	NE	NE	NE	0.48	U
2,4-DIMETHYLPHENOL	NE	NE	NE	1	U
2,4-DINITROPHENOL	NE	NE	NE	9.5	U
2,4-DINITROTOLUENE	NE	NE	NE	0.48	U
2,6-DINITROTOLUENE	NE	NE	NE	0.48	U
2-CHLORONAPHTHALENE	NE	NE	30	0.48	U
2-CHLOROPHENOL	NE	NE	NE	0.48	U
2-METHYLNAPHTHALENE	NE	NE	30	0.54	U
2-METHYLPHENOL (O-CRESOL)	NE	NE	NE	0.51	U
2-NITROANILINE	NE	NE	NE	0.48	U
2-NITROPHENOL	NE	NE	NE	0.51	U
3,3'-DICHLOROBENZIDINE	NE	NE	NE	0.95	U
3-NITROANILINE	NE	NE	NE	0.48	U
4,6-DINITRO-2-METHYLPHENOL	NE	NE	NE	1.9	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.48	U
4-CHLORO-3-METHYLPHENOL	NE	NE	NE	0.48	U
4-CHLOROANILINE	NE	NE	NE	0.48	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.48	U
4-NITROANILINE	NE	NE	NE	0.48	U
4-NITROPHENOL	NE	NE	NE	4.8	U
ACENAPHTHENE	NE	NE	30	0.48	U
ACENAPHTHYLENE	NE	NE	30	0.48	U
ACETOPHENONE	NE	NE	NE	0.49	U
ANTHRACENE	NE	NE	30	0.48	U

Table 4-2
Groundwater Analytical Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC542-GW-0001-082412	
			Sample date	8/24/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NMWQCC WQS (µg/L)[c]**	Result	VQ
SEMIVOLATILES - continued (µg/L)					
ATRAZINE	NE	3	NE	0.65	U
BENZALDEHYDE	NE	NE	NE	4.8	U
BENZO(A)ANTHRACENE	NE	NE	30	0.48	U
BENZO(A)PYRENE	NE	0.2	0.7	0.48	U
BENZO(B)FLUORANTHENE	NE	NE	30	0.48	U
BENZO(G,H,I)PERYLENE	NE	NE	30	0.48	U
BENZO(K)FLUORANTHENE	NE	NE	30	0.48	U
BENZYL BUTYL PHTHALATE	NE	NE	NE	1	U
BIPHENYL	NE	NE	NE	0.48	U
BIS(2-CHLOROETHOXY) METHANE	NE	NE	NE	0.48	U
BIS(2-CHLOROETHYL) ETHER	NE	NE	NE	0.51	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	6	NE	**4.4**	J
CAPROLACTAM	NE	NE	NE	3.8	U
CARBAZOLE	NE	NE	NE	0.48	U
CHRYSENE	NE	NE	30	0.48	U
DIBENZ(A,H)ANTHRACENE	NE	NE	30	0.5	U
DIBENZOFURAN	NE	NE	NE	0.48	U
DIETHYL PHTHALATE	NE	NE	NE	1	U
DIMETHYL PHTHALATE	NE	NE	NE	0.94	U
DI-N-BUTYL PHTHALATE	NE	NE	NE	0.83	U
DI-N-OCTYLPHTHALATE	NE	NE	NE	1	U
FLUORANTHENE	NE	NE	30	0.48	U
FLUORENE	NE	NE	30	0.48	U
HEXACHLOROBENZENE	NE	1	NE	0.53	U
HEXACHLOROBUTADIENE	NE	NE	NE	0.95	U
HEXACHLOROCYCLOPENTADIENE	NE	50	NE	1.8	U
HEXACHLOROETHANE	NE	NE	NE	0.95	U

Table 4-2
Groundwater Analytical Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC542-GW-0001-082412	
			Sample date	8/24/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NMWQCC WQS (µg/L)[c]**	Result	VQ
SEMIVOLATILES - continued (µg/L)					
INDENO(1,2,3-C,D)PYRENE	NE	NE	30	0.48	U
ISOPHORONE	NE	NE	NE	0.48	U
M,P-CRESOL	NE	NE	NE	1	U
NAPHTHALENE	NE	NE	30	0.76	U
NITROBENZENE	NE	NE	NE	0.56	U
N-NITROSODI-N-PROPYLAMINE	NE	NE	NE	0.48	U
N-NITROSODIPHENYLAMINE	NE	NE	NE	0.95	U
PENTACHLOROPHENOL	NE	1	NE	5.1	U
PHENANTHRENE	NE	NE	30	0.48	U
PHENOL	NE	NE	NE	0.48	U
PYRENE	NE	NE	30	0.48	U
EXPLOSIVES (µg/L)					
1,3,5-TRINITROBENZENE	NE	NE	NE	0.077	U
1,3-DINITROBENZENE	NE	NE	NE	0.093	U
2,4,6-TRINITROTOLUENE	NE	NE	NE	0.077	U
2,4-DINITROTOLUENE	NE	NE	NE	0.077	U
2,6-DINITROTOLUENE	NE	NE	NE	0.077	U
2-AMINO-4,6-DINITROTOLUENE	NE	NE	NE	0.077	U
2-NITROTOLUENE	NE	NE	NE	0.077	U
3-NITROTOLUENE	NE	NE	NE	0.077	U
4-AMINO-2,6-DINITROTOLUENE	NE	NE	NE	0.079	U
4-NITROTOLUENE	NE	NE	NE	0.077	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	NE	NE	0.077	U
NITROBENZENE	NE	NE	NE	0.081	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	NE	NE	0.077	U
TETRYL	NE	NE	NE	0.077	U

Table 4-2
Groundwater Analytical Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC542-GW-0001-082412	
			Sample date	8/24/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NMWQCC WQS (µg/L)[c]**	Result	VQ
METALS (µg/L)					
ALUMINUM	1043	NE	NE	**73.2**	J
ANTIMONY	6	6	NE	**8.3**	J
ARSENIC	10	10	100	2	U
BARIUM	38	2000	1000	**15**	J
BERYLLIUM	4	4	NE	1	U
CADMIUM	5	5	10	2	U
CALCIUM	1,136,664	NE	NE	**565,000**	
CHROMIUM, TOTAL	12	100	50	2	U
COBALT	36	NE	NE	**2**	J
COPPER	9.8	1300	1000	**13.3**	J
IRON	300	NE	1000	35	U
LEAD	9	15	50	2	U
MAGNESIUM	3,692,782	NE	NE	**537,000**	
MANGANESE	50	NE	200	**233**	
MERCURY	0.5	2	2	0.05	U
NICKEL	22	NE	NE	**2.4**	J
POTASSIUM	212,144	NE	NE	**28,300**	
SELENIUM	50	50	50	**19.7**	J
SILVER	10	NE	50	1	U
SODIUM	20,989,580	NE	NE	**2,410,000**	
THALLIUM	2	2	NE	3.7	U
VANADIUM	90	NE	NE	**14.1**	J
ZINC	17	NE	10000	**10**	J

Table 4-2
Groundwater Analytical Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC542-GW-0001-082412	
			Sample date	8/24/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NMWQCC WQS (µg/L)[c]**	Result	VQ
PCBs (µg/L)					
PCB-1016 (AROCHLOR 1016)	NE	NE	1	0.19	U
PCB-1221 (AROCHLOR 1221)	NE	NE	1	0.24	U
PCB-1232 (AROCHLOR 1232)	NE	NE	1	0.24	U
PCB-1242 (AROCHLOR 1242)	NE	NE	1	0.19	U
PCB-1248 (AROCHLOR 1248)	NE	NE	1	0.19	U
PCB-1254 (AROCHLOR 1254)	NE	NE	1	0.19	U
PCB-1260 (AROCHLOR 1260)	NE	NE	1	0.19	U
PETROLEUM HYDROCARBONS (µg/L) [e]					
GASOLINE RANGE ORGANICS C6-C10	NE	NE	See individual VOC & SVOC	50	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	400	95	U
OIL RANGE ORGANICS C28-C40	NE	NE	200	95	U
CYANIDE (µg/L)					
CYANIDE	NE	200	200	5	U
TRITIUM (pCi/L)					
TRITIUM	NE	NE	NE	309	U

Table 4-2
Groundwater Analytical Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NM WQCC Water Quality Standard

Value exceeds EPA Maximum Contaminant Level

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," letter to D. Scruggs, Chief, Environmental Restoration Program, Holloman Air Force Base from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, New Mexico Environment Department, March 1.*

[b] *U.S. Environmental Protection Agency (EPA), 2012, National Primary Drinking Water Regulations: List of Drinking Water Contaminants and Maximum Contaminant Levels.*

[c] *New Mexico Water Quality Control Commission, Water Quality Standards, 20.6.2 New Mexico Administrative Code.*

[d]New Mexico Environment Department (NMED), 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, New Mexico Environment Department, Santa Fe, New Mexico, February, Table 6-2. TPH Screening Guidelines for Potable Groundwater (GW-1), February 2012, Table A-1: NMED Soil Screening Levels, updated June 2012. "Unknown oil" criteria used for Oil Range Oraganics.

EPA = U.S. Environmental Protection Agency
GW = groundwater
J = estimated value
MCL = Maximum Contaminant Level
µg/L = micrograms per liter
mg/L = milligrams per liter
NA = not analyzed
NE = not established
NMWQCC= New Mexico Water Quality Control Commission
pCi/L = picocuries per liter
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
U = not detected at the detection limit shown
VQ = validation qualifier
WQS = Water Quality Standard

Table 4-3
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	LDY-IDW01-090412	
		Sample Date	9/4/2012	
		Sample Type	Waste Characterization	
		40 CFR 261 Waste Characteristic Criteria	Result	Lab Qual
General Chemistry				
Corrosivity as pH	pH Units	> 2 and < 12.5	**7.7**	
Cyanide Reactivity	mg/kg	< 250	1.5	U
Ignitability (Flashpoint)	°F	> 140 °F	>200	
Solids, Percent	%	NA	**84.4**	
Sulfide Reactivity	mg/kg	< 500	59	U
TCLP Volatiles				
Benzene	mg/L	0.5	0.0020	U
Chlorobenzene	mg/L	100	0.0020	U
Chloroform	mg/L	6	0.0022	U
Carbon tetrachloride	mg/L	0.5	0.0025	U
1,1-Dichloroethylene	mg/L	0.7	0.0023	U
1,2-Dichloroethane	mg/L	0.5	0.0020	U
p-Dichlorobenzene	mg/L	7.5	0.0023	U
Methyl ethyl ketone	mg/L	200	0.020	U
Tetrachloroethylene	mg/L	0.7	0.0025	U
Trichloroethylene	mg/L	0.5	0.0026	U
Vinyl chloride	mg/L	0.2	0.0022	U
TCLP Semivolatiles				
2-Methylphenol	mg/L	200	0.0054	U
3&4-Methylphenol	mg/L	200	0.011	U
Pentachlorophenol	mg/L	100	0.054	U
2,4,5-Trichlorophenol	mg/L	400	0.0050	U
2,4,6-Trichlorophenol	mg/L	2	0.0050	U
1,4-Dichlorobenzene	mg/L	7.5	0.0100	U
2,4-Dinitrotoluene	mg/L	0.13	0.0050	U
Hexachlorobenzene	mg/L	0.13	0.0056	U
Hexachlorobutadiene	mg/L	0.5	0.0100	U
Hexachloroethane	mg/L	3	0.010	U
Nitrobenzene	mg/L	2	0.0059	U
Pyridine	mg/L	100	0.016	U
TCLP Metals				
Arsenic	mg/L	5	0.020	U
Barium	mg/L	100	**0.12**	J
Cadmium	mg/L	1	0.010	U
Chromium	mg/L	5	0.010	U
Lead	mg/L	5	0.010	U
Mercury	mg/L	0.2	0.00050	U
Selenium	mg/L	1	0.020	U
Silver	mg/L	5	0.010	U

Table 4-3
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

°F = degrees Fahrenheit
> = greater than
< = less than
% = percent
CFR = Code of Federal Regulations
J = estimated value
Lab Qual = laboratory qualifier
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
NA = not applicable
TCLP = Toxicity Characteristic Leaching Procedure
U = not detected at the detection limit shown

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles				
Acetone	µg/L	NE	10	U
Benzene	µg/L	5	0.21	U
Bromodichloromethane	µg/L	80	0.20	U
Bromoform	µg/L	80	0.34	U
Chlorobenzene	µg/L	100	0.20	U
Chloroethane	µg/L	NE	0.50	U
Chloroform	µg/L	80	0.26	U
Carbon disulfide	µg/L	NE	0.49	U
Carbon tetrachloride	µg/L	5	0.31	U
Cyclohexane	µg/L	NE	0.48	U
1,1-Dichloroethane	µg/L	NE	0.21	U
1,1-Dichloroethylene	µg/L	7	0.20	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.71	U
1,2-Dibromoethane	µg/L	0.05	0.30	U
1,2-Dichloroethane	µg/L	5	0.22	U
1,2-Dichloropropane	µg/L	5	0.26	U
Dibromochloromethane	µg/L	80	0.20	U
Dichlorodifluoromethane	µg/L	NE	0.50	U
cis-1,2-Dichloroethylene	µg/L	70	**0.42**	J
cis-1,3-Dichloropropene	µg/L	NE	0.22	U
m-Dichlorobenzene	µg/L	NE	0.25	U
o-Dichlorobenzene	µg/L	600	0.22	U
p-Dichlorobenzene	µg/L	75	0.20	U
trans-1,2-Dichloroethylene	µg/L	100	0.23	U
trans-1,3-Dichloropropene	µg/L	NE	0.21	U
Ethylbenzene	µg/L	700	0.29	U
Freon 113	µg/L	NE	0.33	U
2-Hexanone	µg/L	NE	2.0	U
Isopropylbenzene	µg/L	NE	0.20	U
4-Methyl-2-pentanone	µg/L	NE	2.3	U
Methyl Acetate	µg/L	NE	5.0	U
Methyl bromide	µg/L	NE	0.79	U
Methyl chloride	µg/L	NE	0.50	U
Methylcyclohexane	µg/L	NE	0.20	U
Methylene chloride	µg/L	5	2.0	U
Methyl ethyl ketone	µg/L	NE	3.1	U
Methyl Tert Butyl Ether	µg/L	NE	0.21	U
Styrene	µg/L	100	0.20	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles (continued)				
1,1,1-Trichloroethane	µg/L	200	0.20	U
1,1,2,2-Tetrachloroethane	µg/L	NE	0.24	U
1,1,2-Trichloroethane	µg/L	5	0.20	U
1,2,4-Trichlorobenzene	µg/L	70	0.50	U
Tetrachloroethylene	µg/L	5	0.32	U
Toluene	µg/L	1000	0.20	U
Trichloroethylene	µg/L	5	0.31	U
Trichlorofluoromethane	µg/L	NE	0.50	U
Vinyl chloride	µg/L	2	0.44	U
Xylene (total)	µg/L	10000	0.50	U
Semivolatiles				
2-Chlorophenol	µg/L	NE	0.68	U
4-Chloro-3-methyl phenol	µg/L	NE	0.78	U
2,4-Dichlorophenol	µg/L	NE	0.67	U
2,4-Dimethylphenol	µg/L	NE	0.74	U
2,4-Dinitrophenol	µg/L	NE	5.0	U
4,6-Dinitro-o-cresol	µg/L	NE	1.4	U
2-Methylphenol	µg/L	NE	0.69	U
3&4-Methylphenol	µg/L	NE	1.3	U
2-Nitrophenol	µg/L	NE	0.65	U
4-Nitrophenol	µg/L	NE	4.8	U
Pentachlorophenol	µg/L	1	4.8	U
Phenol	µg/L	NE	0.53	U
2,4,5-Trichlorophenol	µg/L	NE	0.86	U
2,4,6-Trichlorophenol	µg/L	NE	0.75	U
Acenaphthene	µg/L	NE	0.67	U
Acenaphthylene	µg/L	NE	0.67	U
Acetophenone	µg/L	NE	0.72	U
Anthracene	µg/L	NE	0.72	U
Atrazine	µg/L	3	0.83	U
Benzaldehyde	µg/L	NE	4.8	U
Benzo(a)anthracene	µg/L	NE	0.52	U
Benzo(a)pyrene	µg/L	0.2	0.55	U
Benzo(b)fluoranthene	µg/L	NE	0.73	U
Benzo(g,h,i)perylene	µg/L	NE	0.64	U
Benzo(k)fluoranthene	µg/L	NE	0.64	U
4-Bromophenyl phenyl ether	µg/L	NE	0.76	U
Butyl benzyl phthalate	µg/L	NE	0.68	U
1,1'-Biphenyl	µg/L	NE	0.92	U
2-Chloronaphthalene	µg/L	NE	0.70	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Semivolatiles (continued)				
4-Chloroaniline	µg/L	NE	0.66	U
Caprolactam	µg/L	NE	2.4	U
Carbazole	µg/L	NE	0.50	U
Chrysene	µg/L	NE	0.56	U
bis(2-Chloroethoxy)methane	µg/L	NE	0.67	U
bis(2-Chloroethyl)ether	µg/L	NE	0.69	U
bis(2-Chloroisopropyl)ether	µg/L	NE	0.76	U
4-Chlorophenyl phenyl ether	µg/L	NE	0.84	U
2,4-Dinitrotoluene	µg/L	NE	0.66	U
2,6-Dinitrotoluene	µg/L	NE	0.77	U
3,3'-Dichlorobenzidine	µg/L	NE	0.71	U
Dibenzo(a,h)anthracene	µg/L	NE	0.56	U
Dibenzofuran	µg/L	NE	0.72	U
Di-n-butyl phthalate	µg/L	NE	0.96	U
Di-n-octyl phthalate	µg/L	NE	0.96	U
Diethyl phthalate	µg/L	NE	0.96	U
Dimethyl phthalate	µg/L	NE	0.77	U
bis(2-Ethylhexyl)phthalate	µg/L	6	1.1	U
Fluoranthene	µg/L	NE	0.56	U
Fluorene	µg/L	NE	0.73	U
Hexachlorobenzene	µg/L	1	0.66	U
Hexachlorobutadiene	µg/L	NE	0.92	U
Hexachlorocyclopentadiene	µg/L	50	0.76	U
Hexachloroethane	µg/L	NE	0.71	U
Indeno(1,2,3-cd)pyrene	µg/L	NE	0.55	U
Isophorone	µg/L	NE	0.61	U
2-Methylnaphthalene	µg/L	NE	0.66	U
2-Nitroaniline	µg/L	NE	0.72	U
3-Nitroaniline	µg/L	NE	0.62	U
4-Nitroaniline	µg/L	NE	0.93	U
Naphthalene	µg/L	NE	0.61	U
Nitrobenzene	µg/L	NE	0.69	U
N-Nitroso-di-n-propylamine	µg/L	NE	0.82	U
N-Nitrosodiphenylamine	µg/L	NE	0.96	U
Phenanthrene	µg/L	NE	0.68	U
Pyrene	µg/L	NE	0.65	U
Petroleum Hydrocarbons				
Gasoline Range Organics (C6-C10)	mg/L	NE	0.05	U
Diesel Range Organics (C10-C28)	mg/L	NE	**0.115**	J
Oil Range Organics (C28-C40)	mg/L	NE	0.10	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Metals				
Aluminum	µg/L	NE	**36.2**	J
Antimony	µg/L	6	**6.7**	J
Arsenic	µg/L	10	2.5	U
Barium	µg/L	2000	**29.1**	J
Beryllium	µg/L	4	0.50	U
Cadmium	µg/L	5	1.0	U
Calcium	µg/L	NE	**654,000**	
Chromium	µg/L	100	4	U
Cobalt	µg/L	NE	**6.2**	J
Copper	µg/L	1300	**2.9**	J
Iron	µg/L	NE	**97.5**	J
Lead	µg/L	15	2.2	U
Magnesium	µg/L	NE	**310,000**	
Manganese	µg/L	NE	**179**	
Mercury	µg/L	2	0.03	U
Nickel	µg/L	NE	**3.7**	J
Potassium	µg/L	NE	**16,500**	
Selenium	µg/L	50	4.0	U
Silver	µg/L	NE	0.50	U
Sodium	µg/L	NE	**762,000**	
Thallium	µg/L	2	0.078	U
Vanadium	µg/L	NE	**4.5**	J
Zinc	µg/L	NE	**12.8**	J

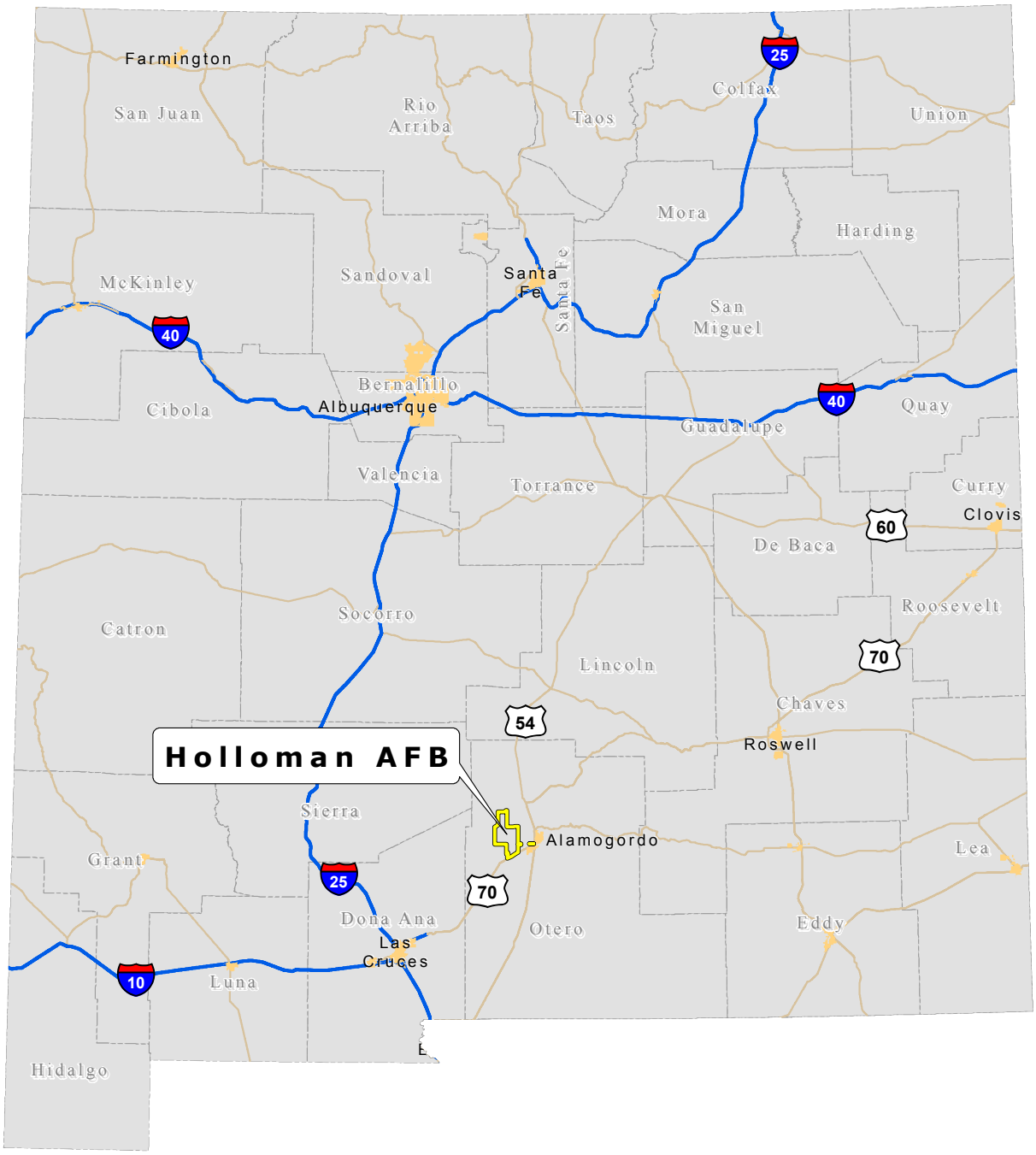
Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

[a] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

EPA = U.S. Environmental Protection Agency.
J = estimated value.
MCL = maximum contaminant level.
µg/L = micrograms per liter.
mg/L = milligrams per liter.
NE = not established
RSL = regional screening level.
U = not detected at the detection limit shown.
VQ = validation qualifier.

Figures



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Date: 8/28/2013

Approved By: BFoss

Checked By: CLong

Drawn By: BGrod

Office: Hou

Legend

Holloman AFB

N

WGS 84 UTM Zone 13N Meters

0 20 40 80
Kilometers

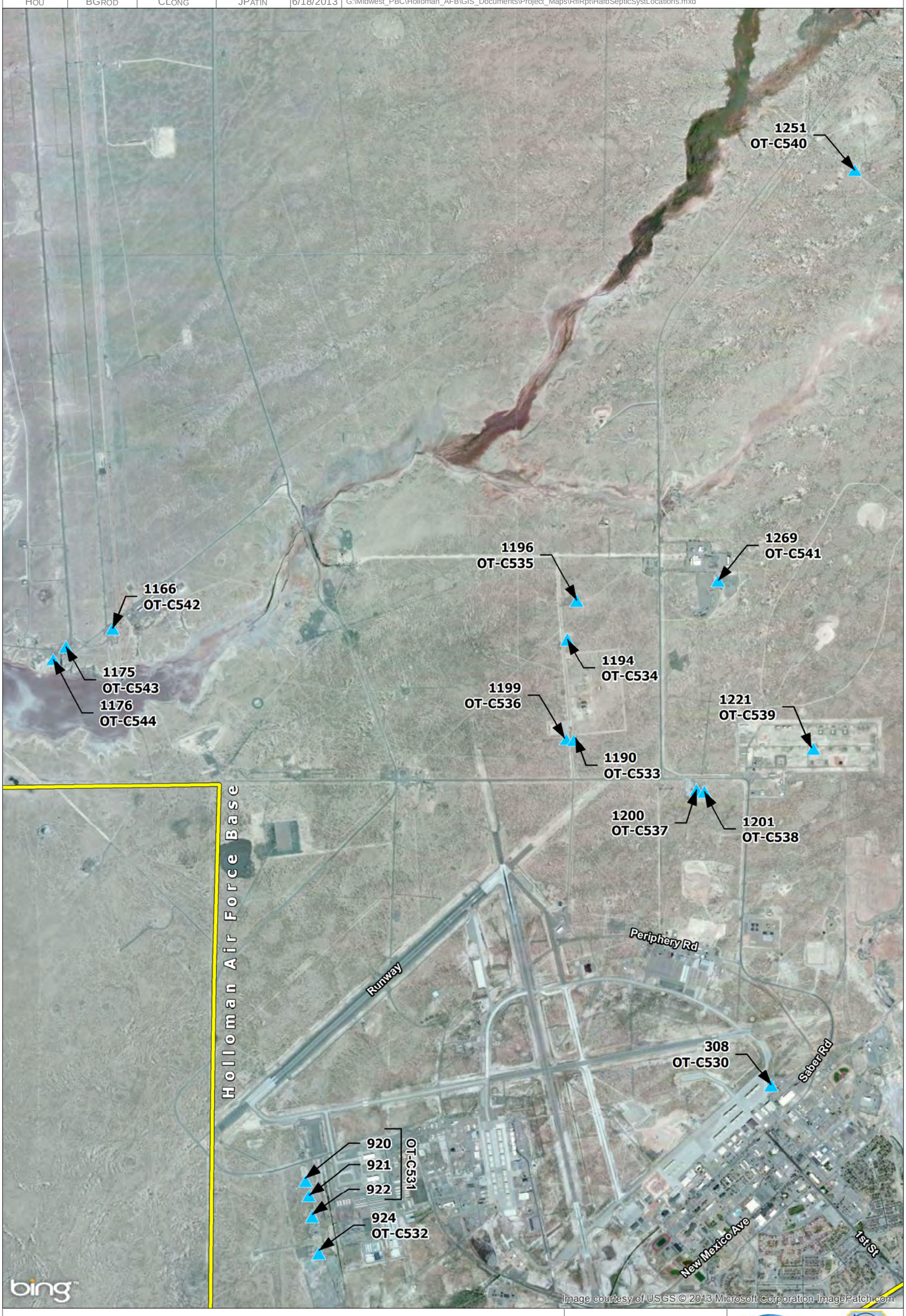
0 10 20 40
Miles

Figure 1-1

Holloman Air Force Base Location

Holloman AFB, New Mexico

Office	Drawn By	Checked By	Approved By	Date	File Path
Hou	BGrod	CLong	JPatin	6/18/2013	G:\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbSepticSystLocations.mxd



LEGEND

- Holloman AFB
- Septic Tank System

N

WGS 84 UTM Zone 13N
Meters

1 inch = 2,800 feet

0 700 1,400 2,800
Feet

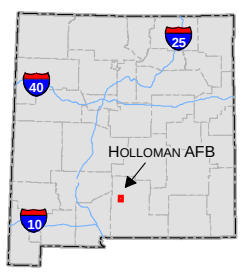
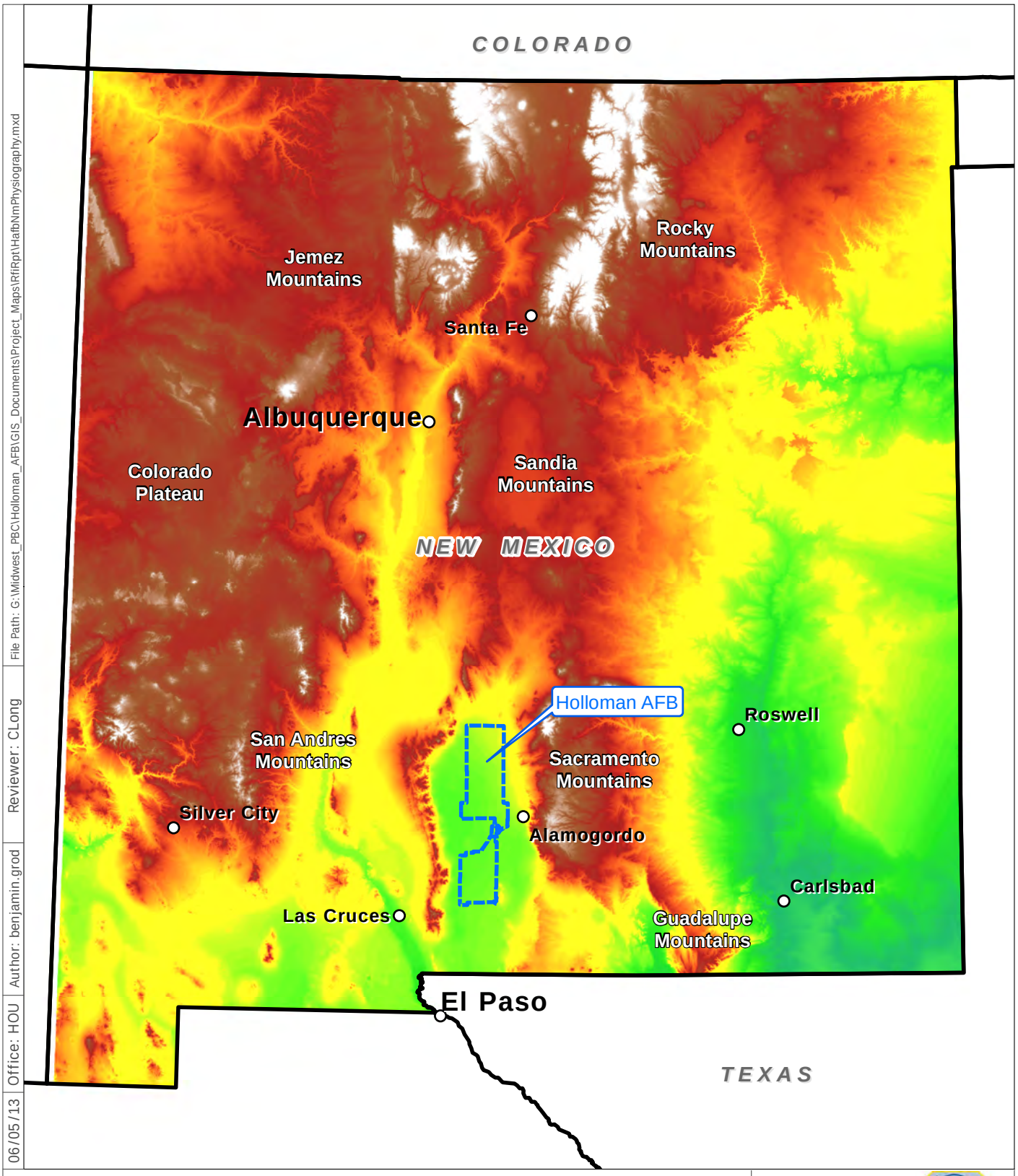


Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
Holloman AFB, NM



File Path: G:\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbNmPhysiography.mxd
Reviewer: CLong
Author: benjamin.grod
Office: HOU
06/05/13

Legend

Holloman Air Force Base (AFB) Installation Area

Elevation
- High : 3,936 meters
- Low : 0 meters

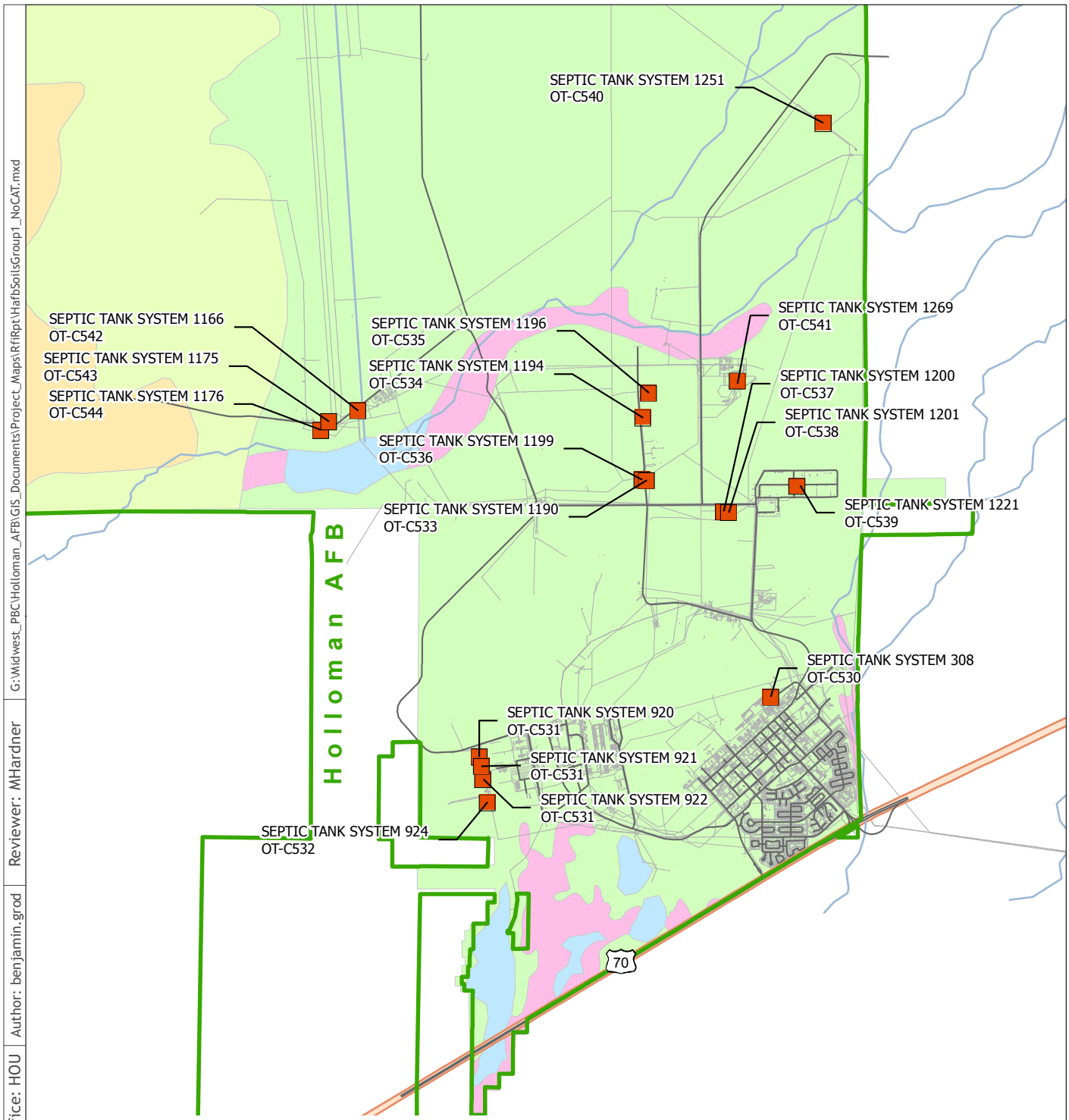
NAD 83 SPCS
New Mexico Central
Feet

0 50
Miles

Figure 2-1

Physiographic Map

Holloman AFB, New Mexico



Note:
1) Soils types at Holloman Air Force Base, New Mexico are based on United States Department of Agriculture (USDA) Soil Conservation Service Classifications. Source USDA, 1981

06/18/13 | Office: HOU | Author: benjamin.grod | Reviewer: MHardner | G:\Widwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbSoilsGroup1_NoCAT.mxd

Legend

- Installation Area
- Group 1 Septic Tank Sites
- Surface Water
- Active Dune Land Gypsum
- Duneland Yesum Association
- Holloman-Gypsum Land-Yesum complex
- Intermittent Water
- Mead Silty Clay Loam
- Rock Land Warm

NAD 83 SPCS
New Mexico Central
Feet

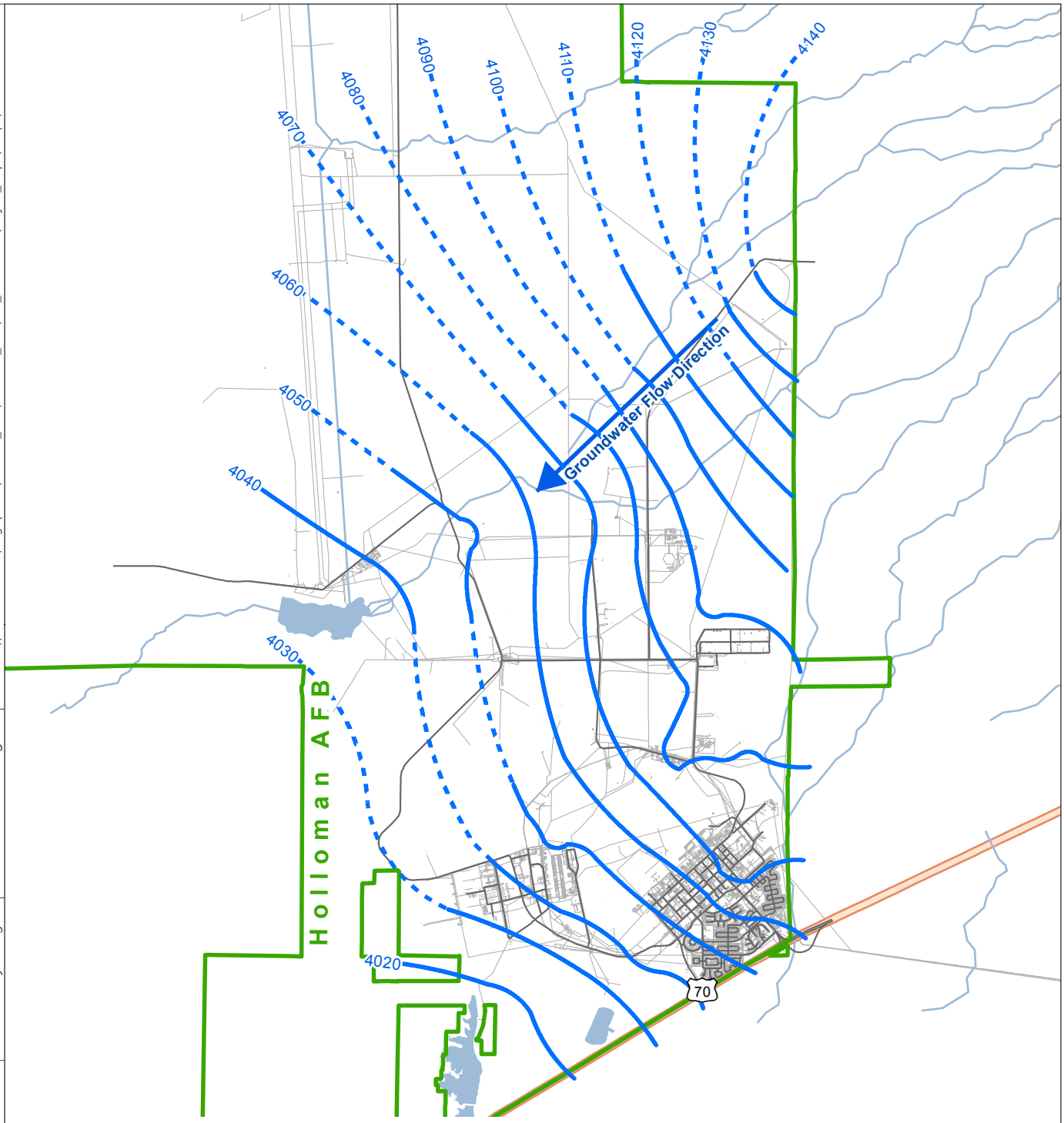
0 7,000
Feet

CBI

Figure 2-2

Septic Systems Soils Map

Holloman AFB, New Mexico



Note:
1) Groundwater contour map showing groundwater elevation contours across Holloman Air Force Base, New Mexico, are based on 2002 measurements taken from the shallow aquifer.
2) Source: Holloman AFB GIS, 2002 LTM.

08/28/13 | Office: HOU | Author: benjamin.grod | Reviewer: CLong | File Path: \\cfsfs01.cfs.com\arcgisprod2\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbGw2002.mxd

Legend

- Installation Area
- Groundwater Flow Direction
- Groundwater Elevation Contour (ft) (Dashed where inferred)
- Surface Water

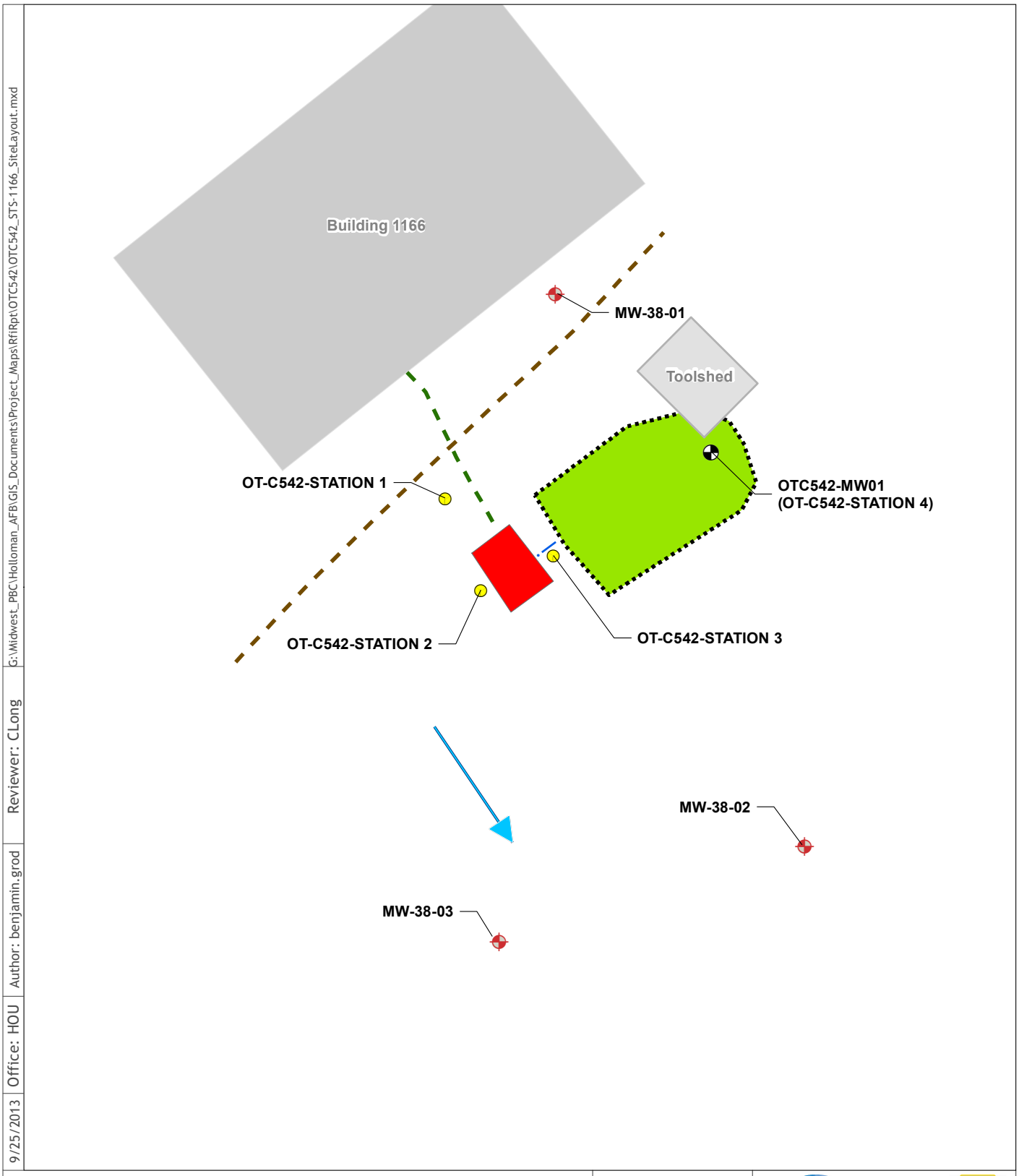
NAD 83 SPCS
New Mexico Central
Feet

0 8,000
Feet

Figure 2-3

Regional Groundwater Contour Map

Holloman AFB, New Mexico



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Legend

- Monitoring Well
- Soil Boring Station
- Existing Monitoring Well
- Unknown Utility
- Leach Field
- Septic Tank
- Building
- Effluent Line
- Influent Line
- Apparent groundwater flow direction

(from: Bhate Associates, 2007, Accelerated Corrective Measures Completion Report, Figure 3-10, June.)

N

NAD 83 SPCS
New Mexico Central
Feet

0 10 20
Feet

CBI

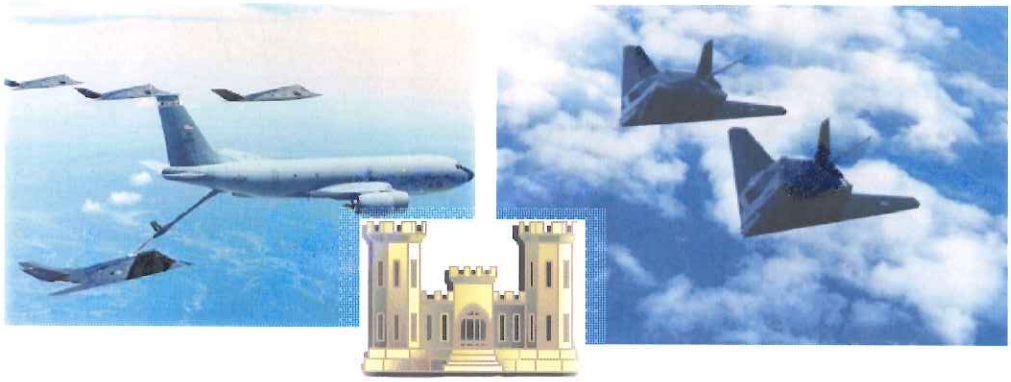
Figure 3-1

Site Layout and
Sampling Locations
Building 1166
Septic Tank System OT-C542

Holloman AFB, New Mexico

Appendix A
Historical Records

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS



Holloman Air Force Base
New Mexico

APRIL 2007

Headquarters, Air Combat Command
Langley Air Force Base, Virginia

49 CES/CEV
Holloman Air Force Base, New Mexico

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH FIGHTER WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

APR 27 2007

MEMORANDUM FOR NEW MEXICO ENVIRONMENT DEPARTMENT
Attn: Mr. James P. Bearzi
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe NM 87505-6303

FROM: 49 CES/CEV
550 Tabosa Ave.
Holloman AFB NM 88330-8458

SUBJECT: Submittal of Information Required by NMED Letter of August 30, 2006
Septic Tanks and Associated Drain Fields, Holloman AFB
EPA ID# NM6572124422

1. Pursuant to Part 4, Condition IV.B.3 of Permit No. NM6572124422, Holloman AFB is submitting the final portion of the required information.

2. This final portion of the required information covers the history of the facilities served by each septic tank and, based on the historic activities that occurred in each facility, the possible wastes that were discharged into the septic systems.

3. If you have any questions or comments, please contact Mr. Dave Griffin or Mr. George Fish at (505) 572-3931.

DEBORAH J. HARTELL
Chief, Environmental Flight

cc: w/Attachments
Mr. Cornelius Amindyas
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

Mr. David Strasser
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS
HISTORY

Holloman's records show a list of fifty seven (57) septic tank systems broken into three categories- Active Septic Systems, Inactive Septic Systems, and Removed Septic Systems. The systems are identified by the Building number they are/were attached to. There are twenty five (25) Active Septic Systems which are listed in this report. There are twenty one (21) Inactive Septic Systems that are listed and the history of activities in the building associated with the system is identified to the extent of available knowledge. There are eleven (11) Removed Septic Systems listed with histories based on available record knowledge.

The Active systems are identified, but no histories of the buildings are provided as this will likely change over time particularly with change in mission (aircraft on base) or tie-in to the base waste water treatment system. A history will be added to this list if and when the septic system is no longer needed and moved to the Inactive or Removed list.

The Inactive systems are scheduled for proper closure per guidance given in the NMED Liquid Waste Regulation 20.7.3.307 NMAC. This regulation calls for capping of the line(s) from the building to the septic tank, pumping out the tanks contents, penetration of the bottom of the tank, along with collapse of the tank roof and filling of the tank with sand or soil.

The septic systems on the Removed list have had the actual septic tank excavated and removed.

A search of Real Property records and the Historic Properties Inventory yielded the information available on the buildings. There was not information available on every building, but if new information becomes available, it will be added to the list.

Attachment 54a-e shows the current plan of where the sewer system lies to show what buildings are currently connected to Holloman's Sewer System. Any building that does not have an active septic tank is either abandoned or connect to Holloman's Sewer System.

ACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	149	1998		1000
2	312	1994		1000
3	375	1968		500
4	882			
5	864 (863)	1994	5'x8'x6'4"	750
6	885	1970	7'10"x4'8"x6'10"	1000
7	886			
8	887	1991		1000
9	923	1959	4'2"x7"x7'9.5"	1600
10	1022	1992		1200
11	1066	1994		1000
12	1160	1957	5'x12'4"x7'6"	1500
13	1161	1957		750
14	1162	1957		350
15	1163	1957		350
16	1169	1962		1680
17	1195	1962		1260
18	1256	1970	12'8"x4'8"x5'	
19	1270			
20	1271			
21	1278	2004		1250
22	1284			
23	1625			
24	75600	1989		1200
25	La Luz Gate (1290)(**1292**)	2004		1250

INACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	308	1965		
2	920	1959	4'2"x7"x7'9.5"	1600
3	921	1959	4'2"x7"x7'9.5"	1600
4	922	1959	4'2"x7"x7'9.5"	1600
5	924	1959	4'2"x7"x7'9.5"	1600
6	1091	1969	6'8"x3'x8'5"	
7	1097	1987	5'10"x5'x7'8"	1672
8	1190	1952	9'x4'x8'10"	3000
9	1194	1987	4'x4'x8'10"	1350
10	1196	1993	4'6"x11'x6'	1300
11	1199	1957		500
12	1200	1954	4'x8'x4'	1000
13	1201	1951	2'6"x6'6"x5'5"	650
14	1219	1985	5'4"x10'6"x8'4"	
15	1221	1983	4'8"x9'4"x6'2"	1100
16	1226	1985	5'6'2"x6'	
17	1235	1986		1189
18	1239	1977	4'6"x8'6"x6'	750
19	1250	1957		350
20	1251			
21	1269	1966	4'6"x9'	500

INACTIVE SEPTIC SYSTEMS

BUILDING 308

This is a 3200 SF building originally constructed in 1965. The original operation in the building was calibration of guided weapons for aircraft. In the 1970s and early 1980s the building was used as a nosedock for F-4 - Test Aircraft Radar electronic work area. It has never had a floor drain.
This facility is currently being used to store air craft support equipment for Building 309. The shop has been used in the past for servicing, inspecting, and repairing AGE equipment, but due to the reduction in personnel, this work is currently only performed in Building 309. The need to expand the work area for AGE equipment maintenance into Building 308 in the near future is not anticipated. A current view of the building is shown below in Figure 1.

Figure 1: Picture of Bldg. 308

Facilities associated with the septic system consist of:

- Toilet
- Lavatory
- Janitorial Sink

The building is located at 340 Delaware Ave. The point of contact for this building is Ms. Vicky Cruz and Mr. Adam Ferrara, they can be reached at 575-~~475~~-5272. The hours

572

of operation for this building when it is in use is one 8.5 hr shift (0630-1500) and one 9 hr shift (1500-2400), five days per week.

Industrial Wastewater Drainage: There are no floor or trench drains in this facility. A janitor's sink is located in the restroom. The sanitary sewer pipe from the restroom connects with the pipe from the restrooms in Building in 309. The effluent pipe then proceeds south to Manhole 334E the layout of this facility can be seen below in **Figure 2**. At the time of the inspection surveyors were unable to open Manhole 334E. No cross-connections to the storm sewer were identified.

Industrial Wastewater Sources/Existing Pretreatment/ Existing Management Practices: There is only once source of industrial wastewater from this facility: floor washing

Floor Washing: The floor in this facility is washed every three months using a Tennant floor scrubber, 10 gallons of water and Simple Green. Average and maximum daily wastewater flows from this activity are estimated to be less than one gallon and ten gallons, respectively. The wastewater from this activity is discharged into the French drain at Building 309; therefore, the quantity of wastewater generated by this activity is included in the flow summary for Building 309.

Existing management practices consist of sweeping the floor prior to washing it.

Site Description: Aircraft Corrosion Control
Site Specific Contingency Action Plan: See Attachment 1
Secondary Containment Routes: None
Probable Spill Route: Leaks dissipate in local area on ground
Material Compatibility: No material incompatibilities

Connected to Sewer?

Stored Substances:

Chemical	Container Type
MEK	1 gallon can
Polyurethane Paint	1 gallon can
Naptha	1 gallon can
Toluene	1 gallon can
Epoxy Primer	1 gallon can
PD-680 Type II	55 gallon drum
Waste Paint/Thinners	55 gallon drum

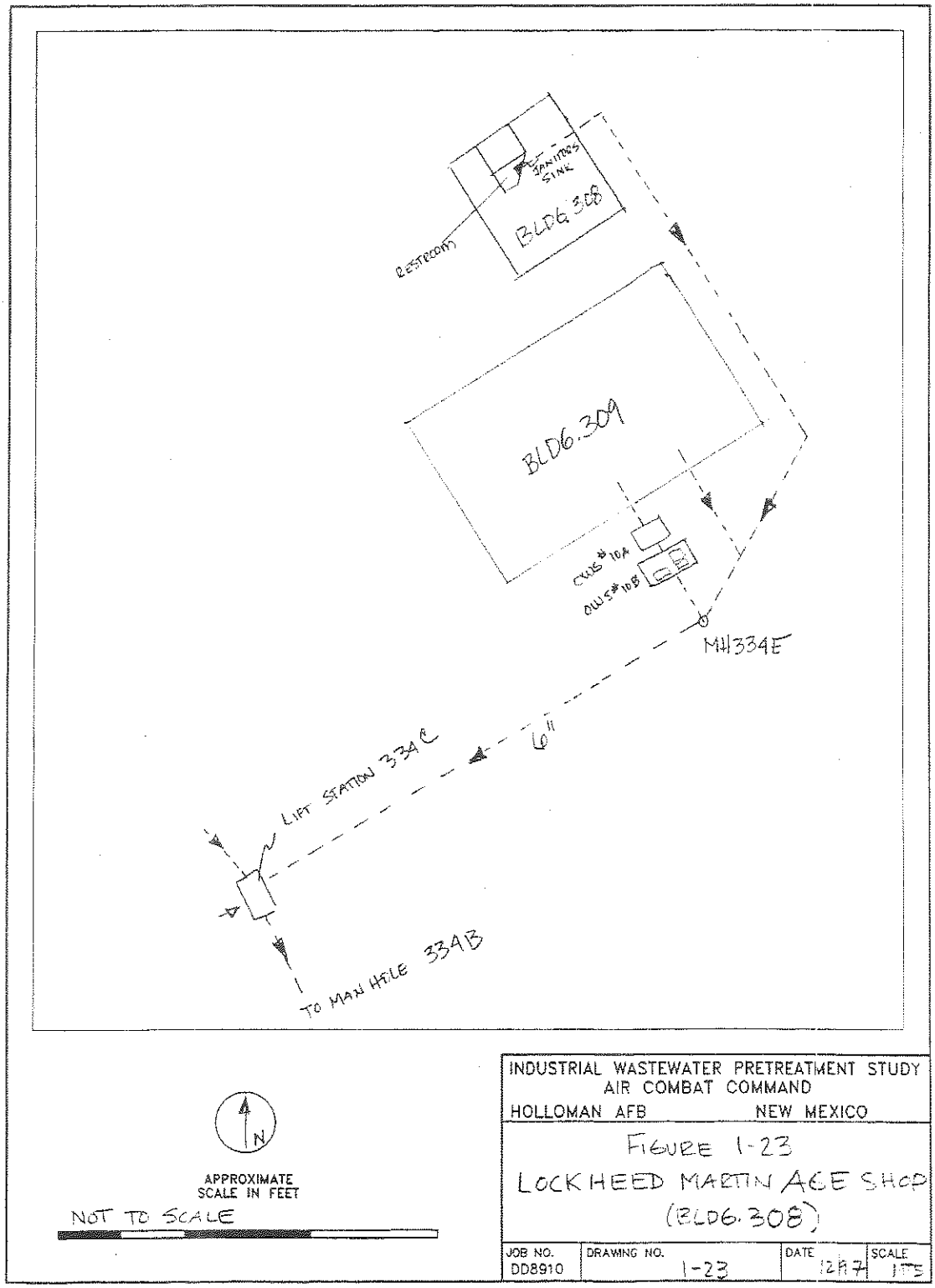


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Figure 2: Layout of Bldg. 308 and 309

INACTIVE SEPTIC SYSTEMS

BUILDINGS 920, 921, 922

These are three identical buildings constructed in 1959. Each building has 1900 SF. They were originally built for ammunition assembly which primarily consisted of bolting rocket components together prior to use. All three buildings are presently vacant and empty.
Each of the three buildings has a simple bathroom consisting of a:

- Toilet
- Lavatory

Multiple inspections were set up for this site, but no one showed up. Therefore, no follow-up information was found. Pictures of the current buildings are shown below in Figures 3-5.

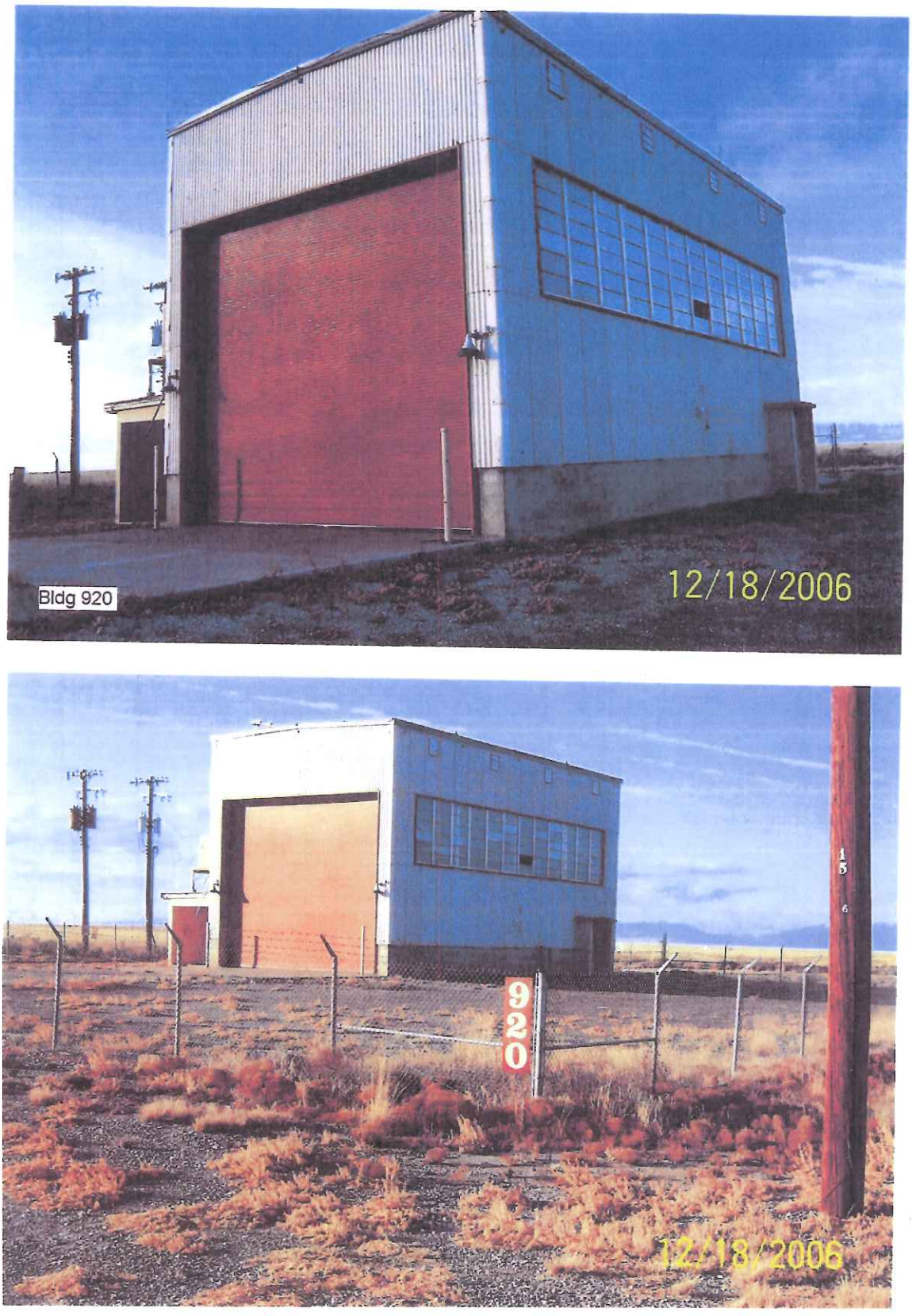


Figure 3: Pictures of Bldg. 920

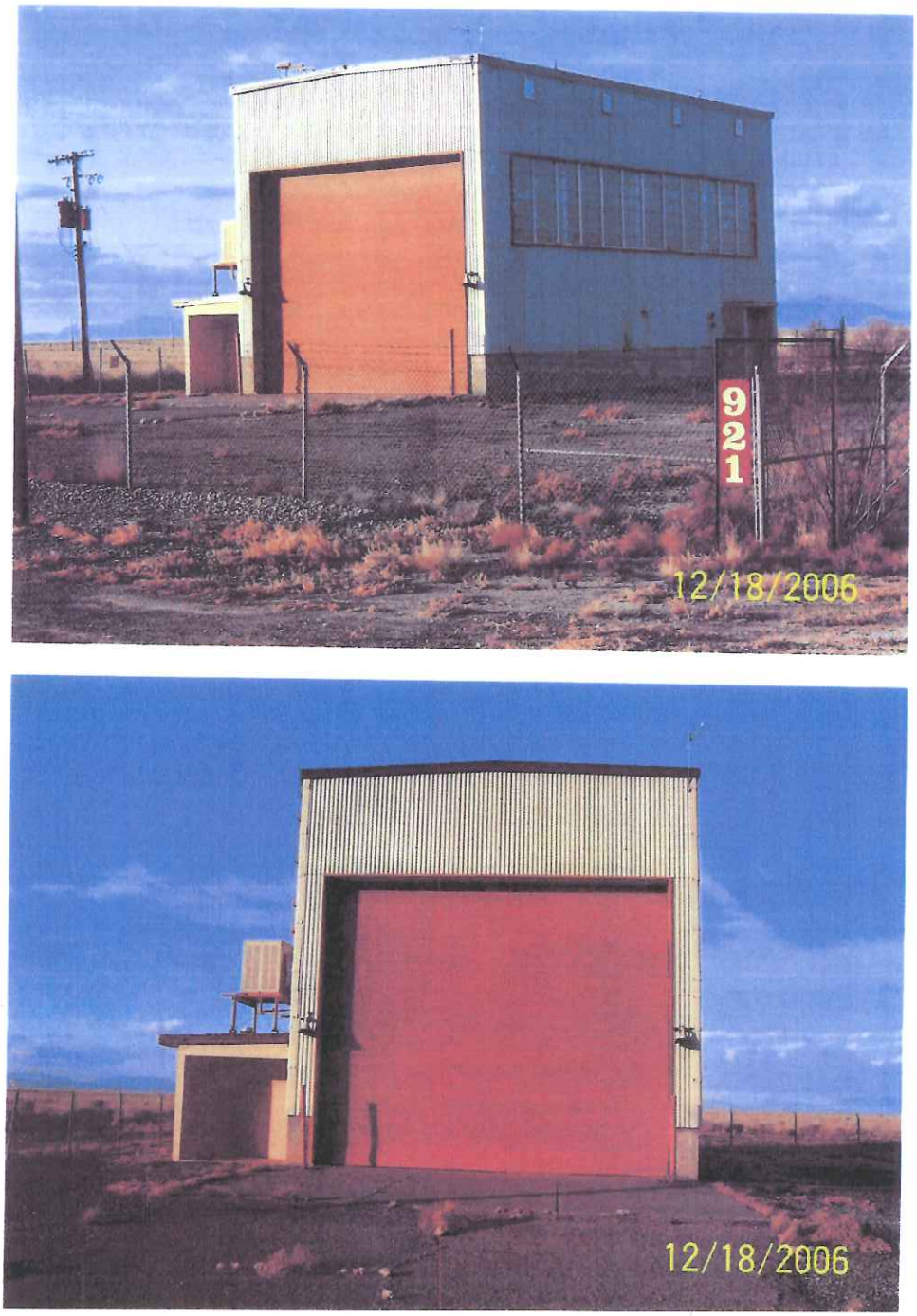


Figure 4: Pictures of Bldg. 921

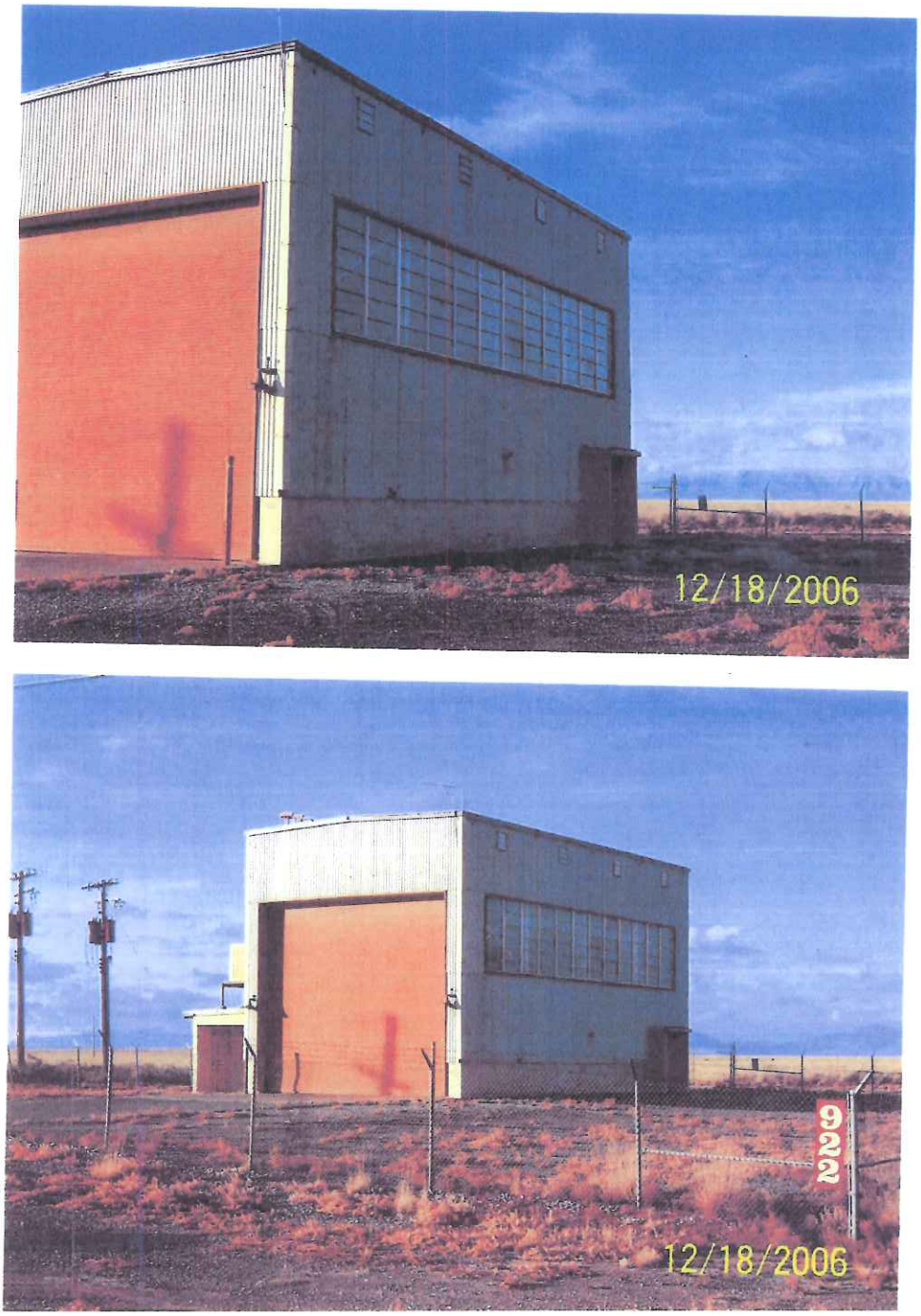


Figure 5: Pictures of Bldg. 922

INACTIVE SEPTIC SYSTEMS

BUILDING 924

This building was constructed in 1959 and has 4800 SF.
The building's original service was ammunition assembly similar to buildings 920-922.
It was later used for maintenance of radar tracking equipment.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

An on site inspection was done for this building on 20 Dec 2007 with the current facility manager, Mr. Michael Tackett. He did not have any information about the history of the septic tank system. Currently the building is being used for munitions storage. For the past two year it has stored rocket motors for the test track. From the on site inspection and drawings (Attachment 4-6) it can be seen that the bathroom drain is separate and there are no floor drains.

There are no pictures on file of this building.

INACTIVE SEPTIC SYSTEMS

BUILDING 1091

Site Description: There are no current files on this building because the building has been demolished. The building served as the Airfield Control Tower until replaced by the present Control Tower
On Attachment 55b a drawing of where the leach field was located in 1984 can be seen.
Grid Coordinates: J.9, 10.2
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: No secondary containment associated with underground storage tank
Probable Spill Route: Leakage from underground tank will contaminate water table in local vicinity

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 / UST

There were also three drawings that were discovered during the research stage of the project. The drawing (Attachment 7) shows the Septic Tank Details, Septic Tank Drain Field and the Drain Field Details.

INACTIVE SEPTIC SYSTEMS

BUILDING 1097

Specifications and history of this building are given in the following "Cold War Survey: Holloman Air Force Base". Along with this survey an on site inspection was done on 28 November 2007 with the current facility managers, A1C Clinton Bennett and TSgt Robert Edyburn. During the on site inspection it was discovered that the bathroom is separated from work area drains. In the past the building was used as a communications work center (office space) until 2005. There are no floor drains in the work area. It is currently being used as a houses base for a radio system network. There were also three drawings (Attachment 8-10) that were discovered in the investigation phase of the project. The drawings show the Materials Septic System, the Septic Tank Placement and Piping, the Latrine Plan, and the Mechanical Plumbing Plan.

Facilities in this building consist of:

- Toilet
- Urinal
- Lavatory

Description: Communications facility
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: None
Probable Spill Route: Leaks dissipate in local area on ground

Tank Location: South of facility
Fuel Flow – South/West

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 /AST
	500 gal each/ 1 /UST (Abandoned)

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Communications, Receiver.
Historic: Transmitter/Receiver.
Street Address: 1432 Sabre Road, HAFB, 88330-7842.

Building Number: 1097

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [ ] Minor [ ] Moderate [x] Major

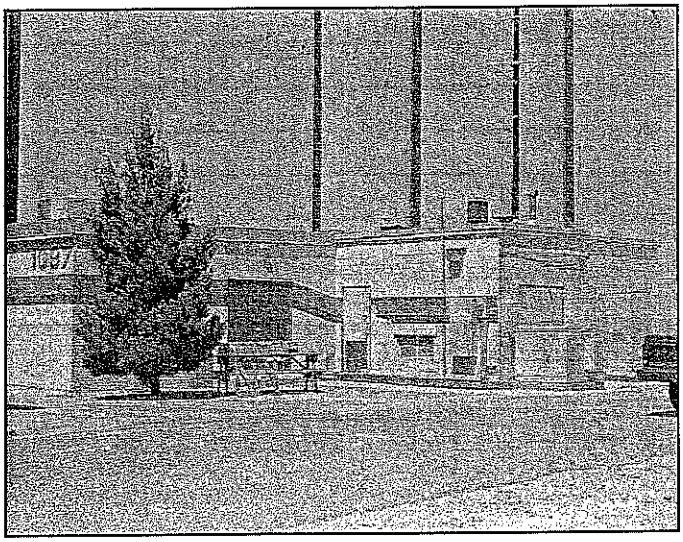
Comments:

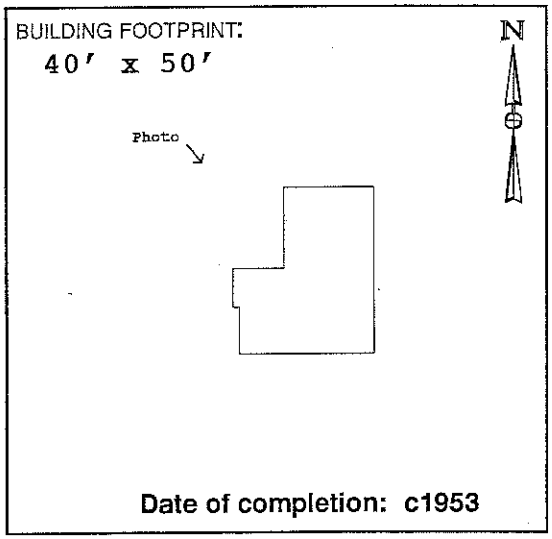
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1097 has not retained historic integrity.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1953

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1097 is a small transmitter building designed with few embellishments for utilitarian use only. Building 1097 originally had a rectangular footprint identical to Building 1098 and Building 1095. The original floor plan was sectioned into 4 rooms. An addition was constructed at the west elevation in 1986 using compatible structural and architectural components (CE File #1097-1). Both the builder and the architect are unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1097.

Current Function: Receiver/Air Traffic Control/Radio Control.

Original Function: Transmitter/Receiving/Communications.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1098-1 (c1952).

Foundation: Concrete wall footing. Concrete slab on granular fill.

Exterior walls: Painted concrete masonary units (CMU).

Roof: BUR on 2" rigid insul.; 2" poured gypsum on gyp board sup. by steel joists.

Notable interior features, including machinery:
Construction drawings document *"UHF Radio Air/Ground Facilities AN/GRC-27"*.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:
Continues to function as a communications facility/receiver site.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1097 has served as a Base communications facility since its completion c1953. Several renovations have resulted in a loss of historic integrity for this building. Building 1097 is no longer eligible for the National Register of Historic Places.

VII. ASSOCIATED BUILDINGS:

Location plan CE File #1098-2 identifies at least three north area transmitter sites. Building 1097 was associated with transmitter Building 1098. This facility is also associated with the flightline, and with communications Building 221.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building #1097 retains its original function as a radio receiver facility, however it has been modified to accommodate electrical, mechanical, and equipment additions and change-outs. Original equipment has been replaced.

Office space was added to the south elevation (1986: CE File #1097-1). All six windows at the north, east and west elevations have been blocked in. Original doors have been replaced. Vinyl floor tile covers original tile throughout. Dropped ceilings have been added.

This building, although retaining historic significance as a receiving site, has lost integrity of design, materials, workmanship, and association with its period of significance. Note: A Sgt. Boots (extension 3132) was identified by Building 1097 personnel as being a possible source for oral history research concerning specific activities associated with this facility.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Office space added to the west elevation (c1986: CE File #1097-1).

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Construction of adjacent buildings has altered viewshed.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Windows have been blocked in.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: An addition obscures the original west elevation. The original window treatments removed. Dropped ceilings added. Original asphalt floor tile covered.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: The presence of interior communications equipment and exterior poles contribute to the integrity of feeling as a radio site.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

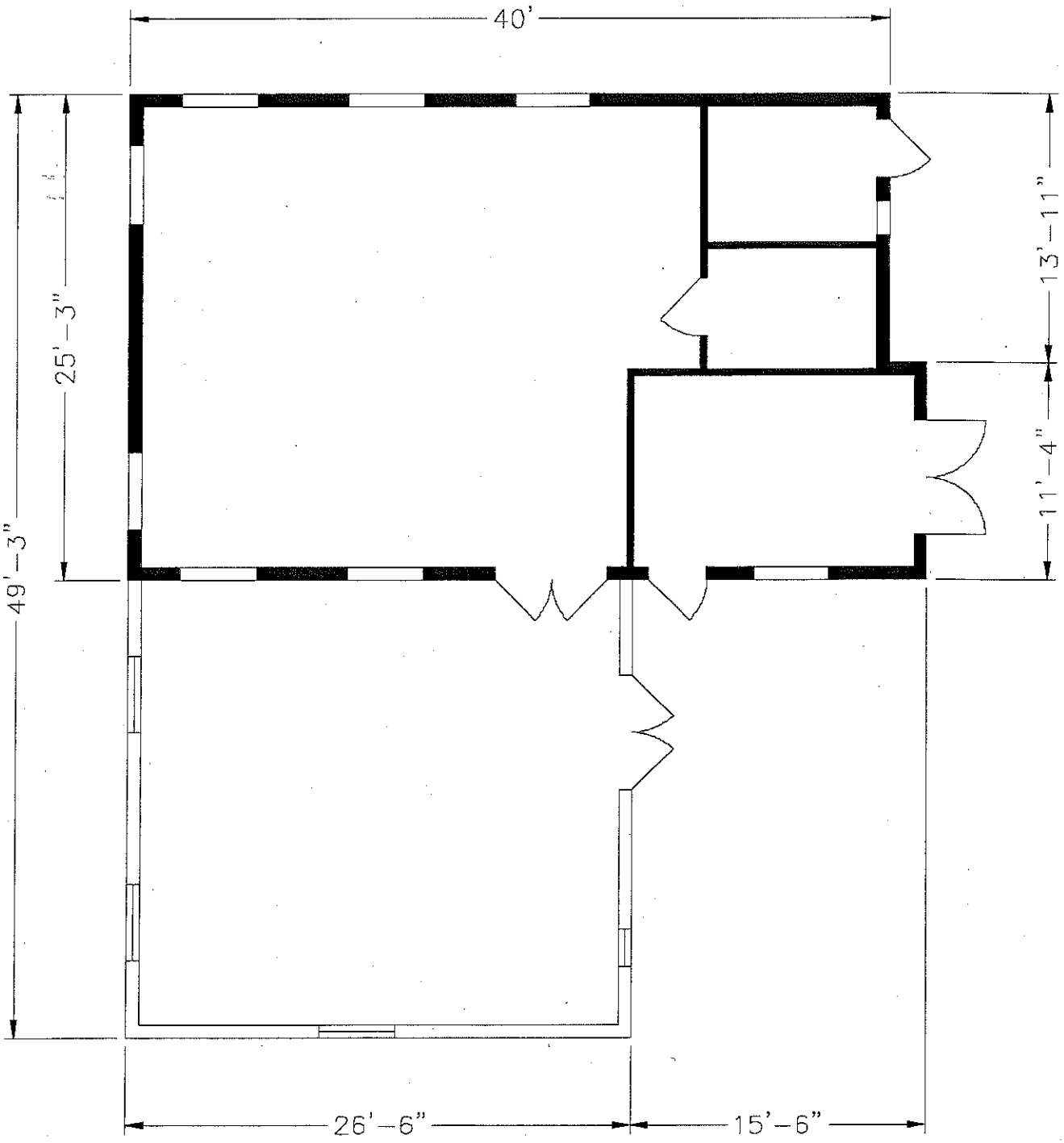
Comments: Original equipment has all been replaced.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #81**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



140

Source: CE File #1098-2 (c1971)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1097** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1190

This building was constructed in 1952 and demolished in 2002. Specifications and history are provided in the "Cold War Survey".

The only drawing discovered was the plumbing floor plan and it can be seen in Attachment 11. Attachment 55d shows the current location of the leach field in 1984.

2002 Demolished Due To Unrelated Condition

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Security Police Building.
Historic: Change House/Unconventional Fuel Storage.
Street Address: 1514 Lethal Road, HAFB, 88330-7840.

Building Number: 1190

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1190 is in need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

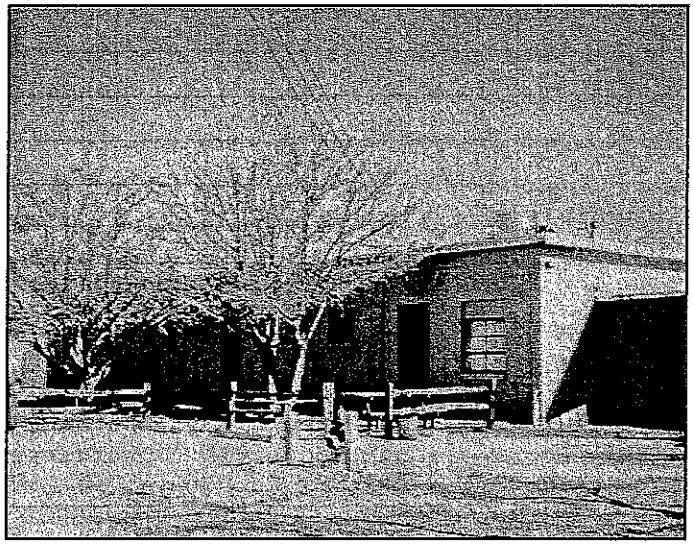
Comments: Interior partitions have been removed (date unknown).

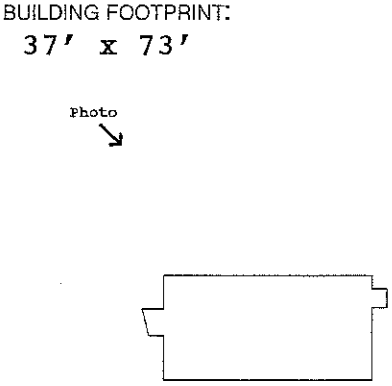
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1190 is a single-story, flat-roofed, concrete masonry unit (CMU) building exhibiting large roll-up equipment doors, numerous personnel access doors, and asymmetrical window fenestration. Construction drawings prepared in 1951 were stamped "As-built" but were not stamped in the revision block. Real Property Accountable Record/1190 indicates that Building 1190 was completed c1952 as a Change House for unconventional fuels personnel. W. C. Kruger Company (Santa Fe, NM) provided the construction drawings stored in CE File #1190. The builder is not known. A comparison of the current building and original blueprints reveals that no structural modifications to the building have occurred.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1190; CE File 1195-1 (c1951).

Current Function: Security Police operations.

Original Function: Change House, Unconventional Fuels.

Interim Functions: "RC Con House" (n.d.); "Prpln R-L Fuel/Lub" (n.d.); Prop Res Lab Rocket" (n.d.); "Prpln R-L Rkt" (n.d.); Sp Operations (n.d.).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1190-1 (c1951).

Foundation: Poured concrete footings and grade beams; concrete slab.

Exterior walls: Concrete masonry units (CMU).

Roof: (Built-up) gravel on rigid insul.; 2" slab sup. by metal lath and steel joists.

Notable interior features, including machinery: Shower stalls, locker room, dressing room, and laboratories.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

202

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Recommend reassessment of Building 1190 once the fifty-year construction date is met in the year 2002. This building retains historic integrity.

VII. ASSOCIATED BUILDINGS:

According to CE File #1190-1 *Title Sheet*, Unconventional Fuels Storage Building 1190 was associated with Building 1194 (Booster Inspection), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

This building retains all aspects of historic integrity. Although not meeting the "exceptional importance" standard imposed on buildings constructed within the last fifty years, Building 1190 remains potentially eligible as an individual property once the fifty-year date of construction is met in the year 2002. Recommend inclusion in a Multiple Property nomination along with the other unconventional fuels storage buildings. Building 1190 is currently being used as a storage and administrative facility by the 49th Squadron Security Police personnel. The original shower stalls, dressing room, locker room, shop, tools and supply rooms are all used for storage. Free-standing shelves have been installed to accommodate storage. As a result, some original doors and windows are blocked from view. Minor alterations have occurred at the interior. Two partitions have been removed. Glazed tile walls appear to have been added to at least one office. Vinyl tile has been installed over one section of the concrete slab in what once served as a machine shop. Some of the window panes have been painted. Because this facility remains potentially eligible, recommend that the original design features be considered in future modifications, and that photographs document any changes to the essential features. Suggested routine maintenance: Prune trees away from principal facade. Noticeable water damage warrants inspection of the roof. Replace broken window panes. Repair hole at exterior south elevation wall.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: Interior room layout as a Change House remains a key design element. This layout includes large open interior spaces, smaller labs/offices, and showers, dressing, and locker rooms used by unconventional fuels personnel.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Although no longer used as such, Building 1190 continues to be situated in the vicinity of other buildings historically associated with unconventional fuels testing and storage. This building appears to been recently landscaped.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two interior partitions removed. Glazed tile walls in office rather than CMU shown on original drawings.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Nearly all original workmanship remains visible, particularly at exterior.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Aside from the change in operations occurring here, Building 1190 remains essentially as it was originally constructed.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

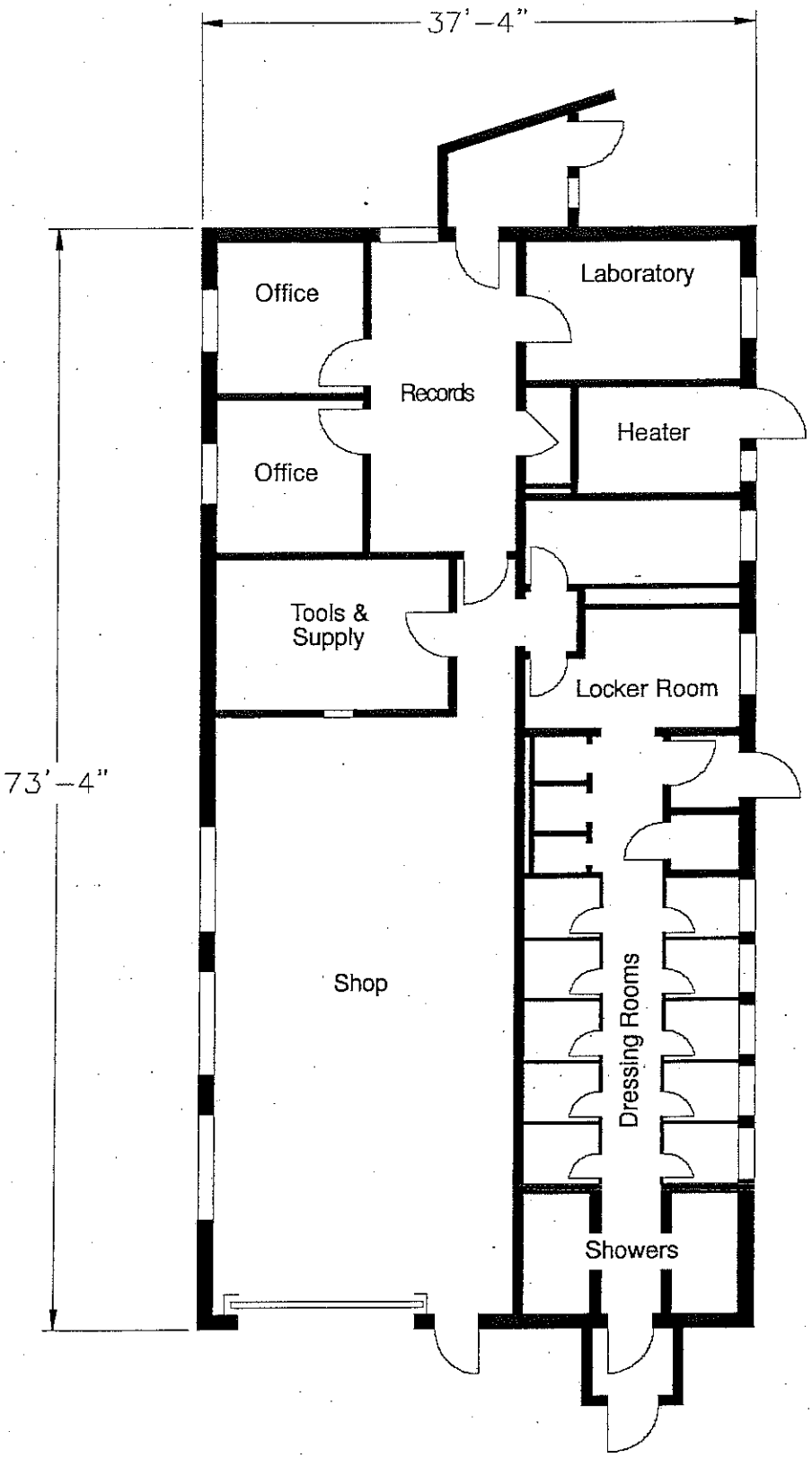
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #-Photo #**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1190-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1190** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Mike Gardner* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1194

Specifications and history are given in the "Cold War Survey".
Facilities in this building consist of:

- Toilet
- Lavatory

An on site inspection was done on 7 Jan 08 with the current facility manager, SSgt Joshua Roberts. In the inspection it was noted that the bathroom is separated from the work area drain. There was no history known. The building is currently being used for storage and it has been used for storage and has been used for storage for the past ten years.
Attachment 55d shows where the leach field for Bldg.1194 was located in 1984.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME: **Building Number:**

Current: Research Equipment Storage.

Historic: Booster Inspection/Unconventional Fuel.

Street Address: 1584 Lethal Rd., HAFB, 88330-7840. **1194**

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1194 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

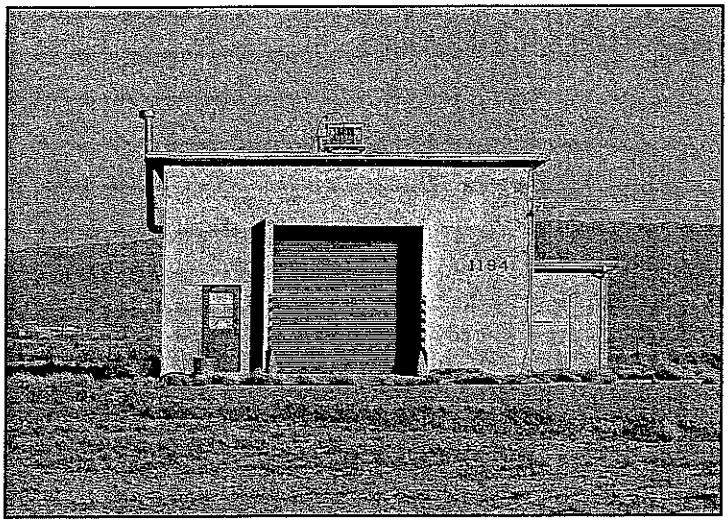
Comments: Interior partitioning is reversible.

Preliminary Determination of National or State Register Eligibility:

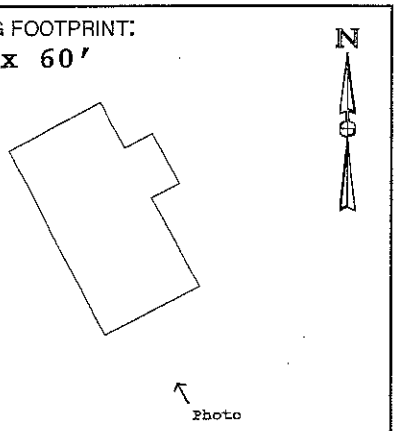
[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.



BUILDING FOOTPRINT:
30' x 60'



Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1194 is a rectangular, single-story, high bay structure made of concrete masonry units (CMU) and exhibiting a flat roof. The principal elevation faces west, showing one large roll-up door, and one personnel door. One row of windows is located below the eave line at the north and south elevations. The ceiling at the interior is exposed. "As-built" construction drawings show that Building 1194 was completed in 1952. W. C. Kruger Co. (Santa Fe, NM) provided the architectural work (1952: CE File 1194). The builder is unknown. No structural modifications to the original structure were noted.

III. HISTORIC AND CURRENT USE:

Current Function: Research equipment storage.

Original Function: Missile Assembly Test Building/Booster Inspection.

Interim Functions: "Mls/Space Rsch Tst" (n.d.); "M/Assembly Test Bldg" (n.d.); "Shp Wpn and Rlse Sys" (c1976); "BE Stor Cv Fclty" (n.d.); "Rsch Equip Stor" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1195-1 (c1952).

Foundation: Poured concrete footings and stem wall. Slab on compacted fill.

Exterior walls: CMU between concrete columns and bond beams.

Roof: BUR gravel. Rigid insulation. 2" concrete deck supported by steel joists.

Notable interior features, including machinery:

4-ton Wright Company chain-operated crane and hoist system, hoist no. 5197, serial no. 4925. The hoist is attached to a runway "I"-beam (crane) supported by steel support beams. Large metal roll-up doors at east and west elevations.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

210

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1194, although not meeting the "exceptional importance" standard, may be eligible for the National Register for its role in early Cold War materiel development once the fifty-year construction date is met in 2002.

VII. ASSOCIATED BUILDINGS:

According to CE File #1195-1 (c1951) *Title Sheet*, Building 1194 was associated with Building 1190 (Change House), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1194 remains essentially as it was constructed c1952. The original floor plan layout included one main room and an equipment room. A small area in the northwest corner of the main room has been partitioned. No documentation was found pertaining to this modification. This minor partitioning of the main room is reversible. This building is no longer associated with either missile assembly and test activities or unconventional fuels storage, and currently serves as an equipment storage room for the 6585th Test Group. Construction drawings (1956: CE File # 1194-1) show that an addition to this building was planned. There is no indication that this addition was ever built. Because this building retains historic integrity, and may be eligible for the National Register under Criteria A and/or C once the 50-year construction date is reached in the year 2002, recommend that future modifications take essential design features into account. Note: One isolated occurrence of prehistoric artifacts was noted on the grounds north of the building, including one white chert core, and one secondary chert flake.

Suggested routine maintenance: Scrape, prime, and paint the exterior. Replace downspouts. Prune landscape plantings away from foundation.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Construction drawings show plans for an addition to the north elevation (1956: CE File #1194-1). There is no evidence that this addition was ever built.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The high open-bay floor plan allowing the crane and hoist system, and the large metal equipment roll-up doors remain as key design elements.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Buildings 1193 and 1194 remain in an unmodified and isolated setting.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Nearly all of the historic materials used to construct this building remain visible.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two doors have been replaced. All windows appear to be original. Interior partitions at the northwest corner divide the original floor plan.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Although retaining its original open floor plan, this building is currently used for storage of modern equipment.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

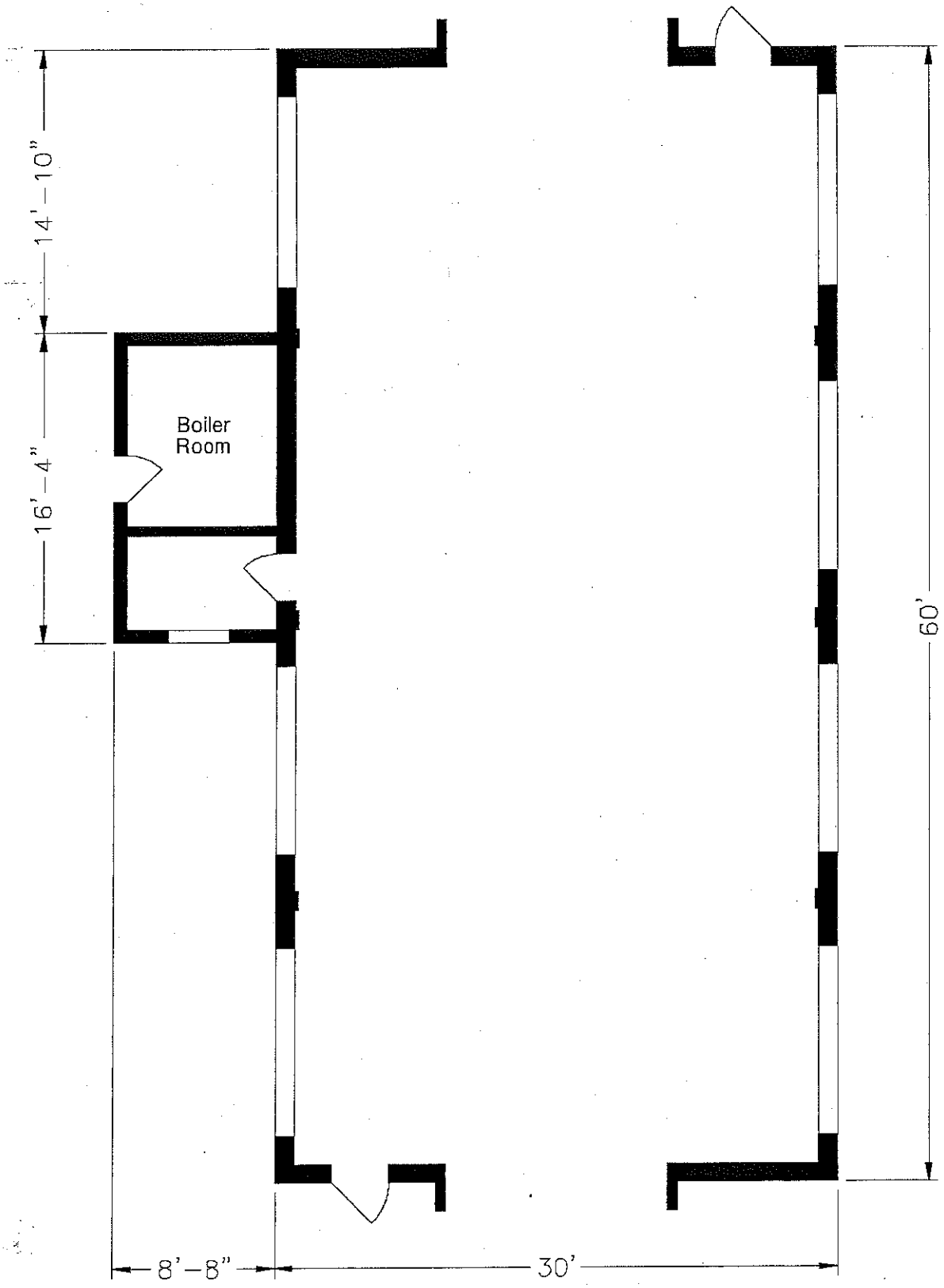
Comments: The open floor plan, isolated setting, hoist system, and nearby continuity check stand (Building 1193) contribute to this building's integrity of association.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #3-Photo #31**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1195-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1194** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1196

This building was constructed in 1956. It originally built for missile assembly, but is now in communications equipment storage.
The original facilities consisted of:

- Toilet
- Lavatory

These facilities were replaced in 1975 with:

- Toilet
- Urinal
- Lavatory

An on site inspection for this building was done on 4 Dec 07 with the current facility manager Sgt Lander. The information gathered from this inspection was that there were not any floor drains located within the building. In the past it was used for TAC can and for the past ten years it has been used for storage.
Attachment 55d shows where the leach field for Bldg. 1196 was located in 1984.

Figure 6: Picture of Bldg. 1196

INACTIVE SEPTIC SYSTEMS

BUILDING 1199

This building was constructed in 1957. It was originally built as a rocket fuel laboratory. In 1987 it was converted to the Security Forces Kennel.
As the fuels laboratory, it contained:

- Toilet
- Urinal
- Lavatory
- Shower

After conversion to the kennel, the facilities were changed to:

- Toilet
- Urinal
- Stainless Steel Sink

During the investigation stage of the project there were drawings found for building 1199. Attachment 12 and 13 are of the Site Plan, the Sewer Isometric, the Plumbing Plan and the Floor Plan.

Along with the drawings that were found an on site inspection was completed on 29 Nov 07 with the current facility manager, SSgt Gilmore. A new Security Forces Kennel area has been built and now the building is currently being used to house animals until they can be transferred to Alamogordo Animal Control.

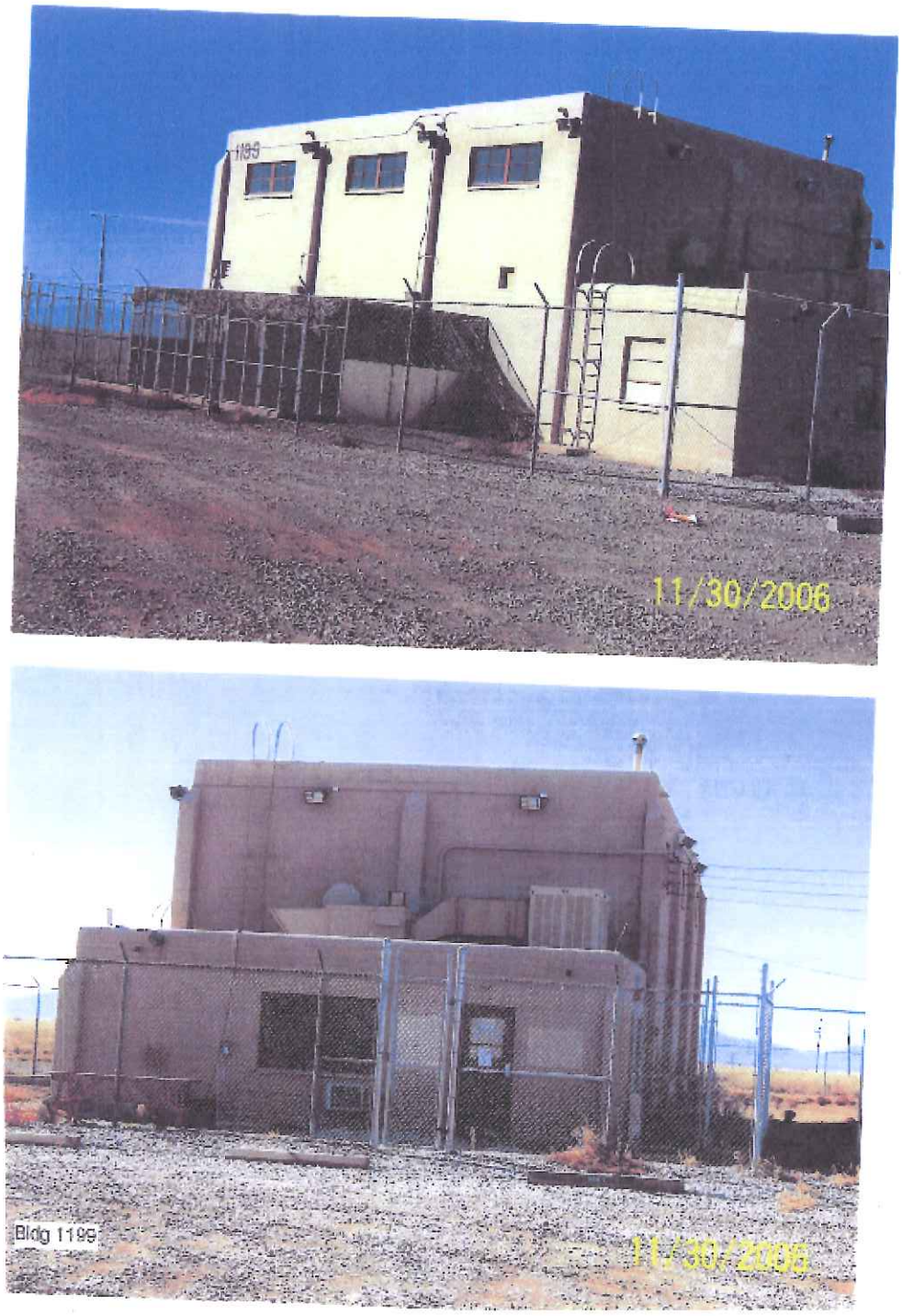


Figure 7: Pictures of Bldg 1199

INACTIVE SEPTIC SYSTEMS

BUILDING 1200

Specifications and History: See "Cold War Survey".

Three drawings were found for this building. These drawings show the Plumbing Floor Plan (Attachment 14), a Floor Plan (Attachment 15) and the Septic Tank and Drain Field (Attachment 16).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab, Medical (VACANT).
Historic: Space Biology Laboratory.
Street Address: 841 Douglas Road, HAFB, 88330-7823.

Building Number: 1200

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [ ] Needs maintenance [x] Deteriorated [ ] Archaeological

Comments: Building 1200 is abandoned, and showing signs of deterioration.

Degree of Alteration: [ ] None [ ] Minor [x] Moderate [ ] Major

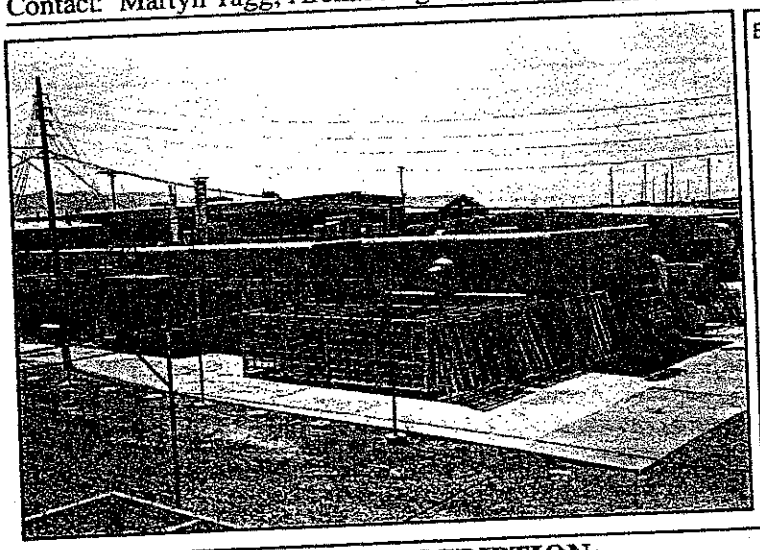
Comments: Alterations are architectural rather than structural.

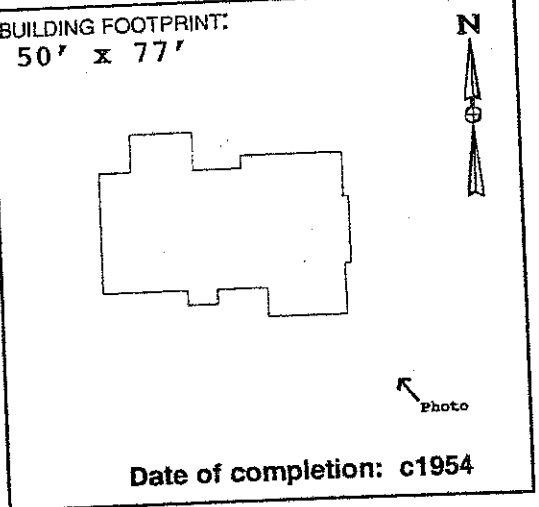
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1200 no longer retains historic integrity. See Section VI.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1954

273

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1200 is a rectangular, single-story, flat-roofed concrete masonry unit (CMU) building constructed as one of several laboratories dedicated to important aeromedical research using both animals and humans. None of the construction drawings were correctly stamped "As-built." According to Real Property Accountable Record/1200, the estimated date of construction is 1954. Subsequent improvements documented in CE File drawer #1200 include an addition to the medical lab (c1958), a covered passageway added to the boiler room (c1957), and a frame wall addition to the surgery room (c1957). Neither the builder nor the architect is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1200; Field visit Summer 1995.

Current Function: Vacant.

Original Function: Space Biology laboratory/Animal experimentation.

Interim Functions: Animal experimentation/Storage.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1200-1 (c1953).

Foundation: Concrete wall footings. Concrete slab on fill.

Exterior walls: Painted concrete masonry units (CMU).

Roof: BUR on concrete deck, supported by metal lathe and steel bar joists.

Notable interior features, including machinery:

Originally used as a medical laboratory, with work tables, work benches, built-in lockers, cabinets, operating tables, x-ray tables, etc.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:

274

One room is currently being used for storage. All medical and laboratory equipment has been removed.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Due to extensive alterations to the exterior, Building 1200 no longer retains historic integrity. Recommend, however, that this building be considered as a contributing feature in a basewide early Cold War National Register of Historic Places Multiple Property nomination.

VII. ASSOCIATED BUILDINGS:

Building 1200 was an integral part of Holloman's aeromedical facilities, including Buildings 1201, 1202, 1203, 1204, 1205, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Since its original construction c1954, Building 1200 has been used as a laboratory and medical facility for a wide variety of research animals, including trout, black bear, dogs, mice, and chimpanzees. Although currently abandoned, this building featured a lead-lined x-ray room, an autopsy room, an observation room, a surgery room, a dark room, and animal pens (c1954: CE File #1200-1). Built-in steel lockers, metal cages, x-ray tables, work benches, food bins, operating tables, scrub sinks, surgical lamps, sterilizers, etc. have been removed. Two exterior doors have been blocked in, and thirteen exterior windows have been blocked in. One exterior door and one exterior window have been added. Interior walls have been added, removed, or relocated. A storage room has been added to the south elevation. Animal cages remain at the west elevation. The presence of dead rodents, foul odors, torn pipe and duct insulation (possible containing asbestos) and peeling paint (possible lead-based) represent hazards to health and safety. Because of the unique and important nature of the research conducted here, recommend that this building be nominated as a contributing feature as part of an HAFB early Cold War National Register Multiple Property nomination.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?
[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.
Comments: The building has been located at its present location since c1954.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?
[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact
Comments: Most of the original doors and windows have been removed. All of the equipment has been removed. Most of the original finishes have been obscured.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting
To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting
Comments: Continues to be situated in an isolated setting with the other Aeromedical facilities.

Materials: To what extent have the original materials used to construct this structure been retained?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Elevations have changed due to modified openings, an addition, and a covered passageway. Interior wainscot and cornice removed, wall tile added.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Exterior walls and cages remain intact. Some architectural features remain. Most of the original interior workmanship has been lost.

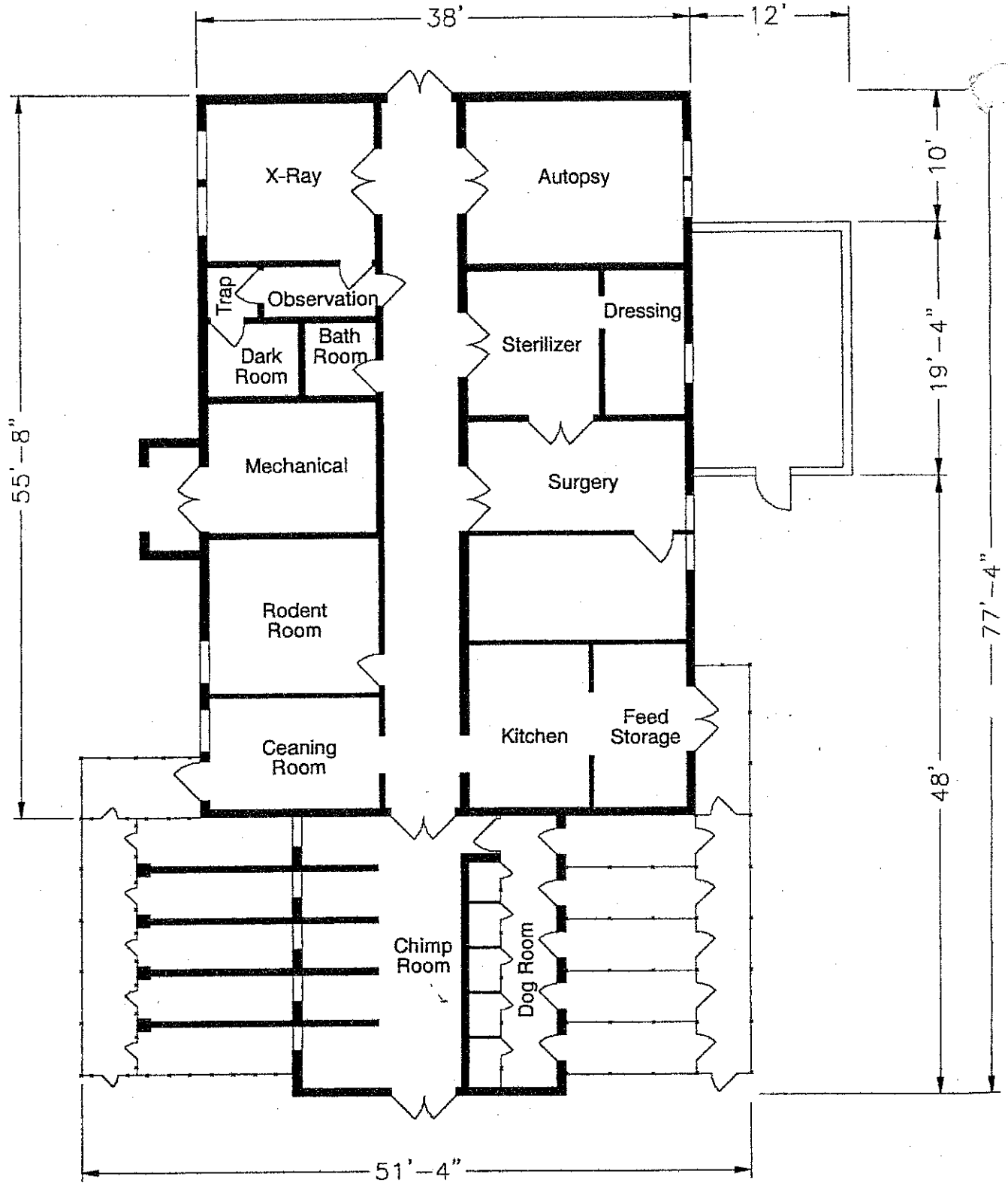
Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?
[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity
Comments: Building 1200 continues to be situated within the compound set aside for animal research. Chimpanzee research continues today in nearby buildings.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?
[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity
Comments: Although all of the equipment has been removed, this building still demonstrates a link with its past by virtue of its setting, the odors, and the animal cages.

X. FURTHER INFORMATION:

Surveyed By:
Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #94**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1200-1 (c1954)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1200** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

BUILDING 1201

Specifications and History: See "Cold War Survey"

Seven drawings were found for this building. These drawings show the Septic Tank and Absorbent Area Layout, Isometric Sewer Layout, Septic Tank Plan and Septic Tank Elevation (Attachment 17), Floor Plan (Attachment 18), Layout Plan (Attachment 19) and Systematic-Waste System (Attachment 20).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab Medical.
Historic: Aero. Medical Field Lab.
Street Address: 821 Douglas Road, HAFB, 88330-7823.

Building Number: 1201

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Structurally intact. In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

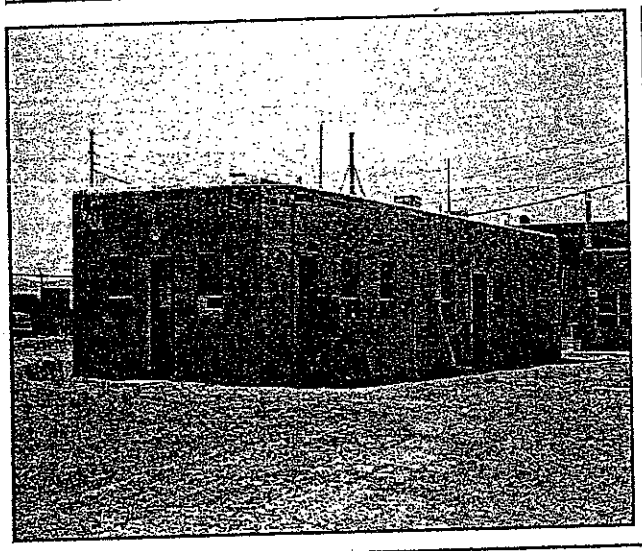
Comments: Mortuary/autopsy room added as subsequent improvement c1958.

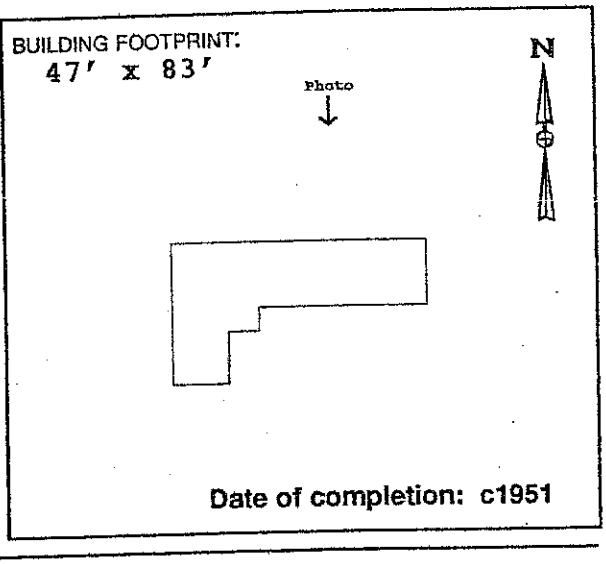
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible under Criteria A and/or C at a national level.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1951

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1201 is an "L-shaped", single-story, flat-roofed, building constructed primarily using painted 8" structural clay tile and exhibiting asymmetrical door and window placement. Animal cages occupy the west elevation. Real Property Accountable Record/1201 indicates that this science laboratory was constructed c1951. The construction drawings consulted were stamped "As-Built," although no date was given. Both the architect and builder are unknown.

At least two structural modifications may be viewed as subsequent improvements to the original building, including the addition of a Mortuary/ Autopsy Room (c1958: CE File #1201-4), and the addition of a rooftop observation deck (c1952: CE File #1201-5).

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1201.

Current Function: Carpentry shop; Employee break room; Office space.

Original Function: Aerospace Medical Lab; Animal experimentation.

Interim Functions: "SC Lab Human Eng" (n.d.); "SC Lab Med (c1968).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1201-1 (c1951).

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted structural clay tile.

Roof: Built-up roof w/ gravel on sheeting, supported by 2x12 wood joists.

Notable interior features, including machinery:

Fixed chain link cages, lab tables, equipment tables, work tables, wood storage bins, sterilizer, incubator.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL: (Based on field visit Summer 1995

[c1958 SUBSEQUENT IMPROVEMENT--MORTUARY/AUTOPSY]:

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted cement masonry unit (CMU).

Roof: 5-Ply built up roof on concrete slab. Steel joists.

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Notable interior features, including machinery:

Washer and dryer, kitchenette, tool room, table saw, furniture, lockers.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1201 is eligible to the National Register under Criteria A and/or C at a national level of significance for its vital role in early aeromedical research in support of the early Cold War space exploration mission.

VII. ASSOCIATED BUILDINGS:

Building 1201 was associated with the other Aeromedical facilities, including Buildings 1200, 1202, 1203, 1204, 1205, 1206, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1201 retains historic integrity as far as the structure itself goes. Very little physical evidence remains of this structure's original use as an animal laboratory. The cages have been removed. Two interior walls with doors have been added. One interior wall has been removed. Service sinks, work tables, wooden bins, an incubator, and other lab support items shown on c1951 construction drawings have been removed. An area of the original roof approx. 10' x 13' was reinforced with three inches of concrete for observation deck c1952 (CE File #1201-5). A mortuary/autopsy room was added c1958. These additions may be viewed as early improvements, and do not diminish Building 1201's historic integrity. Drawings itemize a "2-body" mortuary room, an autopsy table, a band saw, cabinets, a sterilizer, a photography area, and other laboratory equipment. This equipment has been removed. This room currently serves as a lounge area for employees. Due to the important research conducted here in support of this nation's space program, further research is warranted. Recommend that Building 1201 be included in a Cold War-era Multiple Property nomination. Suggested routine maintenance: This building is showing the signs of long-term neglect. Fill the stress cracks at the exterior corners. Scrape and paint exterior walls. Replace window glass and door hardware as needed.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Continues to be situated in an isolated compound.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Original structure essentially intact. Interior lab equipment and cages removed.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Enclosed by chain link fence topped with barbed wire, along with other research facilities. Chimpanzee research continues in nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Clay tile walls still intact. Some glass block windows remain. Some glass block windows blocked in when addition constructed. Floor tiles removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Roof, walls, and exterior openings remain essentially the same. The east elevation changed due to an early addition. Interior partitions, openings, and finishes have changed.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Historic photographs show that the natural, historic, and aesthetic character of Building 1201 has been retained.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

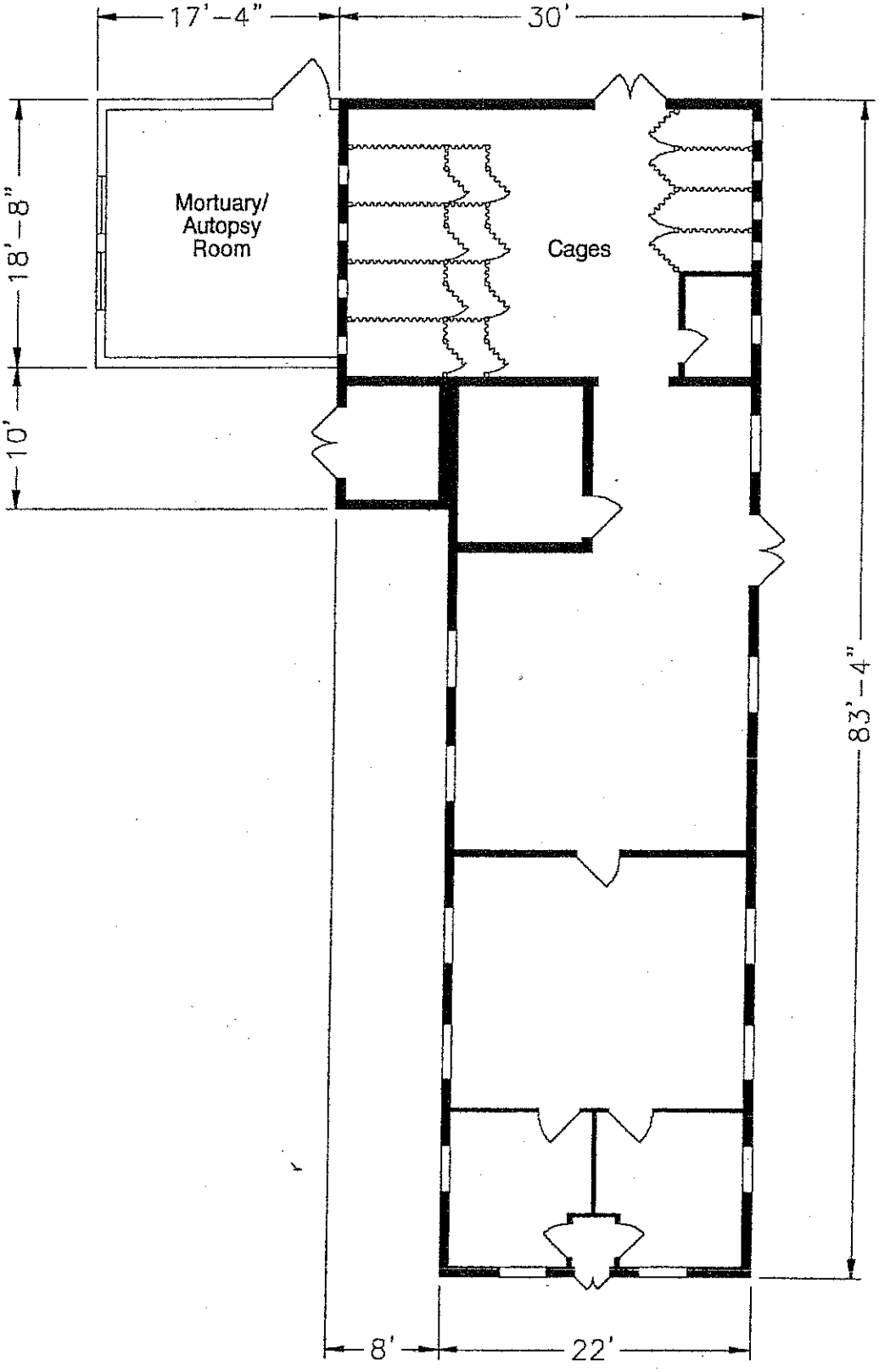
Comments: Building 1201 retains a visible link with its period of significance.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #91**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1995**



280

Source: CE File #1201-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1201** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

Buildings 1219, 1221, 1235 and 1239
An on site inspection was completed on 20 Dec 07 with the current facilities manager, TSgt Pote, he has been the facilities manager for the past nine years. During the inspection it was discovered that there are sink holes on all leach fields in the compound. All buildings in this compound have separate drains for the bathrooms. All buildings are also currently connect to the base sewer system.
Attachment 55d shows the leach field location for Buildings 1219, 1221, 1235 and 1239.

BUILDING 1219

This building is the Administrative Offices for the Munitions Maintenance Squadron. It was constructed in 1985 and covers 4476 SF.
There are Men's and Women's Bathrooms that discharged into two (2) septic tanks prior to the installation of a sewer main that discharges to the Base Waste Water Treatment Plant.

INACTIVE SEPTIC SYSTEMS

Building 1221

This building is in the Ammo Depot and was originally constructed for ammunition storage. It was later switched to store inert munitions.
The building was constructed in 1983 and covers 2857 SF.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan (Attachment 21), Floor Plan (Attachment 22), Partial Plan (Attachment 23), Septic Tank Details and Sewage Disposal System (Attachment 24) and a Profile of Sewer Line Septic Tank and Disposal Field (Attachment 25).

INACTIVE SEPTIC SYSTEMS

BUILDING 1226

This is a munitions maintenance shop building constructed in 1985. It has 2945 SF of floor space.
Facilities installed include:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Utilities Plan (Attachment 26), Plumbing Demolition Plan (Attachment 27), Plumbing and HVAC Plan (Attachment 28) and Waster/Water Piping Detail (Attachment 29).

In Figure 8 on the following page it can clearly be seen where the leach field is in relation to where building 1226. This is the leach field for building 1219, 1221, 1235 and 1239 as well. In Attachment 46 (a map showing many of the building on Holloman AFB) it can be seen where building 1226 is in relation to these building.

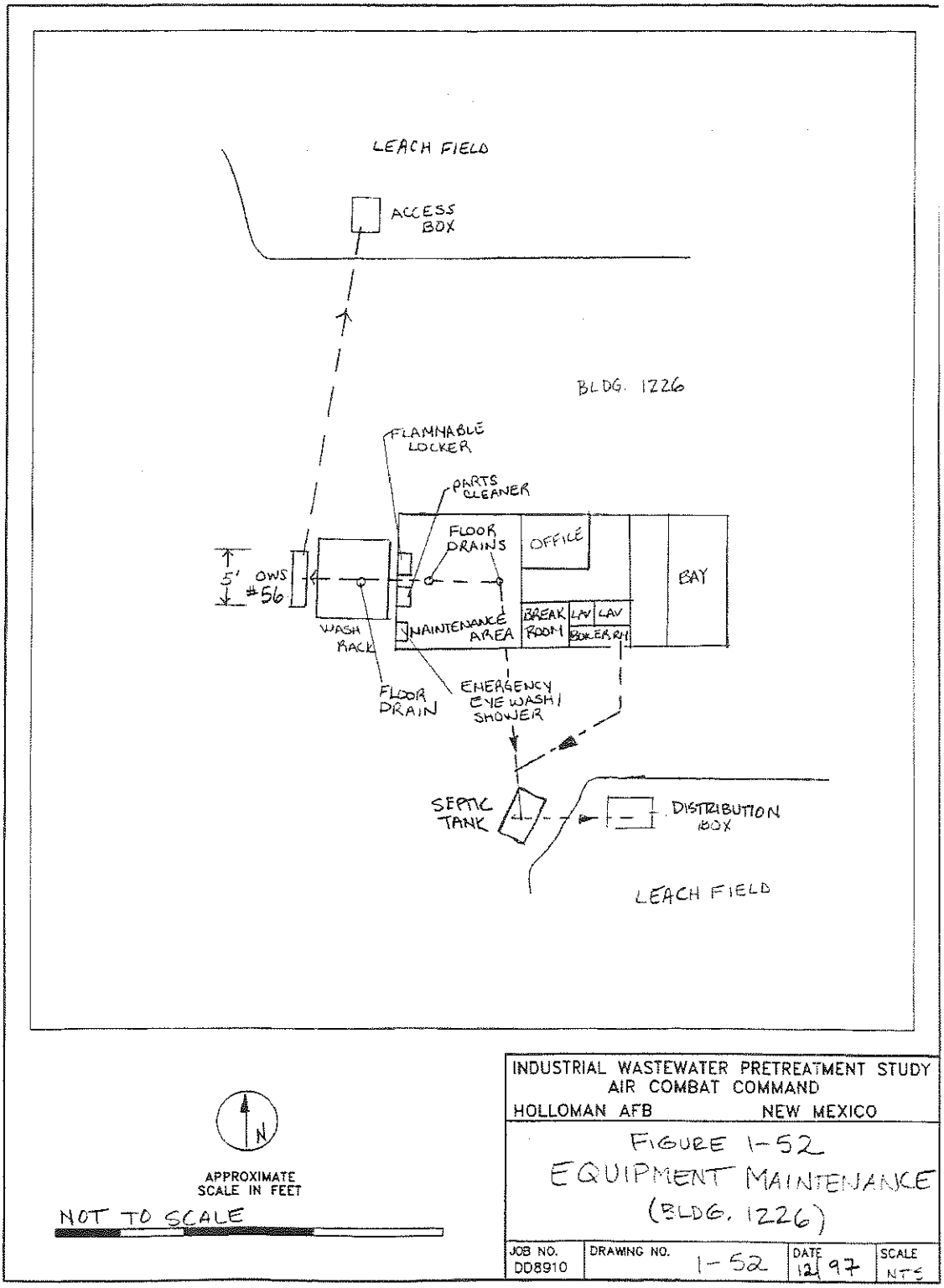


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Figure 8: Drawing of Leach field

INACTIVE SEPTIC SYSTEMS

BUILDING 1235

This building was constructed in 1964 and contains 3000 SF of floor space.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, a drawing for this building was also located. This drawing (Attachment 30) shows the Site Plan, Septic Tank Details and Sewer Clean Out.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST

INACTIVE SEPTIC SYSTEMS

BUILDING 1239

This is another building in the Ammo Depot. It was constructed in 1971 and contains 1920 SF.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Urinal
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan, Septic Tank Details, Utility Plan (Attachment 31), Floor Plan (Attachment 32), Grading Plan (Attachment 33) and Lavatory Detail (Attachment 34).

INACTIVE SEPTIC SYSTEMS

BUILDING 1250

This building was constructed in 1957 and contains 2890 SF.
It was originally a water pumping station. In 1985 it was changed into a storage facility. As part of the change in service the bathroom facilities were removed. Currently it has a large infestation of vectors and it is unsafe to go inside. The POC for this building is Mr. Chuck Price.
The original facilities consisted of:

- Toilet
- Lavatory
- Floor drains for the water pumps

INACTIVE SEPTIC SYSTEMS

BUILDING 1251

This building was constructed in 1965 and contains 1300 SF.
In the records it is listed as a Research and Testing Shop. It currently has a large infestation of vectors, therefore it is not safe to go inside. The building has been vacant since the mid 90's. The point of contact for this building is Mrs. Eisele.
It contains the following facilities:

- Toilet
- Lavatory

INACTIVE SEPTIC SYSTEMS

BUILDING 1269

This building was constructed in 1966 and contains 3262 SF.
The original service was a Medical Science Laboratory. It has been relegated to a storage facility.
The facilities consisted of:

- Toilet
- Lavatory
- Kitchen Sink with Garbage Disposal

Site Specific Contingency Plan: See Attachment 1

Max. Spill Quantity (gal): 55

Chemical	Container Type
Benzene	NA
Acetonitrile	

REMOVED SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	1102	1952	6'x4'x8'10"	2500
2	1103	1948	7'x9'x3'2"	1412
3	1108	1958	6'x9'6"x6'3"	750
4	1119			
5	1150	1953	4'x9'x6'3"	2500
6	1154			
7	1166	1960		450
8	1175	1949	5'1"x10'4"x6'10"	2970
9	1176	1959		640
10	1265	1992		1200
11	1173			

REMOVED SEPTIC SYSTEMS

BUILDING 1102

Specifications and History: See "Cold War Survey." More information can be seen in the drawings. The drawings that have been found for this building are as follows the Grading Plan (Attachment 35), Septic Tank Details and Boring Log Results (Attachment 36), Leaching Well and Cover Details and Sewer Clean Out (Attachment 37).

Attachment 55c shows where the leach field was located for this building in 1984.

This building has the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Missile Radar Station.
Historic: Radar Triangulation: King I.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1102

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

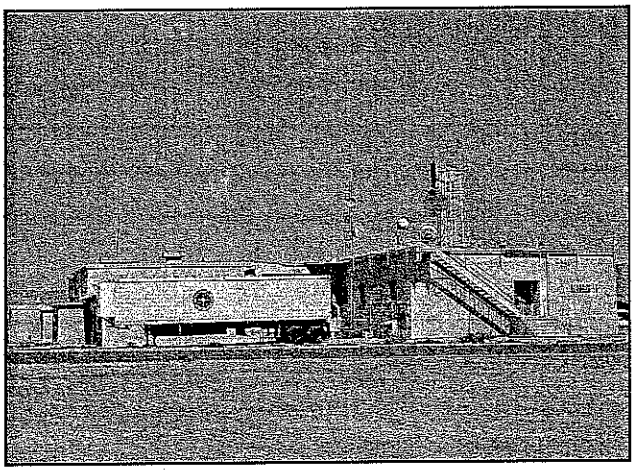
Comments: Essential structural and architectural features remain intact.

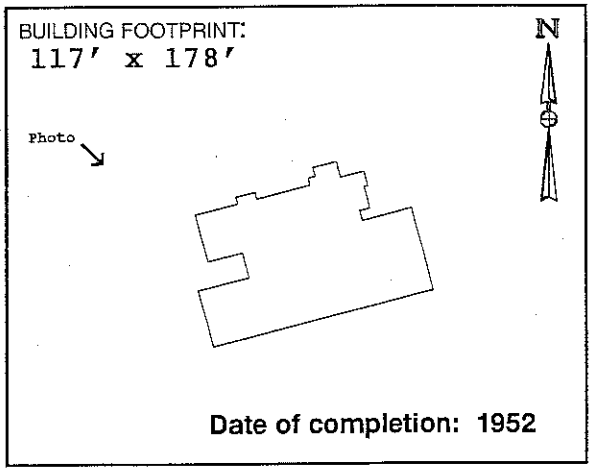
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Recommend listing as part of a Cold War Multiple Property.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1102 is a one-story concrete masonry unit, multi-shaped building with a central corridor running east-west the entire length and single rooms flanking both sides of the corridor. Original footprint shows primarily rectangular shape with a central projecting core. This core is a large open room with an upper balcony around its perimeter. Construction of the original building was completed in 1952, according to "As-built" drawings in CE File #1102-1. Surveillance display room added in 1969 (CE File #1102-1). It is unclear when north elevation additions constructed, although information in Real Property Accountable Record/1102 date the additions as being post-1970. The architect for this project was W. C. Kruger (Santa Fe, NM). The builder is unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1102.

Current Function: Telemetry and Optics. Altitude measurements.

Original Function: Missile Instrumentation Station; Mission Control.

Interim Functions: Missile Radar Station.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1102-1 (c1952).

Foundation: Concrete footing and foundation wall. Column spread footing.

Exterior walls: Concrete masonry units (CMU).

Roof: Bituminous concrete over built-up roof, ltweight concrete, supported by one-way concrete slab using concrete beams and steel beams encased in concrete.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

380

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Eligible under Criteria A and/or C at a national level of significance for important role in early Cold War-era missile and High Speed Test Track mission control and tracking. Further research recommended.

VII. ASSOCIATED BUILDINGS:

Building 1102 supported all missions at White Sands Missile Range and at Holloman Air Force Base until Building 300 and possibly 1527 at White Sands were constructed.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1102 continues to operate as a mission control building, with mostly optics and telemetry functions. The Flight and Instrument Control Room, and the Surveillance Radar rooms are vacant. Originally, missiles were fired using an analog boards (mechanical) system. When operations changed to a digital system in c1978, support moved from the central instrument control room to the north addition off of this room. Nearly all of the original interior finishes remain unchanged.

Suggested routine maintenance: Scrape, prime, and paint all block and concrete surfaces. Remove vegetation and rusted pipes by gas meter. Fill depressions at foundation, and regrade using gravel to promote positive drainage. Fill holes at concrete stoops. Replace wood bumper at dock using similar-sized lumber. Secure panel covers on abandoned electrical panels. Enclose live connections in junction boxes. Scrape, prime, and paint metal stairs. Reattach stair nose treads. Remove miscellaneous debris from building perimeter.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Still situated at the northeast corner of the intersection of Tula Peak Road, and Douglas Road.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The original floor plan remains intact.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Continues to be situated at the intersection of two roads in an isolated setting with few nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Most all original materials have been retained at both the exterior and the interior.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: All original exterior and interior room finishes remain visible. At the south elevation, one window is blocked, one window has been replaced with a door, and the door at the loading dock has been replaced. Most of the north elevation is obscured by the addition of an operations room.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1102 continues to support limited mission control operations.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

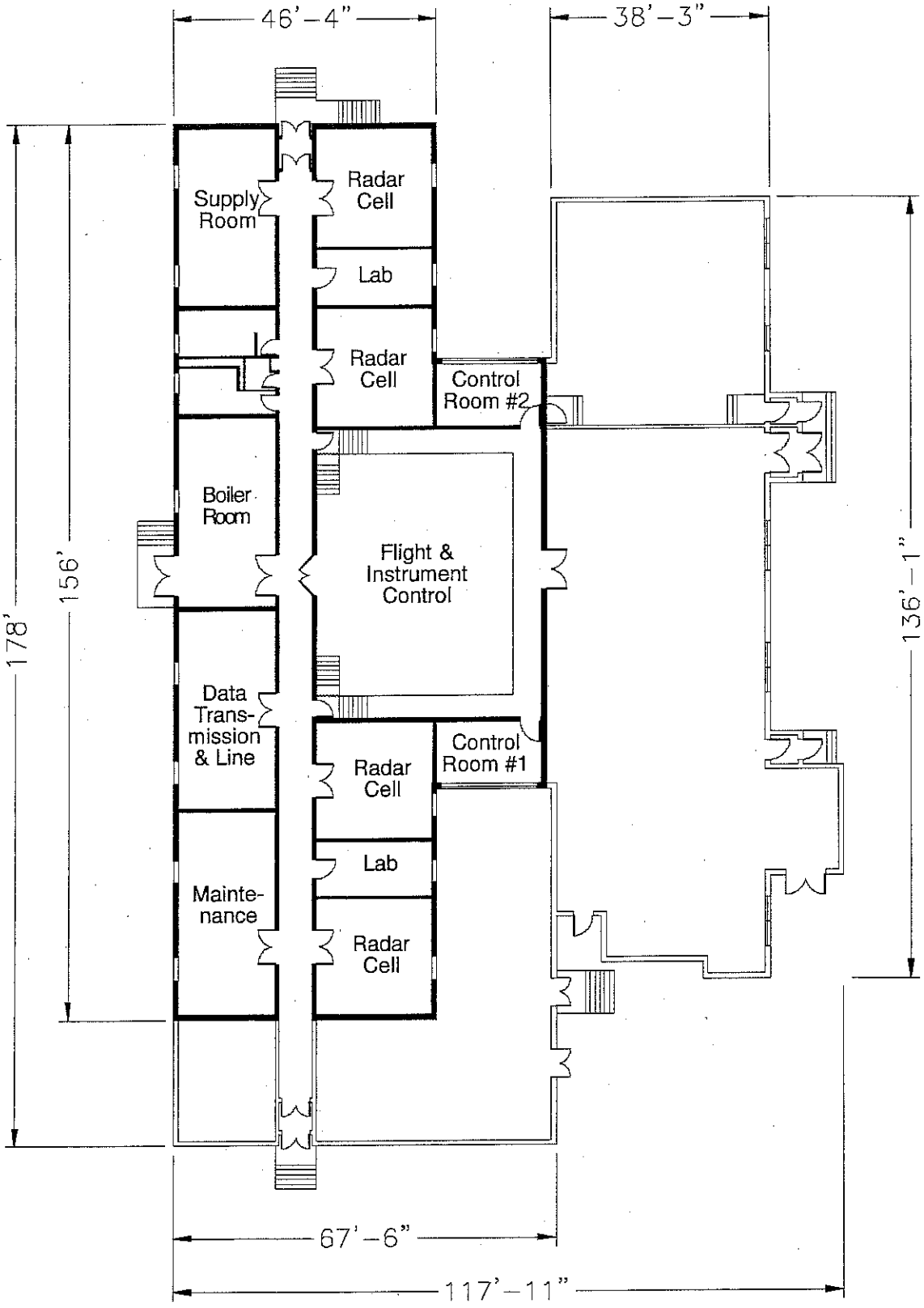
Comments: Building 1102 retains an evident link with its aesthetic and functional historic character.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #49**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1102-1 (c1952)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1102** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-6401* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1103

Specifications and History: See "Cold War Survey" the Layout Plan (Attachment 38) has also been provided.

Attachment 55c shows where the leach field was located for this building in 1984.

Facilities: This building contains the following facilities.

- Tiolets-2
- Urinals-2
- Lavatories-3
- Service Sinks-3

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Timing.
Historic: Telemetering Building.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1103

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance only.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

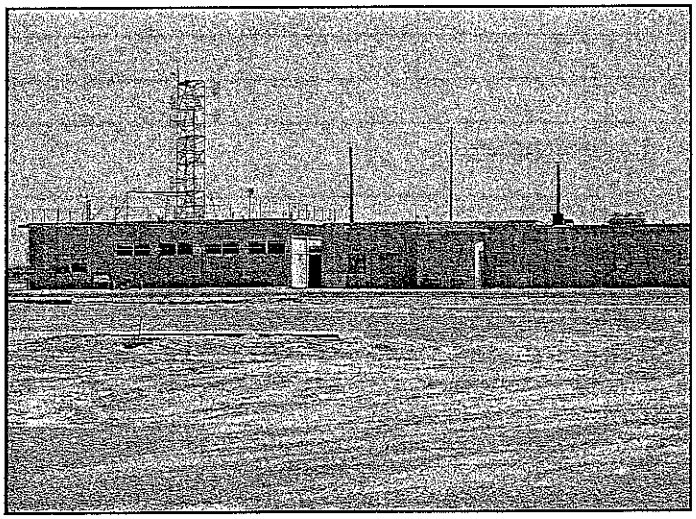
Comments: Few alterations since early improvements.

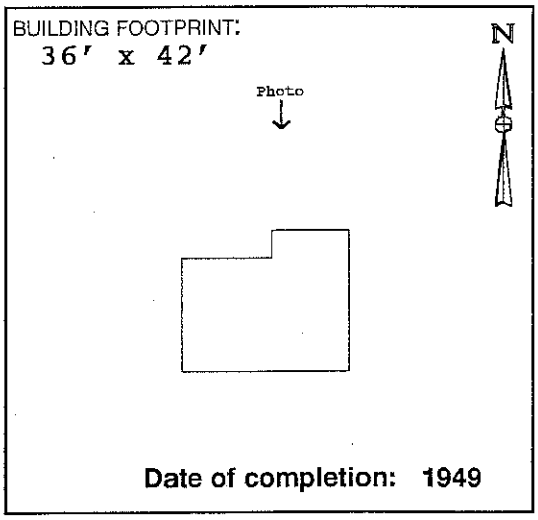
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Research recommended to determine historic use. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1103 is a one-story rectangular building with concrete masonry unit walls, and a flat roof. The original building was completed in 1949, according to "As-built" drawings located in CE File #1103-1. This original construction is centrally located, flanked to the east and west by subsequent additions. Real Property Accountable Record/1103 documents the addition of 2,930 square feet to the original building with the notation "Subsequent Improvements thru May 57." One or both additions to the original building may therefore be considered to be subsequent improvements, rather than additions that compromise historic integrity. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE: (Personal communication with Building 1103 personnel)

Current Function: (East end) Leased by WSMR to transmit mission timings.

Current Function: (West end) Unknown.

Original Function: Telemetering station for data collection of Range missions.

Interim Functions: Real Property Accountable Record/1103: "Communications CTR" (c1962); "Telecom Cen" (c1971); "Comm Fclty" (c1980); "Elec Rsch Rdr" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1103-2 (1967); CE File #1103-1 (1949).

Foundation: Concrete wall footing.

Exterior walls: Painted concrete masonry units (CMU).

Roof: Built-up roof on wood sheathing and 2 x 8 wood joists.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Although perhaps not meeting the "exceptional importance" stipulation imposed on buildings constructed within the last fifty years, Building 1103 may be eligbile for the National Register under Criterion A at a regional or national level in the year 1999. If further research determines that Building 1103 is not eligible as an individual property, consideration should be given to its eligibility as a contributing feature in a Cold War Multiple Property submission for its support of early Cold War-era test launches.

VII. ASSOCIATED BUILDINGS:

Building 1103 was associated during its historic period of significance with Building 1102, mobile data collection vans, and Building 300 at White Sands Missile Range.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1103 appears very different today from depictions on "As-built" drawings dated 1949. It is unclear whether additions to the east and west ends of the original building represent early improvements to the original building, or whether these additions represent later construction that has compromised the historic integrity of the original building. Information obtained from Real Property Record/1103 and field visits seems to indicate that the additions represent early improvements to the original building. If so, Building 1103 retains historic integrity. Further research is needed to verify the construction sequence, and to verify what early Cold War-era research activities were supported by Building 1103. Currently, Building 1103 is leased by the White Sands Missile Range. Aside from minor partitioning at the telemetering room, the original floor plan of the original building shows no alterations. Wood posts (6 x 6) that appear on original drawings to support the roof girders have been removed.

Suggested routine maintenance: Repair, or replace in kind, the exterior wood architectural features, including the soffit, fascia, wood doors, and louvers. Patch spalling concrete at foundation. Remove vegetation at roof.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Original telemetering room is now used as spare equipment storage.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Earlier location plans indicate three utility buildings situated in a row next to Building 1103 to the east. These buildings have been removed. Continues to be set in a somewhat isolated setting, in the vicinity of King-I.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Unable to access some rooms. Those rooms that were accessed, however, appear to have most of the original materials intact. A brick chimney and a metal stack have been removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original windows at north elevation have been covered up at the interior. The telemetering room has been partitioned (reversible).

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity

Comments: Building 1103 personnel are actively engaged in serving as a timing link for White Sands Missile Range tests.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

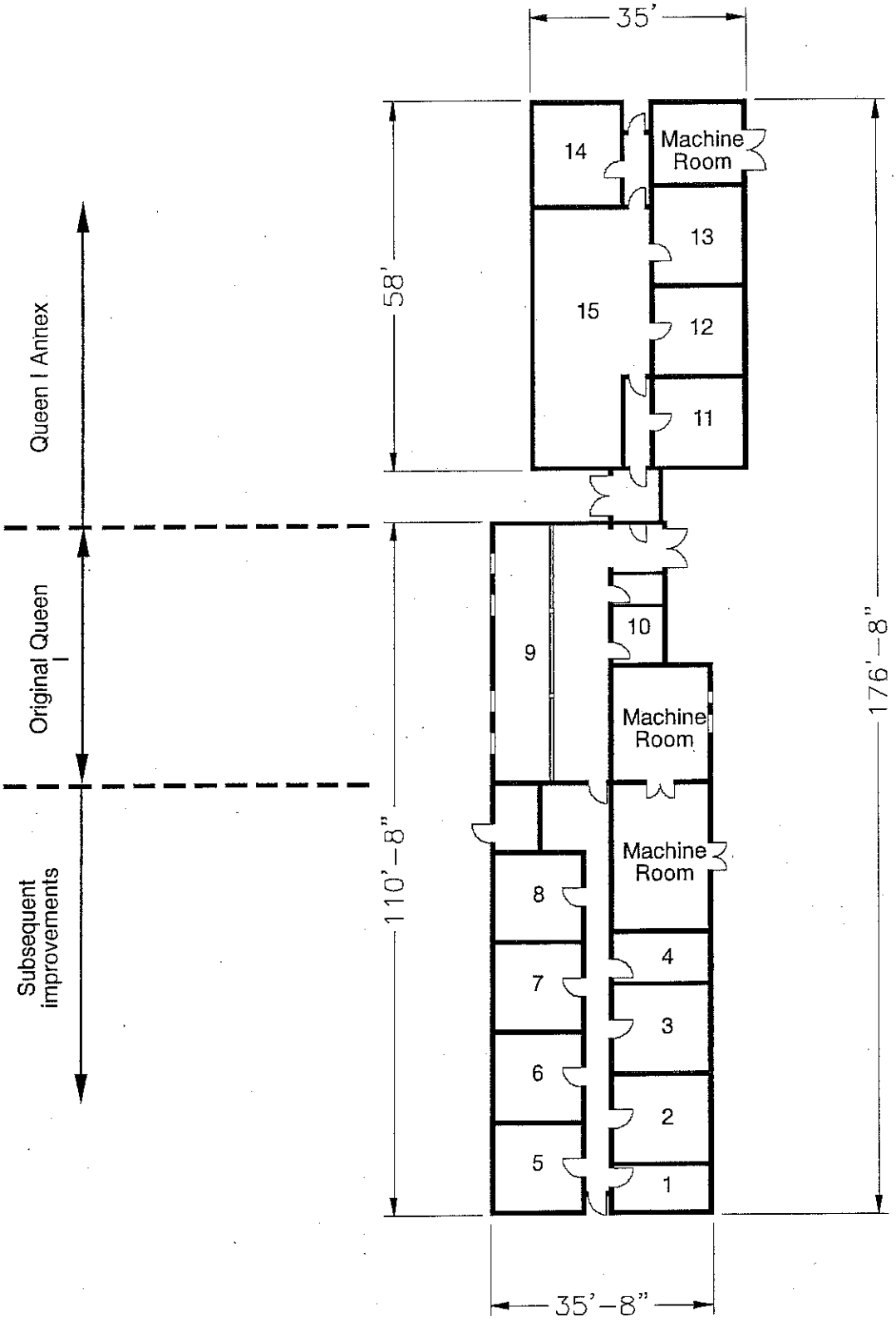
Comments: Building 1103 continues to provide support to the White Sands Missile Range.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #47**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: Dynalectron *Facilities Handbook*, c1964.

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1103** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1108

This building was constructed in 1958 and contains 2626 SF of floor space.
The building was originally built to serve as the telephone exchange. In 1980 it was retitled as a communications facility.
The building contains the following facilities:

- Toilet
- Lavatory
- Janitorial Sink

The drawings provided (Attachment 39-40) show a Utility Plot Plan, Septic Tank Details, Sewer Clean Out, Toilet Room Details and Plan Details.

Attachment 55e shows where the leach field was located for this building in 1984.

Site Specific Contingency Plan: See Attachment 1 and 2

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate into local area on ground

Tank location: North of facility

Fuel Flow - North

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST
MOGAS	250 gal each/ 2 /AST

REMOVED SEPTIC SYSTEMS

BUILDING 1119

This is an Army owned building that contains 2224 SF of floor space. Use and maintenance of the building was transferred to the Air Force in 2005. Prior to the Air Force taking possession the Army had delegated the building to the GSA for use as a vehicle maintenance shop. Once the Air Force took over, the building changed service to an electrical shop and storage facility.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
Diesel	250 gal ea/ 3 /AST
MOGAS	250 gal ea/ 2 /AST
Diesel	750 gal ea/ 3 /AST

Figure 9: Picture of Bldg 1119

REMOVED SEPTIC SYSTEMS

BUILDING 1150

This is also an Army owned building and therefore details are lacking from Holloman's records. The building has 2844 SF.
The original service is unknown, but since the Air Force started using the building it has been used as storage space.
It contains the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 9: Drawing of Bldg 1150

REMOVED SEPTIC SYSTEMS

BUILDING 1154

This is an Army owned building and there is no information in Holloman's files pertaining to this building.

Attachment 55c shows where the leach field was located for this building in 1984.

REMOVED SEPTIC SYSTEMS

BUILDING 1166

This building was constructed in 1960 and contains 4955 SF. The structure is a Test Track Shop/Storage Building known as the "Break Setter Building".
The facilities include:

- Toilets-2
- Urinal
- Lavatory
- Shower

Attachment 41 is a drawing showing the sewer layout and the septic tank details.

Attachment 55c shows where the leach field was located for this building in 1984.

Site Specific Contingency Action: See Attachment 3

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate in local area on ground; if full tank or drum spilled' the substance may reach open ditch.

Material Compatibility: No material incompatibilities

Chemical	Container Type
Oil/Water Separator Waste	500 gal/ 1 / UST

Figure 10: Picture of Bldg. 1166

REMOVED SEPTIC SYSTEMS

BUILDING 1175

Specifications and History: See "Cold War Survey"
Facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

In Attachments 42-44 a trench pit, the toilet room details, the trench junction to UPS, the sanitary sewer manhole and water and sewer piping can be found for Bldg 1175.

Attachment 55c shows where the leach field was located for this building in 1984.

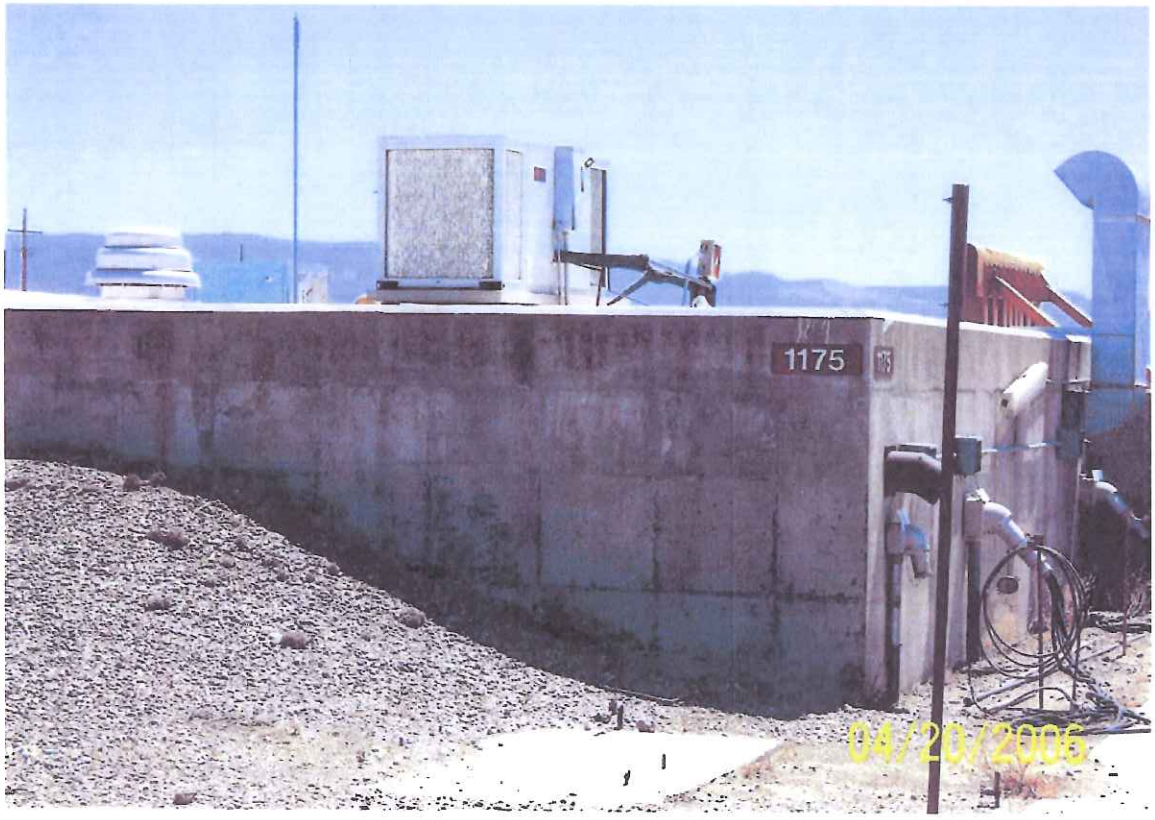


Figure 11: Picture of Bldg 1175

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Blockhouse--"Alpha".
Historic: Blockhouse--"Alpha".
Street Address: 1656 Test Track Rd., HAFB, 88330-7848.

Building Number: 1175

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1175 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

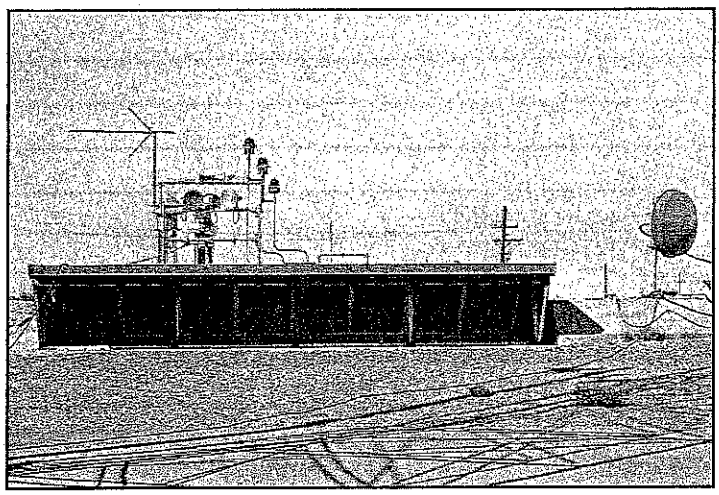
Comments: Modernization at interior to enable continued Test Track use.

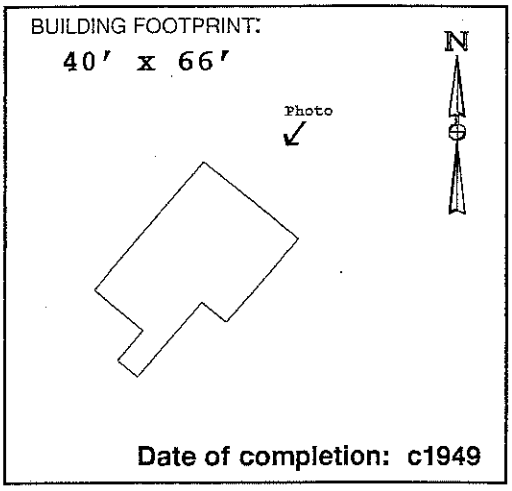
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible for the National Register under Criteria A and/or C.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1175 is an irregularly shaped, one-story concrete structure, built mostly below grade. The building is accessed by a ramp leading down to double doors at the southwest elevation. These doors access the original launch control room constructed in c1949. This entrance, three entrances off of the ramp, and windows facing the track (northeast) are the only visible openings. A 15′ x 32′-6″ addition was constructed at the northwest elevation in 1960 (CE File #1175-2). Another addition, adjacent to northwest side of ramp was completed in 1981 (CE File #1175-3). The ramp extension was also constructed at this time. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1175; CE File #1175-1 (c1949).

Current Function: Launch control facility, High Speed Test Track.

Original Function: Launch control facility, High Speed Test Track.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1175-1 (c1949); CE File #1175 (c1980).

Foundation: Concrete footings.

Exterior walls: Reinforced concrete.

Roof: 3-foot thick reinforced concrete.

Notable interior features, including machinery:
A long row of thick blast-proof windows faces the track to the northeast.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

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VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

"Alpha" Block house Building 1175 is one of the original High Speed Test Track support facilities, constructed c1949 to provide launch control. Recommend that Building 1175 be nominated under Criteria A and C as part of a basewide early Cold War Multiple Property listing.

VII. ASSOCIATED BUILDINGS:

Building 1175 operated, and continues to operate, in support of the high speed test track launching activities, along with Buildings 1162, 1163, 1161, 1645, and the Horizontal Test Stand facility (Buildings 1159 and 1160).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1175 retains historic integrity. Due to its national level of significance under Criteria A and C, recommend that Building 1175 be listed along with the other test track support buildings as part of a Multiple Property nomination to the National Register of Historic Places.

Subsequent improvements to the original Building 1175 augmented the original design and function as a launch control facility for important research conducted at the high speed test track. The interior was renovated in 1984 (CE File #1175-4). Although this renovation obscures original interior finishes, Building 1175 as a whole retains historic integrity of location, design, setting, workmanship, materials, feeling, and association. Of interest to future researchers may be the dramatic changes in computer technology which have occurred since the construction of Alpha Blockhouse: Computers which at that time required several rooms to house, now occupy considerably less space. Launch control operations continue at Alpha Blockhouse, although rooms designed to hold early equipment are virtually empty.

Suggested routine maintenance: Repair bond beam where steel is exposed. Remove vegetation at exterior embankments. Remove debris at front walkway.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Subsequent improvements to the original floor plan added to Building 1175's design and function as a launch control facility.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Except for the construction of smaller buildings in the vicinity, the original setting of Building 1175 near the test track launch pad has been retained.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: The raised wood floor in the console room has been removed. The original light fixtures have been removed. One wood and glass partition has been removed. Sheetrock® walls, carpeting, wainscot, and linoleum have been added to the control room.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original workmanship at the northeast elevation, and at the entrances at the ramp is still visible. Interior renovations hide the original architectural craftsmanship.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1175 continues to function as a launch control facility for the High Speed Test Track.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

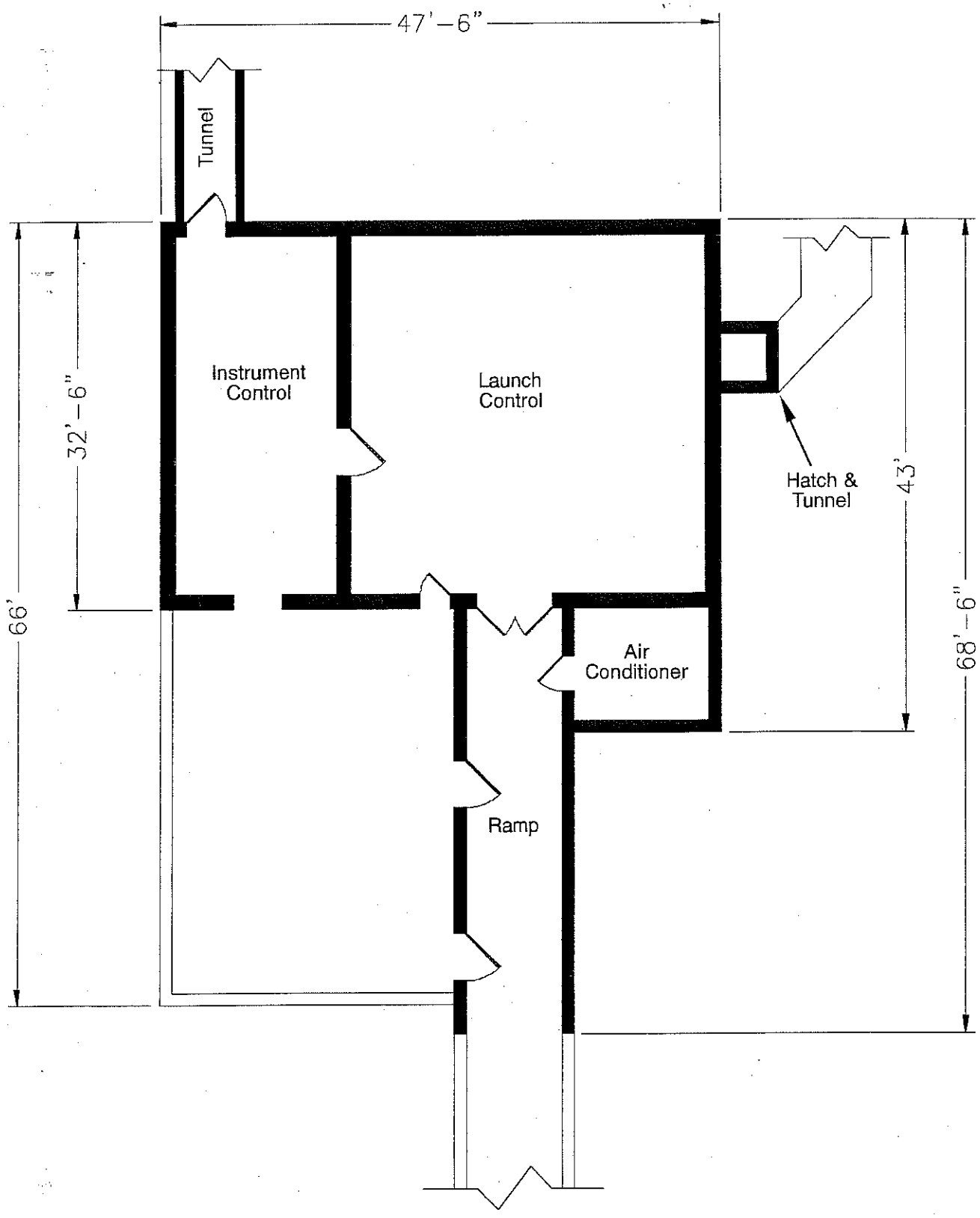
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #35**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1175 (c1980)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1175** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1176

This building was constructed in 1959 and contains 3850 SF.
The building is located at the Test Track and is known as the Sled Launch Shop.
Facilities include:

- Toilet
- Lavatory
- Shower

In Attachments 45-48 a plumbing plan, new drain pit, utility plan, sewer clean out, utilities contour plan and septic tank details can be found for Bldg 1176.

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 12: Picture of Bldg 1176

REMOVED SEPTIC SYSTEMS

BUILDING 1173

This building was constructed in 1957 and contains 17,428 SF.
The building is the main office building at the Test Track.
It contains the following facilities:

- Toilets-8
- Urinals-4
- Lavatories-9
- Janitorial Sinks-2

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 13: Picture of Bldg 1173

REMOVED SEPTIC SYSTEMS

BUILDING 1265

This building was constructed in 1957 and covers 43,388 SF.
This is the Inertial Guidance Facility, previously known as the Guided Weapons Lab.
The building contains the following facilities:

- Toilets-12
- Urinals-6
- Lavatories-12
- Janitorial Sinks-5

This building has been attached to the sewer system at Holloman AFB since before 1984.

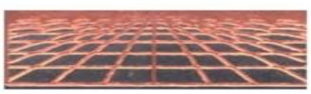
In Attachments 49-53 a Water Piping Diagram, Partial Plumbing Plan, Floor Plan, Building, Pavement and Utilities Layout, Sewer Clean Out, and Enlarged Plan can be found for Bldg 1265.

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-068

Appendix B
Geophysical Report

ULS SERVICES CORPORATION

GEOMARKOUT LOCATING Co a tradename



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5 July 2012

Christopher Long, P.G.
Scientist
Federal Services
Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, TX 77077

Subject: Field Documentation Report for Geophysical Services -
Location of Utilities and Underground Features Associated
With Former UST and Septic System Sites,
Holloman AFB, NEW MEXICO (SHAW PO 783916-000 OP)

Gentlemen:

This report documents the recent Geophysical Survey field work ULS Services Corp completed at the subject site On and between the dates of 11 June 2012 thru 23 June 2012.

SHAW / ULS SERVICES CORP
GEOPHYSCIAL SERVICES
FORMER UST AND SEPTIC SYSTEM SITES
5 JULY 2012

SCOPE OF WORK

Scope of this work is includes geophysical services at approximately 29 Former UST or Septic Systems sites located across Holloman AFB that have reportedly undergone past abandonment in place or excavation activities. Geophysical services are employed in an attempt to locate potential USTs, former UST excavation areas, abandoned septic tanks or excavations and associated leach field areas. Location of underground utilities near these observed features is included. Observations are marked out in field and electronically mapped with GPS data collection and GIS presentation. Survey of each site is approximately 25 by 25 to 100 by 100 feet in size.

METHODS

Methods utilized in performance of this work include: Visual Inspection, Analog Real - Time Electromagnetic Induction Conductivity Detection (EMICD), Magnetic Locating (MGL), Ground Penetrating Radar (GPR), and EM Pipe and Cable Location (EMPCL). A sub-meter WAAS GPS receiver with automatic real -time differential correction and ESRI Arcpad software is utilized to collect observation data. ESRI Arc View 10 GIS software is utilized for mapping presentation.

EMIMD ground induction methods are employed to detect both 1) broad metal mass anomalies (Rectangular Surface Projections) or conductive zones that may be indicative of potential USTs – Septic tanks, conductive metal debris, steel reinforced concrete, UST's, building hosts, piping, building demo materials, drums, sumps or other unknown burial materials; and 2) to detect relative lateral changes in conductive zones of soil or backfill materials relative to native soils. Former UST excavations and septic -leachate material may potentially have a higher conductive response or well drained leachate fill materials associated with septic systems may in some cases exhibit a relatively lower or quiet conductive response relative to surrounding higher conductive soil response. A two-way Cartesian grid pattern of five by five feet is walked within the search area (site). Observations are real time and marked on ground surface with paint and pin flagging. Observations are collected with a sub- meter GPS with automatic differential correction and plotted approximately onto web based imagery.

GPR is utilized to detect and potentially observe former UST excavation sidewalls as well as septic – leach field pit sidewall and fill areas. GPR is also utilized to compliment the EM Pipe and Cable utility survey work by potentially locating conductive as well as non-conductive utilities.

A EM Pipe and Cable Survey is conducted at each site by performing ambient passive live power and communication line sweeps, active ground induction sweeps, and active direct- connect or induction- clamp sweeps using existing conducts or pipes visibly nearby. Multiple active frequencies are utilized for best Detection. Utilities are identified where possible and marked unknown if not identified.

All observations are marked with hi-visibility orange-red marking paint. Some Ares are hi-lighted with black paint due to light soil conditions. GPR boundaries indicating potential septic tank and leach field areas are outlined with black paint. Pin flags are also utilized to mark these boundaries in soft soil and weed areas.

OBSERVATIONS

Site Description

The Project Site (Holloman AFB - Former UST and Septic Systems) is comprised of approximately 29 different environmental site locations (heir in referred to as Sites) . Each sites includes and varies in description from existing active building locations to in-active remote abandoned to former building areas where USTs or Septic systems were utilized in the past. Each Site is fairly flat with sandy to gravelly surface conditions. Some sites include native brush and weeds. Sites near active building areas include asphalt or concrete surfaces, sidewalks and planter areas. ULS field staff helped review historical documentation available of each site in the field. Where available, drawings and photographs were reviewed. When available, reported GPS coordinates from reports, of septic tank locations, were utilized by SHAW field staff to navigate to septic tank location to aid focus search area.

Generally there are no surface indications of USTS or Septic tanks, however some limited features exist at some sites and include potential vent riser pipes and asphalt patching, settling areas, and conidial – rectangular cracks in concrete. Surface indications of septic systems at some sites include potential inactive clean- outs pipes near building and nearby existing upgraded sewer man-hole systems that have been connected to the existing Base sewer collection system. Some septic system sites have open holes , surface erosion, and associated potential underground voids observed near the inactive cleanouts and suspected septic search area.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

General ambient or background EM conditions at this site are categorized as being high or noisy most likely resulting from caliche or saline soil conditions throughout the area. These conditions all result in a high ambient background EMICD response that are difficult to filter out, however, subtle to distinct lateral changes are observed potentially marking position of former UST excavations. Magnetic locator is not affected by saline conditions. GPR response in these conditions is poor to somewhat fair, however, subtle, trends in GPR observations exhibit dipping or high angle (from horizontal) refraction bands indicating potential soil side-wall trends allowing for location of approximate former excavations. The use of EMICD and GPR data in conjunction with historical information and physical observations are all utilized to mark the approximate location of potential former USTs in the field as shown on the GIS imagery maps.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

Similar response is observed near former septic systems. Most all septic tanks are reported to have been abandoned in place or partly crushed in place. Magnetic locator surveys revealed concentrated areas of metal response (metal anomalies) likely from metal plates and rebar in septic tanks in areas near former sewer clean-outs and next to reported septic tank locations where latitude and longitude data is available. EM Induction and GPR transects over these metal anomalies further corroborated these findings. EM Induction survey results near the effluent (down gradient) side of metal anomalies (potential septic tanks) resulted in observation of relatively moderately higher lateral response to zones of low to quiet lateral response zones near the septic tanks relative to the ambient response in surrounding area. GPR data across these zones exhibited very subtle side-wall trends that appear to corroborate with EMICD findings. The use of EMICD and GPR data in conjunction with historical information and physical observations of cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs in the field and as shown on the GIS imagery maps.

CONCLUSIONS and LIMITATIONS

The use of EMICD and GPR data in conjunction with historical information and physical observations of reported building location, vent riser location, boiler room location, existing and abandoned sewer cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs , Septic tanks and leach fields. Ambient soil conductivity at this site is very high and EM and GPR data observed is very subtle. Field trends are used to mark the approximate location of potential targets.

As in any type of survey or investigation to determine characteristics below grade, careful exploratory excavation or drilling may be needed to further help determine a more accurate determination of the subsurface. Use of hand tools and air knifing is also useful to help as a safety measure. Base one- call utilities, as well as, private 811 one –call should be consulted and recalled as necessary.

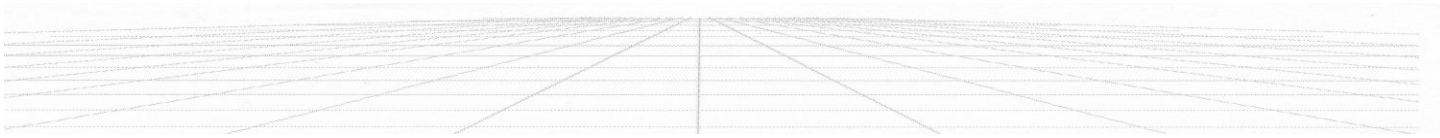
If you have any questions regarding this report please contact me at (206) 384- 2857.

Sincerely,

ULS SERVICES CORPORATION
Geomarkout tradename

Michael W. Benedict
Site Representative

Admin Office/Billing: PO Box 724 Pocatello, Idaho 83204
(208) 234-1441 Fax (208) 234-1507 1 800 301-4420
Seattle / Portland / SAC / Alaska / HWI – AS - GUAM Operations
1 - (866) 804- 5734 / San Diego – LA / Operations 1 - (800) 528-8206



BLDG 1166 POTENTIAL SEPTIC SYSTEM
HOLLOMAN AFB

WGS_1984_UTM_Zone_13N
ULS SERVICES CORP
mwb 20 June 2012

0 15 30 60 90 120
Feet

Appendix C
Sample Collection Logs

Sample Collection Log

STATION 1

Shaw Solutions

- Holloman AFB

Manager Christopher Long

Location Code OTC542

RFA / COC Number 144106 - H009

Sample Number OTC542-IS-0001-~~MMDDYY~~ 070212

Task

Sample Name OTC542-z-OTC542-IS-0001-MMDDYY-z

Collection Date 070212

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1250

Sample Purpose ~~Unknown~~ Invest.

Start Depth 3'

End Depth 5'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) (EB) (FB)

SampleTeam CH

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Persevative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Logged By / Dat Chas Bird 7/2/12 Reviewed By / Dat

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager Christopher Long

Location Code FIELDQC

RFA / COC Number 144106 - H009

Sample Number OTC542-IS-0002-~~MMDDYY~~ 070212 -FD

Task

Sample Name FIELDQC-z-OTC542-IS-0002-MMDDYY-FD-z

Collection Date 070212

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1250

Sample Purpose ~~Unknown~~ Invest.

Start Depth 3'

End Depth 5'

QC Code FIELD DUPLICATE

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* [signature] 07/07/12 *Reviewed By / Dat* _____

STATION 1

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code OTC542

RFA / COC Number 144106 - H009

Sample Number OTC542-IS-0003-~~MMDDYY~~ 070212

Task

Sample Name OTC542-z-OTC542-IS-0003-MMDDYY-z

Collection Date 070212

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1255

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 12'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Wm 7/2/12 *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw a world of Solutions

Manager Christopher Long

Location Code OTC542 *RFA / COC Number* 144106 - 1009

Sample Number OTC542-IS-0004-~~MMDDYY~~ 070212 *Task*

Sample Name OTC542-z-OTC542-IS-0004-MMDDYY-z *Collection Date* 070212

Sampling Method ~~Unknown~~ DPT *Sample Type* ~~Unknown~~ Grab *Collection Time* 1300

Sample Purpose ~~Unknown~~ Invest. *Start Depth* 7'

QC Code NORMAL ENVIRONMENTAL SAMPL *End Depth* 9'

Sampling Equip Geoprobe *Sample Matrix* SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Hill 7/2/12 *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw A CB&I Company Solutions

Manager Christopher Long

Location Code OTC542 *RFA / COC Number* 144106 - H009

Sample Number OTC542-IS-0005-~~MMDDYY~~ 070212 *Task*

Sample Name OTC542-z-OTC542-IS-0005-MMDDYY-z *Collection Date* 070212

Sampling Method ~~Unknown~~ DPT *Sample Type* ~~Unknown~~ Grab *Collection Time* 1305

Sample Purpose ~~Unknown~~ Invest. *Start Depth* 14'

QC Code NORMAL ENVIRONMENTAL SAMPL *End Depth* 16'

Sampling Equip Geoprobe *Sample Matrix* SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* [signature] 7/2/12 *Reviewed By / Dat* _____

STATION 3

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code OTC542

RFA / COC Number 144106 - H009

Sample Number OTC542-IS-0006-~~MMDDYY~~ 070212

Task

Sample Name OTC542-z-OTC542-IS-0006-MMDDYY-z

Collection Date 070212

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1310

Sample Purpose ~~Unknown~~ invest.

Start Depth 3'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 5'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) *(EB)* *(FB)* *SampleTeam*

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* 7/2/12 *Reviewed By / Dat*

Sample Collection Log

STATION 3

Shaw A CB&I Solutions

- Holloman AFB

Manager Christopher Long

Location Code OTC542

RFA / COC Number 144106 - H009

Sample Number OTC542-IS-0007-~~MMDDYY~~ 070212

Task

Sample Name OTC542-z-OTC542-IS-0007-MMDDYY-z

Collection Date 070212

Sampling Method ~~Unknown~~ PPT

Sample Type ~~Unknown~~ Grab

Collection Time 1315

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 12'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: _____

Sketch Location:

Shaw *Logged By / Dat* [signature] 7/2/12 *Reviewed By / Dat* _____

STATION 4 / MW01

Sample Collection Log

- Holloman AFB

Shaw Environmental Solutions

Manager **Christopher Long**

Location Code OTC542 *RFA / COC Number* 144106 - H009

Sample Number OTC542-IS-0008-~~MMDDYY~~ 070212 *Task*

Sample Name OTC542-z-OTC542-IS-0008-MMDDYY-z *Collection Date* 070212

Sampling Method ~~Unknown~~ DPT *Sample Type* ~~Unknown~~ Grab *Collection Time* 1320

Sample Purpose ~~Unknown~~ Invest. *Start Depth* 3'

QC Code NORMAL ENVIRONMENTAL SAMPL *End Depth* 5'

Sampling Equip Geoprobe *Sample Matrix* SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Hill 7/2/12 *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw a CB&I company Solutions

Manager Christopher Long

Location Code OTC542 *RFA / COC Number* 144106 - H009

Sample Number OTC542-IS-0009-~~MMDDYY~~ 070212 *Task*

Sample Name OTC542-z-OTC542-IS-0009-MMDDYY-z *Collection Date* 070212

Sampling Method ~~Unknown~~ DPT *Sample Type* ~~Unknown~~ Grab *Collection Time* 1325

Sample Purpose ~~Unknown~~ Invest. *Start Depth* 10'

QC Code NORMAL ENVIRONMENTAL SAMPL *End Depth* 12'

Sampling Equip Geoprobe *Sample Matrix* SOIL

QC Partners:
(TB) *(EB)* *(FB)* *SampleTeam*

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Hill 7/2/12 *Reviewed By / Dat*

Sample Collection Log

- Holloman AFB

Shaw Solutions

Manager Christopher Long

Location Code OTC542 *RFA / COC Number* 144106 - H009

Sample Number OTC542-IS-0010-~~MMDDYY~~ 070212 *Task*

Sample Name OTC542-z-OTC542-IS-0010-MMDDYY-z *Collection Date* 070212

Sampling Method ~~Unknown~~ DPT *Sample Type* ~~Unknown~~ Grab *Collection Time* 1415

Sample Purpose ~~Unknown~~ Invest. *Start Depth* 0'

QC Code NORMAL ENVIRONMENTAL SAMPL *End Depth* 2'

Sampling Equip Geoprobe *Sample Matrix* SOIL

QC Partners:
(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Tolin 7/2/12 *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Shaw A world of Solutions

Manager Christopher Long

Location Code OTC542 *RFA / COC Number* 144106-H009

Sample Number OTC542-IS-0011-~~MMDDYY~~ 070212 *Task*

Sample Name OTC542-z-OTC542-IS-0011-MMDDYY-z *Collection Date* 070212

Sampling Method ~~Unknown~~ DPT *Sample Type* ~~Unknown~~ Grab *Collection Time* 1420

Sample Purpose ~~Unknown~~ Invest. *Start Depth* 23'

QC Code NORMAL ENVIRONMENTAL SAMPL *End Depth* 25'

Sampling Equip Geoprobe *Sample Matrix* SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Hun 7/2/12 *Reviewed By / Dat* _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code ~~OTC531A (Bldg 920)~~ OTC542 Bldg 1166 RFA / COC Number 144106-~~H017~~ H033 cu

Sample Number ~~OTC531-GW-5311-MMDDYY~~ OTC542-GW-~~5421~~ cu 0001 -082412 Task

Sample Name ~~OTC531-z-OTC531-GW-5311-MMDDYY-z~~ ~~OTC531A 5311A1 071712~~ OTC542-z-OTC542-GW-5421-082412 microprge Grab

Collection Date ~~071712~~ cu 8/24/12

Collection Time cu ~~1425~~ 0915

Sampling Method **Unknown** invest.

Sample Type **Unknown**

Sample Purpose **Unknown**

Start Depth

End Depth

QC Code **NORMAL ENVIRONMENTAL SAMPLE**

Sampling Equip QED Bladder Pump

Sample Matrix **GROUND WATER**

QC Partners:

(TB) (EB) (FB)

SampleTeam ~~CH/CL~~ CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SW8015B : GRO	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	C	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
SW8015B : ORO	D	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015B : DRO	D	Unknown	2	1	L	1 Liter Amber Glass	H2SO4
PCBs by SW8082A	E	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Explosives by SW8330A	F	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Tritium by 906.0 Mod	G	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Mercury by SW7470A	H	Unknown	0	500	ML	500 ml Poly Container	HNO3
Metals by SW6020A	H	Unknown	0	500	ML	500 ml Poly Container	HNO3
Metals by SW6010C	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
Total CN water by 335.4	I	Unknown	1	500	ML	500 ml Poly Container	NaOH
TDS by 160.1	J	Unknown	1	500	ML	500 ml Poly Container	Cool to 4°

Comments: pumping at 100mL per minute.

Sketch Location:

Logged By / Dat ~~Chase Hall 8/24/12~~ Reviewed By / Dat

CHall 8/24/12

Sample Collection Log

Page: ~~19 of 49~~ 1/1

Shaw Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code ~~FIELDQC~~ IDW

RFA / COC Number HO 38

Sample Number ~~OTC644-GW-0441-MMDDYY-FD~~ LDY-IDWD1-090412

Sample Name ~~FIELDQC-2-OTC644-GW-0441-MMDDYY-FD-z~~

Task

Collection Date 09/04/2012

Sampling Method ~~Unknown~~ Composite

Sample Type ~~Unknown~~ Soil

Collection Time 1330

Sample Purpose ~~Unknown~~ IDW characterization

Start Depth NA

QC Code ~~FIELD DUPLICATE~~ NA

End Depth NA

Sampling Equip Stainless steel Trowel/Bowl/Aluminum

Sample Matrix ~~GROUND WATER~~ IDW Soil

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam LaThom, Hodu

Containers:

	Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
1)	VOCs by SW8260C TCLP VOCs	A	Unknown	~~3~~ 1	~~40~~ 8oz	~~ML~~	~~40 ml VOA Vials~~ Glass	~~HCL~~ Cool to 4°C
	~~SW8015B : GRO~~	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
2)	SVOCs by SW8270D TCLP SVOCs / other organics	EB	Unknown	~~2~~ 1	8	x oz	~~1 Liter Amber Glass~~ Glass	Cool to 4°
	~~SW8015B : GRO~~	B	Unknown	0	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~SW8015B : DRO~~	B	Unknown	2	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~PCBs by SW8082A~~ ~~TCLP~~	E	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
	~~Explosives by SW8330A~~	F	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
3)	~~Tritium by 906.0 Mod~~ RCI	C	Unknown	~~2~~ 1	~~1~~ 8oz		~~1 Liter Amber Glass~~ Glass	~~Cool to 4°C~~ Cool to 4°C
4)	Mercury by SW7470A TCLP Mercury	~~F~~ D	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~ oz	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
5)	Metals by SW6020A TCLP Metals	~~H~~ E	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
	~~Metals by SW6010C~~	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
	~~Total CN water by 335.4~~	I	Unknown	1	500	ML	~~500 ml Poly Container~~	NaOH
	~~TDS by 160.1~~	J	Unknown	1	500	ML	500 ml Poly Container	~~Cool to 4°~~

Comments: Composite Soil sample for TCLP analyses of IDW cuttings rolloff at Lay down Yard, 09/04/12

Sketch Location: Rolloff box Composite Sample @ Lay down Yard.

Analyses: TCLP VOCs, TCLP SVOCs, TCLP metals, TCLP Mercury, RCI

LDY = Lay down Yard

~~Shaw~~ *Logged By / Dat* Mel Hall *Reviewed By / Dat* _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code BULK WATER TANK

RFA / COC Number 144106 H070

Sample Number HAFB-IDW-BULK WATER-0001-111612

Task 144106.JM20000

Sample Name HAFB-IDW-BULK WATER-0001-111612

Collection Date 11/16/12

Sampling Method BAILER

Sample Type GRAB

Collection Time 13:00

Sample Purpose CONFIRM IDW

Start Depth N/A

QC Code

End Depth N/A

Sampling Equip DISPOSABLE BAILER

Sample Matrix **WATER**

QC Partners:

(TB) (EB) (FB)

SampleTeam JH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	B	Unknown	4	8	8OZ	Amber Glass	Cool to 4°
SW8015 : ORO	C	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015 : DRO	C	Unknown	1	1	L	1 Liter Amber Glass	H2SO4
Metals by SW6020A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
METALS by SW6020A	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Mercury by SW7470A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Metals by SW6010C	D	Unknown	1	500	ML	500 ml Poly Container	HNO3
	E		1	500	ML	500 ml Poly Cont	Cool to 4°
SW8015 : GRO	F	Unknown	3	40	ML	40 ml VOA Vials	HCL

Comments: SAMPLE COLLECTED FROM BULK WATER STORAGE TANK AFTER ALL WATER DRUMS WERE CONSOLIDATED. SENT BOTH A PRESERVED AND UNPRESERVED 500ML POLY FOR METALS. SPOKE WITH LAB AND THEY SAID TO SEND UNPRESERVED, BUT I THINK MAYBE THEY MADE A MISTAKE.

Sketch Location:

Shaw Logged By / Dat

Reviewed By / Dat

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code BULK WATER TANK

RFA / COC Number 144106 H070

Sample Number HAFB-IDW-BULK WATER-0001-111612

Task 144106.JM20000

Sample Name HAFB-IDW-BULK WATER-0001-111612

Collection Date 11/16/12

Sampling Method BAILER

Sample Type GRAB

Collection Time 13:00

Sample Purpose CONFIRM IDW

Start Depth N/A

QC Code

End Depth N/A

Sampling Equip DISPOSABLE BAILER

Sample Matrix **WATER**

QC Partners:

(TB) (EB) (FB)

SampleTeam JH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	B	Unknown	4	8	8OZ	Amber Glass	Cool to 4°
SW8015 : ORO	C	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015 : DRO	C	Unknown	1	1	L	1 Liter Amber Glass	H2SO4
Metals by SW6020A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
METALS by SW6020A	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Mercury by SW7470A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Metals by SW6010C	D	Unknown	1	500	ML	500 ml Poly Container	HNO3
	E		1	500	ML	500 ml Poly Cont	Cool to 4°
SW8015 : GRO	F	Unknown	3	40	ML	40 ml VOA Vials	HCL

Comments: SAMPLE COLLECTED FROM BULK WATER STORAGE TANK AFTER ALL WATER DRUMS WERE CONSOLIDATED. SENT BOTH A PRESERVED AND UNPRESERVED 500ML POLY FOR METALS. SPOKE WITH LAB AND THEY SAID TO SEND UNPRESERVED, BUT I THINK MAYBE THEY MADE A MISTAKE.

Sketch Location:

Shaw Logged By / Dat

Reviewed By / Dat

Appendix D
Boring Logs

Boring ID: OT-C542-Station 1

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JM20000
Project Site: Building 1166

Date Completed: 7/2/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4060.65
Y Coordinate: 686092.9841
X Coordinate: 1672400.3126

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); brown; dry; soft.	ML	Hand auger from 0 - 5 ft. Began drilling on 7/2/12.
5		OTC542-IS-0001-070212 OTC542-IS-0002-070212	NR		Same as above (0 ft); trace very fine sand. Lean CLAY (CL); mottled reddish brown and white; few grading to some gypsum; significant silt content.	CL	
10		OTC542-IS-0003-070212	NR		Poorly graded SAND with Silt (SP-SM); red; dry; loose; very fine sand; trace fine gypsum. Lean CLAY (CL); mottled red and white; dry; medium stiff. Note: trace gypsum. Poorly graded SAND (SP); light brown to white; dry; loose; very fine sand; trace silt.	SP-SM_ CL_ SP	
15			NR				Total depth = 15 ft. Reached total depth on 7/2/12. **Water table not encountered in this boring.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:55 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN.GPJ

Boring ID: OT-C542-Station 2

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JM20000
Project Site: Building 1166

Date Completed: 7/2/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4060.63
Y Coordinate: 686076.3760
X Coordinate: 1672406.6948

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); brown; dry; soft.	ML	Hand auger from 0 - 5 ft. Began drilling on 7/2/12.
5			NR		Same as above (0 ft); trace very fine sand.		
					Lean CLAY (CL); mottled reddish brown and white; dry; soft; trace very fine sand.	CL	
		OTC542-IS-0004-070212			Poorly graded SAND with Silt (SP-SM); red; dry; loose to medium dense; very fine sand. Note: gypsum present.	SP-SM	
10			NR				
					Lean CLAY (CL); mottled red and white; dry to damp; medium stiff to stiff. Note: gypsum present.	CL	
					Silty SAND (SM); light brown to white; dry; loose.	SM	
15		OTC542-IS-0005-070212	NR				
					Silty Sand (SM); mottled red and white; dry; medium dense. Note: trace gypsum present.		Total depth = 18 ft. Reached total depth on 7/2/12.
20							**Water table not encountered in this boring.
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:56 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN.GPJ

Boring ID: OT-C542-Station 3

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JM20000
Project Site: Building 1166

Date Completed: 7/2/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Ground Elevation AMSL (ft):4060.73
Y Coordinate: 686082.6401
X Coordinate: 1672419.7910

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); brown; dry; soft; trace coarse gravel.	ML	Hand auger from 0 - 5 ft. Began drilling on 7/2/12.
5		OTC542-IS-0006-070212	NR		Poorly graded SAND with Silt (SP-SM); red; dry; loose; very fine sand; trace silt. Note: trace gypsum.	SP-SM	
10		OTC542-IS-0007-070212	NR		Lean CLAY (CL); mottled red and white; dry to damp; medium stiff to stiff. Note: gypsum present.	CL	
15			NR		Clayey SAND (SC); light brown to white; dry; loose; trace silt.	SC	Total depth = 15 ft. Reached total depth on 7/2/12. **Water table not encountered in this boring.
20							
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:56 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN.GPJ

Boring ID: OT-C542-Station 4 (OTC542-MW01)

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JM20000
Project Site: Building 1166

Date Completed: 7/2/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Top of PVC Riser Pipe AMSL (ft): 4060.98
Y Coordinate: 686101.3307
X Coordinate: 1672448.2037

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0		OTC542-IS-0010-070212	NR		SILT (ML); brown; dry; soft; trace coarse gravel.	ML	Hand auger from 0 - 5 ft. Began drilling on 7/2/12.
5		OTC542-IS-0008-070212	NR		Poorly graded SAND with Silt (SP-SM); red; dry; loose; very fine sand. Note: trace gypsum.	SP-SM	
10		OTC542-IS-0009-070212	NR		Poorly graded SAND (SP); light brown to white; dry; loose; very fine sand; trace silt. Same as above (7 ft). Same as above (7 ft); trace gravel.	SP	
15			NR		SILT with Sand (ML); brown; dry; soft.	ML	
20			NR		Poorly graded SAND (SP); light brown to white; dry; loose; trace gravel.	SP	
					Lean CLAY (CL); mottled red and white; dry; medium firm to firm. Note: gypsum present.	CL	
					Poorly graded SAND (SP); light brown to white; dry; loose; trace gravel.	SP	
					Poorly graded SAND with Silt (SP-SM); reddish brown; damp; medium dense.	SP-SM	
25		OTC542-IS-0011-070212	NR		Same as above (18 ft).	CL	
					Same as above (21.5 ft); red; moist; loose to medium dense. Same as above (24 ft); saturated; medium gravel.	SP-SM	
					SILT with Sand (ML); reddish brown; wet to saturated; soft to medium firm.	ML	
					Poorly graded SAND (SP); light brown; saturated; medium dense; trace silt.	SP	
30					Same as above (21 ft); light brown; moist;	SP-	

Boring ID: OT-C542-Station 4 (OTC542-MW01)

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JM20000
Project Site: Building 1166

Date Completed: 7/2/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: B.Squire

Top of PVC Riser Pipe AMSL (ft): 4060.98
Y Coordinate: 686101.3307
X Coordinate: 1672448.2037

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
30			NR		dense.	SM	Total depth = 30 ft. Reached total depth on 7/2/12.
35							
40							
45							
50							
55							
60							

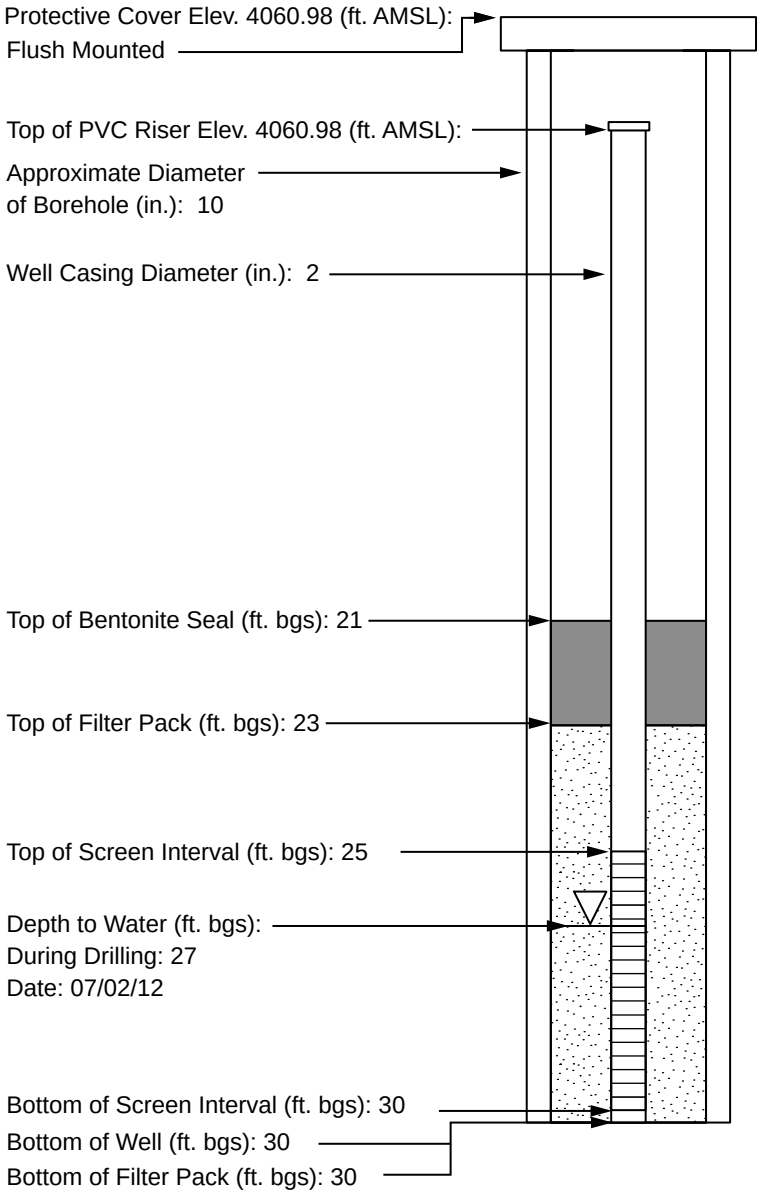
Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-068

Appendix E
Well Construction Diagrams

Well Construction Diagram

Project: Holloman AFB
Location: OT-C542
Client: USAF
Subcontractor: Major Drilling
Driller: K. Burkhead
Drilling Method/Rig Type: DPT/Auger
Shaw Field Representative: B. Squire

Well Number: OTC542-MW01
Site Location: Building 1166
Installation Date: 07/02/2012
Completion Date: 07/02/2012
Grid Northing: 686101.3307
Grid Easting: 1672448.2037
NAD 83 SPCS NM Central
NAVD 88



Not To Scale

Protective Casing: Circular
- Type: Flush Mount
- Dimensions (in.): 8
- Length (in.): 10
- Guard Post: NA

Ground Seal (Surface pad):
- Dimensions (ft.): 2 x 2
- Type: Concrete

Annular Space Seal:
- Type: QuickCrete & QuickGel Bentonite
- Installation: Gravity

Bentonite Seal:
- Manufacturer: Enviro Plug
- # of Bags: 2 (50 lbs each)
- Type: 3/8" Pellets
- Installation: Gravity
- Hydration time (hrs): 1

Filter Pack Material:
- Manufacturer: DSI
- Product Name: Well Gravel Pack
- Size: GP #3
- # of bags: 3 (50 lbs each)
- Installation: Gravity

Well Casing Used (ft.):
- Manufacturer: Silverline
- Type: PVC Schedule 40
- Diameter (in.): 2

Well Screen Casing:
- Manufacturer: DSI
- Type: 2" Pre-pack w/ vf SS Mesh w/ 1A Sand
- Slot Size (in.): 0.010
- Slot Type: Factory

Sump/End Cap (in.): 4 (PVC)
Backfill Material: NA

Appendix F
Well Purge Records

Shaw E & I

EXAMPLE
WELL PURGE RECORD

Project Name: Midwest / Holloman AFB

Location: Bldg 11606 (OTC5A2)
Personnel: C. Lalhance
Date (Start/End): 8/24/12
Method of Development: N/A

Well/Piez. No.: OTC5A2-1
Date Installed: 7/8/12
Csg. Diameter (I.D.): 2"
Total Depth (ft. TOC): 28.98

☐ Surging ☐ Bailing ☐ Pumping ☒ Other (State Method) Sampling
☐ Original Development ☐ Redevelopment ~~Development~~ Sample Date: 8/24/12

Depth to water before developing well: 24.40 ft btoc ; 24.20 post tubing

			Volume (V)		Purge Factor		Volume To Purge
Height of Water Column:	_____	feet	_____	=	_____ gal.*	_____	= _____

$V = (B * r_c^2 * L_c * 7.48) \div (B*(r_w-r_c)^2*L_s*\varnothing_s*7.48) =$ _____ gallons (See Notes below)

Depth purging from: 28 feet
Time purging begins: 8/24/12
Weather: Sunny, 70's, Calm
Screened Interval (ft. BGL): _____
Equipment Nos.: pH Meter YSI 6820 ~~EC Meter~~ #316920 Turbidity Meter N/A
Equipment decontaminated prior to development Y X N _____
Describe pump cleaned w/ alconox and DI H2O

pump @ 100 mL/min

Date	Time	Water Level (ft. below TOC)	Volume Removed (gal.)	Temp (C or F)	pH	~~EC~~ Cond MS/cm	Turbidity	D.O.	~~Comments~~ ORP	TDS (g/L)
8/24	0817	26.30	0	21.52	7.43	14.82	57.4	1.98	112.1	9.610
"	0822	27.40	.5	21.40	7.43	14.73	47.8	1.60	125.9	9.606
"	0831	27.40	1	22.23	7.47	14.77	30.7	2.65	128.2	9.599
"	0836	27.40	1.5	22.59	7.49	14.71	21.8	3.31	127.1	9.602
"	0841	27.39	2	22.98	7.49	14.73	18.7	3.67	124.7	9.589
"	0846	27.45	2.5	23.42	7.50	14.72	17.7	3.92	123.6	9.590
"	0851	27.50	3	23.63	7.50	14.72	13.5	4.12	121.8	9.535
"	0856	27.50	3.5	23.80	7.50	14.73	10.3	4.50	120.2	9.527
"	0859	27.50	3.75	23.85	7.50	14.73	7.0	4.55	120.5	9.530

Notes:
- Water levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to 0.1 pH units
- Electrical conductivity (EC) – Reported to the nearest 10% mhos/cm or µmho/cm @25 C or in mS/cm of instrument set range
- Water temperature – Reported to the nearest 0.1 C or F
- Dissolved oxygen (D.O.) report in 0.1 mg/L
- Turbidity report in NTV nearest whole #

Where:
B=3.14
$\varnothing_s$=porosity of the sand pack
r_c=radius of the well casing and screen in feet
L_c=length of water column inside the casing and screen in feet
r_w=radius of the well bore in feet
L_s=length of saturated portion of the sand pack in feet
7.48 gallons/cubic foot=conversion from cubic feet to gallons

* 0915 sample time *

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-068

Appendix G
Site Survey Data

Revised Rpt
09/11/2013
(re: TU/US-C513)
p. 7 of 10

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	682987.8550	1687022.9920	4098.16	BASE	682789.9107	1686534.0572
2	678390.1010	1678735.5020	4064.77	CP-52-P-19	678193.4892	1678248.9690
3	683252.1480	1680789.5360	4078.80	CP-55-JACK	683054.1271	1680302.4077
4	681667.1260	1694574.3780	4140.57	CP-56-AIR	681469.5645	1694083.2546
5	669733.4460	1682234.2110	4048.59	HAFB-07-07	669539.3431	1681746.6640
6	669695.2030	1718768.4150	4157.95	ALAMOAIR	669501.1112	1718270.2797
7	674362.7100	1713591.4300	4160.17	F248	674167.2655	1713094.7951
8	676850.6600	1718114.2590	4193.99	E-248	676654.4944	1717616.3133
50	691964.7620	1687201.2770	4140.90	MALONE	691764.2160	1686712.2905
51	662077.1700	1670356.4250	4077.10	BATE	661885.2861	1669872.3205
52	678390.1080	1678735.5040	4066.10	P 19	678193.4962	1678248.9710
53	644127.0780	1700529.8000	4039.00	MONT	643940.3964	1700036.9506
54	676850.6920	1718114.2670	4193.99	E 248	676654.5264	1717616.3213
55	683252.1970	1680789.5390	4080.20	JACK	683054.1761	1680302.4107
56	681667.0380	1694574.3640	4141.20	AIR	681469.4765	1694083.2406
82	678193.4999	1678248.9801	4064.92	P	677996.9451	1677762.5882
84	676654.5300	1717616.3305	4192.77	E	676458.4212	1717118.5291
85	683054.1798	1680302.4198	4079.02	JACK	682856.2163	1679815.4327
86	681469.4802	1694083.2497	4140.00	AIR	681271.9760	1693592.2686
100	685975.0760	1686614.9100	4101.87	OT-C534-PVC	685776.2660	1686126.0934
101	685975.4260	1686614.8310	4102.28	OT-C534-CASING	685776.6159	1686126.0145
102	685952.4860	1686626.9650	4101.89	OT-C534-W2-PVC	685753.6825	1686138.1449
103	685952.6870	1686626.9300	4102.33	OT-C534-W2-CASING	685753.8834	1686138.1099
104	685939.9110	1686581.7340	4101.89	OT-C534-W1-CASING	685741.1111	1686092.9270
105	685939.6450	1686581.7790	4101.57	OT-C534-W1-PVC	685740.8452	1686092.9720
106	685924.3640	1686619.9800	4101.81	OT-C534-W4-PVC	685725.5687	1686131.1620
107	685924.6590	1686619.8790	4102.23	OT-C534-W4-CASING	685725.8636	1686131.0610
108	685934.1180	1686578.3320	4101.72	OT-C534-LEACH-NG	685735.3198	1686089.5260
109	685935.7830	1686600.7340	4101.88	OT-C534-LEACH-NG	685736.9843	1686111.9215
110	685938.2680	1686607.0980	4101.88	OT-C534-LEACH-NG	685739.4686	1686118.2837
111	685951.4240	1686604.4600	4101.90	OT-C534-LEACH-NG	685752.6208	1686115.6465
112	685953.8200	1686601.1380	4101.88	OT-C534-LEACH-NG	685755.0161	1686112.3254
113	685953.2500	1686596.8650	4101.88	OT-C534-LEACH-NG	685754.4463	1686108.0537
114	685946.2830	1686578.3790	4101.81	OT-C534-LEACH-NG	685747.4813	1686089.5730
115	685945.3070	1686576.3400	4101.88	OT-C534-LEACH-NG	685746.5056	1686087.5346
116	685940.6850	1686575.6580	4101.79	OT-C534-LEACH-NG	685741.8849	1686086.8528
117	685952.3510	1686614.8200	4102.03	OT-C534-LEACH-NG	685753.5475	1686126.0035
118	685953.0040	1686623.0300	4102.13	OT-C534-LEACH-NG	685754.2004	1686134.2111
119	685945.6920	1686623.1960	4102.03	OT-C534-LEACH-NG	685746.8905	1686134.3770
120	685944.8810	1686615.5440	4101.97	OT-C534-LEACH-NG	685746.0797	1686126.7272
121	685948.0570	1686615.1700	4101.97	OT-C534-FLINE-NG	685749.2548	1686126.3534
122	685947.7680	1686606.3420	4101.81	OT-C534-FLINE-NG	685748.9659	1686117.5279
123	685953.2050	1686618.0690	4102.08	OT-C534-ENFLU-NG	685754.4013	1686129.2515
124	685968.5800	1686611.5870	4102.06	OT-C534-ENFLU-NG	685769.7718	1686122.7714
125	686021.5760	1686604.3860	4102.49	OT-C534-ENFLU-NG	685822.7525	1686115.5725
126	686051.0660	1686600.5520	4102.82	OT-C534-ENFLU-NG	685852.2339	1686111.7396
127	682943.9250	1686529.5770	4094.74	OT-C536-STATION1-NG	682745.9934	1686040.7852
128	682925.1900	1686534.9010	4094.63	OT-C536-STATION2-NG	682727.2639	1686046.1076
129	682914.0740	1686530.8350	4094.17	OT-C536-STATION3-NG	682716.1511	1686042.0428
130	682900.2750	1686534.1950	4094.40	MW-OT-C5361-CASING	682702.3561	1686045.4018
131	682900.0410	1686534.2560	4094.03	MW-OT-C5361-PVC	682702.1222	1686045.4628
132	682892.0960	1686514.3610	4094.08	OT-C536-LEACH-NG	682694.1795	1686025.5736
133	682905.9860	1686504.4840	4093.98	OT-C536-LEACH-NG	682708.0654	1686015.6994
134	682914.9460	1686505.2970	4094.10	OT-C536-LEACH-NG	682717.0228	1686016.5122
135	682919.4610	1686521.1490	4094.40	OT-C536-LEACH-NG	682721.5365	1686032.3596
136	682921.1340	1686534.7310	4094.42	OT-C536-LEACH-NG	682723.2091	1686045.9377
137	682919.5910	1686545.0230	4094.72	OT-C536-LEACH-NG	682721.6665	1686056.2267
138	682912.1700	1686551.2270	4094.60	OT-C536-LEACH-NG	682714.2477	1686062.4289
139	682897.7180	1686551.9240	4094.16	OT-C536-LEACH-NG	682699.7998	1686063.1257
140	682892.5110	1686549.8820	4094.18	OT-C536-LEACH-NG	682694.5943	1686061.0843
141	682922.3680	1686533.4440	4094.42	OT-C536-TANKPIT-NG	682724.4427	1686044.6510
142	682920.9800	1686525.5880	4094.39	OT-C536-TANKPIT-NG	682723.0551	1686036.7973
143	682928.0220	1686524.4280	4094.63	OT-C536-TANKPIT-NG	682730.0951	1686035.6377
144	682929.2370	1686532.7090	4094.62	OT-C536-TANKPIT-NG	682731.3097	1686043.9163
145	682949.7020	1686528.9800	4094.75	OT-C536-ENFLU-NG	682751.7688	1686040.1883
146	682921.2900	1686528.9090	4094.41	OT-C536-ENFLU-NG	682723.3650	1686040.1174
147	682916.2970	1686530.1310	4094.27	OT-C536-ENFLU-NG	682718.3735	1686041.3390
148	682877.6850	1686739.3620	4095.03	OT-C533-MW-CASING	682679.7726	1686250.5094
149	682877.4490	1686739.4350	4094.68	OT-C533-MW-PVC	682679.5367	1686250.5823
150	682884.2550	1686735.8390	4094.76	OT-C533-LEACH-NG	682686.3407	1686246.9874
151	682877.4700	1686734.1690	4094.84	OT-C533-LEACH-NG	682679.5577	1686245.3179

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
152	682871.6400	1686736.6530	4094.83	OT-C533-LEACH-NG	682673.7294	1686247.8011
153	682869.4200	1686738.9370	4094.89	OT-C533-LEACH-NG	682671.5100	1686250.0845
154	682868.8760	1686741.4810	4094.99	OT-C533-LEACH-NG	682670.9662	1686252.6277
155	682867.8710	1686756.1100	4095.03	OT-C533-LEACH-NG	682669.9615	1686267.2525
156	682857.6950	1686766.0680	4095.35	OT-C533-LEACH-NG	682659.7884	1686277.2076
157	682855.8760	1686772.9280	4095.39	OT-C533-LEACH-NG	682657.9700	1686284.0656
158	682855.6590	1686783.4130	4095.46	OT-C533-LEACH-NG	682657.7530	1686294.5476
159	682855.5230	1686790.0690	4095.47	OT-C533-LEACH-NG	682657.6171	1686301.2017
160	682857.2270	1686794.8730	4095.42	OT-C533-LEACH-NG	682659.3206	1686306.0043
161	682858.6900	1686813.7880	4095.55	OT-C533-LEACH-NG	682660.7832	1686324.9138
162	682867.9360	1686816.7350	4095.32	OT-C533-LEACH-NG	682670.0265	1686327.8599
163	682880.0660	1686814.6740	4095.00	OT-C533-LEACH-NG	682682.1530	1686325.7995
164	682891.9700	1686818.7840	4094.82	OT-C533-LEACH-NG	682694.0535	1686329.9083
165	682901.1340	1686806.7570	4094.86	OT-C533-LEACH-NG	682703.2148	1686317.8848
166	682889.7110	1686785.0140	4094.98	OT-C533-LEACH-NG	682691.7952	1686296.1481
167	682889.3190	1686757.8750	4094.96	OT-C533-LEACH-NG	682691.4033	1686269.0170
168	682886.6550	1686745.7080	4094.83	OT-C533-LEACH-NG	682688.7400	1686256.8535
169	682895.8900	1686814.7130	4095.19	OT-C533-FFLUEN-NG	682697.9724	1686325.8385
170	682901.8890	1686814.2530	4095.86	OT-C533-FFLUEN-TPAD	682703.9696	1686325.3787
171	682901.5970	1686811.8220	4095.84	OT-C533-SEPTIC-TCONC	682703.6777	1686322.9484
172	682911.5820	1686810.3750	4095.77	OT-C533-SEPTIC-TCONC	682713.6598	1686321.5018
173	682912.4280	1686815.4170	4095.77	OT-C533-SEPTIC-TCONC	682714.5056	1686326.5423
174	682902.3730	1686816.8390	4095.84	OT-C533-SEPTIC-TCONC	682704.4535	1686327.9639
175	682912.0910	1686812.7560	4095.77	OT-C533-EFLUEN-TCONC	682714.1687	1686323.8821
176	682923.3600	1686810.9450	4095.29	OT-C533-EFLUEN-NG	682725.4344	1686322.0716
177	682942.2940	1686810.3140	4095.49	OT-C533-EFLUEN-NG	682744.3629	1686321.4408
178	682937.5080	1686805.9000	4095.30	OT-C533-STATION1-NG	682739.5783	1686318.0278
179	682906.2780	1686808.8380	4094.86	OT-C533-STATION2-NG	682708.3574	1686319.9652
180	682895.2770	1686813.2080	4094.98	OT-C533-STATION3-NG	682697.3595	1686324.3340
181	700191.9570	1695605.3730	4181.72	OT-C540-STATION1-ASP	699989.0266	1695113.9508
182	700173.9260	1695611.2520	4181.82	OT-C540-STATION2-NG	699971.0008	1695119.8281
183	700168.8930	1695604.5390	4181.39	OT-C540-STATION3-NG	699965.9693	1695113.1170
184	700151.2700	1695598.6630	4180.49	OT-C540-STATION4-NG	699948.3514	1695107.2427
185	700158.9630	1695593.9090	4180.86	OT-C540-LEACH-NG	699956.0422	1695102.4901
186	700150.2560	1695603.0840	4180.78	OT-C540-LEACH-NG	699947.3377	1695111.6625
187	700152.8330	1695609.6400	4180.81	OT-C540-LEACH-NG	699949.9139	1695118.2166
188	700155.1660	1695611.7200	4180.89	OT-C540-LEACH-NG	699952.2463	1695120.2960
189	700161.1020	1695611.3470	4181.11	OT-C540-LEACH-NG	699958.1805	1695119.9231
190	700163.7200	1695601.1600	4181.06	OT-C540-LEACH-NG	699960.7978	1695109.7390
191	700161.5790	1695596.1920	4181.05	OT-C540-LEACH-NG	699958.6574	1695104.7725
192	700165.7400	1695603.7570	4181.48	OT-C540-FFLUEN-NG	699962.8172	1695112.3353
193	700170.8520	1695608.8530	4181.93	OT-C540-FFLUEN-NG	699967.9277	1695117.4298
194	700170.7290	1695606.7600	4182.01	OT-C540-SEPTIC-NG	699967.8048	1695115.3374
195	700176.8760	1695605.4490	4181.91	OT-C540-SEPTIC-NG	699973.9500	1695114.0268
196	700177.5910	1695612.4300	4181.92	OT-C540-SEPTIC-NG	699974.6648	1695121.0058
197	700172.1930	1695613.9030	4182.05	OT-C540-SEPTIC-NG	699969.2683	1695122.4783
198	700177.7030	1695608.9790	4181.69	OT-C540-EFLUEN-NG	699974.7767	1695117.5558
199	700205.8220	1695608.1850	4181.85	OT-C540-EFLUEN-ASPH	700002.8876	1695116.7620
200	700246.4300	1695613.4690	4182.95	OT-C540-EFLUEN-ASPH	700043.4838	1695122.0445
201	700238.4930	1695614.0360	4182.51	OT-C540-BLDGCOR	700035.5491	1695122.6113
202	700228.4390	1695608.1640	4182.55	OT-C540-BLDGCOR	700025.4980	1695116.7410
203	700227.0510	1695568.0300	4182.87	OT-C540-BLDGCOR	700024.1104	1695076.6186
204	700236.9380	1695557.6950	4183.02	OT-C540-BLDGCOR	700033.9946	1695066.2866
205	688305.7410	1690609.5510	4126.46	TU\US-C507-STATION1-	688106.2555	1690119.5767
206	688309.7220	1690614.0760	4126.51	TU\US-C507-STATION2-	688110.2353	1690124.1004
207	688306.7130	1690619.4150	4126.45	TU\US-C507-STATION3-	688107.2272	1690129.4378
208	688313.7000	1690621.8280	4126.37	TU\US-C507-STATION4-	688114.2122	1690131.8501
209	688313.7950	1690607.6410	4126.36	TU\US-C507-STATION5-	688114.3071	1690117.6673
210	688304.0140	1690620.9730	4126.47	TU\US-C507-USTPIT-AS	688104.5290	1690130.9954
211	688304.3040	1690607.3010	4126.54	TU\US-C507-USTPIT-AS	688104.8189	1690117.3274
212	688317.4320	1690607.1780	4126.54	TU\US-C507-USTPIT-AS	688117.9431	1690117.2044
213	688317.6000	1690622.2860	4126.57	TU\US-C507-USTPIT-AS	688118.1110	1690132.3080
214	688320.7590	1690623.9670	4127.18	TU\US-C507-BLDGCOR	688121.2691	1690133.9885
215	688330.7630	1690627.7570	4125.65	TU\US-C507-BLDGCOR	688131.2702	1690137.7774
216	688318.5520	1690598.7120	4126.71	TU\US-C507-BLDGCOR	688119.0628	1690108.7408
217	688306.5580	1690598.9520	4126.69	TU\US-C507-BLDGCOR	688107.0722	1690108.9808
218	688287.5740	1690592.3200	4126.83	TU\US-C507-EXMW1	688088.0937	1690102.3507
219	688287.4600	1690625.9270	4126.36	TU\US-C507-EXMW2	688087.9798	1690135.9480
220	689216.8690	1680453.8850	4087.76	TU\US-C501-STATION4-	689017.1194	1679966.8540
221	689203.4000	1680450.4300	4087.80	TU\US-C501-STATION1-	689003.6543	1679963.4000
222	689227.9170	1680449.2880	4087.78	TU\US-C501-STATION2-	689028.1642	1679962.2584

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
223	689201.2820	1680437.6020	4087.96	TU\US-C501-STATION3-	689001.5369	1679950.5757
224	689204.0090	1680426.7550	4087.80	TU\US-C501-STATION5-	689004.2631	1679939.7319
225	689200.5240	1680440.6650	4087.95	TU\US-C501-BLDGCOR-N	689000.7792	1679953.6379
226	689191.1430	1680432.8740	4088.07	TU\US-C501-BLDGCOR-N	688991.4009	1679945.8491
227	689202.0960	1680449.8730	4087.79	TU\US-C501-TANKPIT-N	689002.3507	1679962.8432
228	689201.5860	1680440.8210	4087.99	TU\US-C501-TANKPIT-N	689001.8408	1679953.7938
229	689191.7450	1680432.9310	4088.07	TU\US-C501-TANKPIT-N	688992.0027	1679945.9061
230	689195.4710	1680423.1750	4087.88	TU\US-C501-TANKPIT-N	688995.7276	1679936.1529
231	689207.1960	1680422.4490	4087.92	TU\US-C501-TANKPIT-N	689007.4492	1679935.4271
232	689229.2900	1680431.3210	4087.77	TU\US-C501-TANKPIT-N	689029.5368	1679944.2966
233	689231.6150	1680444.1310	4087.67	TU\US-C501-TANKPIT-N	689031.8611	1679957.1029
234	689227.5450	1680454.7320	4087.83	TU\US-C501-TANKPIT-N	689027.7923	1679967.7008
235	689218.0540	1680463.3780	4088.03	TU\US-C501-TANKPIT-N	689018.3041	1679976.3443
236	689209.0460	1680458.6260	4087.92	TU\US-C501-TANKPIT-N	689009.2987	1679971.5937
237	689237.1630	1680445.1670	4087.64	TU\US-C501-COMMLINE-	689037.4075	1679958.1386
238	689219.6050	1680436.9770	4088.00	TU\US-C501-COMMLINE-	689019.8546	1679949.9509
239	689199.7540	1680431.6770	4088.06	TU\US-C501-COMMLINE-	689000.0094	1679944.6525
240	689181.3550	1680425.0490	4088.20	TU\US-C501-COMMLINE-	688981.6157	1679938.0264
241	689162.6180	1680417.3900	4088.35	TU\US-C501-COMMLINE-	688962.8841	1679930.3696
242	689161.5970	1680417.5650	4088.56	TU\US-C501-COMMVAULT	688961.8634	1679930.5446
243	689157.8580	1680421.3400	4088.11	TU\US-C501-COMMVAULT	688958.1255	1679934.3185
244	689150.8680	1680414.5760	4088.10	TU\US-C501-COMMVAULT	688951.1375	1679927.5564
245	689154.6050	1680410.8830	4088.46	TU\US-C501-COMMVAULT	688954.8735	1679923.8645
246	687246.6430	1686873.0010	4105.82	OT-C535-STATION1-NG	687047.4644	1686384.1096
247	687270.5400	1686861.6690	4105.63	OT-C535-STATION2-NG	687071.3545	1686372.7809
248	687282.8340	1686866.7860	4105.85	OT-C535-STATION3-NG	687083.6449	1686377.8964
249	687303.5940	1686788.5490	4105.12	OT-C535-STATION4-NG	687104.3989	1686299.6821
250	687291.9640	1686793.7970	4105.27	OT-C535-LEACH-NG	687092.7723	1686304.9286
251	687304.7930	1686782.8770	4105.17	OT-C535-LEACH-NG	687105.5976	1686294.0117
252	687323.6740	1686798.1880	4105.34	OT-C535-LEACH-NG	687124.4731	1686309.3183
253	687319.7080	1686817.5380	4105.82	OT-C535-LEACH-NG	687120.5083	1686328.6627
254	687307.4400	1686838.9610	4105.76	OT-C535-LEACH-NG	687108.2438	1686350.0795
255	687297.0830	1686856.5380	4106.04	OT-C535-LEACH-NG	687097.8898	1686367.6514
256	687290.0540	1686837.9200	4105.59	OT-C535-LEACH-NG	687090.8628	1686349.0388
257	687291.3760	1686806.0200	4105.33	OT-C535-LEACH-NG	687092.1845	1686317.1480
258	687284.5890	1686864.5150	4106.11	OT-C535-FFLUEN-NG	687085.3994	1686375.6261
259	687276.8290	1686868.4490	4106.19	OT-C535-FFLUEN-NG	687077.6417	1686379.5589
260	687276.0820	1686870.8490	4106.28	OT-C535-SEPTIC-NG	687076.8949	1686381.9583
261	687263.3720	1686869.7190	4105.87	OT-C535-SEPTIC-NG	687064.1886	1686380.8286
262	687263.7200	1686863.5770	4105.95	OT-C535-SEPTIC-NG	687064.5365	1686374.6884
263	687276.4840	1686862.8870	4106.07	OT-C535-SEPTIC-NG	687077.2968	1686373.9986
264	687263.5270	1686868.1150	4105.92	OT-C535-EFLUEN-NG	687064.3435	1686379.2250
265	687228.9570	1686874.1570	4105.71	OT-C535-EFLUEN-NG	687029.7836	1686385.2653
266	687235.2230	1686881.4610	4106.05	OT-C535-BLDGCOR-NG	687036.0477	1686392.5672
267	687225.9150	1686892.3360	4105.90	OT-C535-BLDGCOR-NG	687026.7424	1686403.4390
268	687232.0250	1686844.5370	4105.92	OT-C535-BLDGCOR-NG	687032.8507	1686355.6539
269	687221.4890	1686835.3400	4105.63	OT-C535-BLDGCOR-NG	687022.3177	1686346.4595
270	677637.2460	1692755.6660	4110.24	TU/US-C505-MW1-CASIN	677440.8524	1692265.0697
271	677636.9990	1692755.6590	4109.84	TU/US-C505-MW1-PVC	677440.6055	1692265.0627
272	677634.4160	1692722.3930	4110.42	TU/US-C505-WELLATEMP	677438.0233	1692231.8064
273	677659.4620	1692742.2400	4110.34	TU/US-C505-WELLATEMP	677463.0620	1692251.6476
274	677701.9500	1692799.3200	4110.17	TU/US-C505-USTPIT-NG	677505.5377	1692308.7111
275	677701.3830	1692789.3010	4110.35	TU/US-C505-USTPIT-NG	677504.9708	1692298.6950
276	677711.5570	1692789.5280	4110.64	TU/US-C505-USTPIT-NG	677515.1419	1692298.9219
277	677710.8940	1692799.1130	4110.24	TU/US-C505-USTPIT-NG	677514.4791	1692308.5041
278	677707.4060	1692790.0820	4110.35	TU/US-C505-STATION1-	677510.9921	1692299.4757
279	677702.3100	1692795.0710	4110.20	TU/US-C505-STATION2-	677505.8976	1692304.4633
280	677705.6610	1692797.9500	4110.13	TU/US-C505-STATION3-	677509.2476	1692307.3415
281	677710.4770	1692793.8740	4110.09	TU/US-C505-STATION4-	677514.0622	1692303.2666
282	677706.4200	1692793.8350	4110.12	TU/US-C505-STATION5-	677510.0064	1692303.2276
283	677694.5060	1692779.7220	4110.88	TU/US-C505-BLDGCOR-N	677498.0958	1692289.1187
284	677704.1940	1692790.4680	4110.28	TU/US-C505-BLDGCOR-N	677507.7810	1692299.8616
285	677754.5670	1692783.0890	4110.79	TU/US-C505-BLDGCOR-N	677558.1394	1692292.4848
286	677743.8570	1692795.1680	4110.70	TU/US-C505-BLDGCOR-N	677547.4325	1692304.5603
287	686300.2320	1672933.0350	4060.98	OT-C542-MW-CASING-	686101.3277	1672448.1837
288	686300.2350	1672933.0550	4060.98	OT-C542-MW-PVC	686101.3307	1672448.2037
289	686274.4020	1672914.6520	4061.01	OT-C542-LEACH-NG	686075.5052	1672429.8061
290	686289.6710	1672938.5250	4060.76	OT-C542-LEACH-NG	686090.7698	1672453.6721
291	686294.6900	1672941.1720	4060.83	OT-C542-LEACH-NG	686095.7873	1672456.3184
292	686301.6970	1672938.9490	4060.85	OT-C542-LEACH-NG	686102.7923	1672454.0960
293	686305.7170	1672936.2850	4060.87	OT-C542-LEACH-NG	686106.8111	1672451.4328

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
294	686308.0670	1672931.0550	4060.89	OT-C542-LEACH-NG	686109.1604	1672446.2043
295	686304.8000	1672917.9090	4060.82	OT-C542-LEACH-NG	686105.8944	1672433.0621
296	686292.3740	1672901.2590	4060.90	OT-C542-LEACH-NG	686093.4720	1672416.4169
297	686283.4190	1672906.7050	4060.97	OT-C542-FFLUEN-NG	686084.5196	1672421.8614
298	686280.3770	1672902.6520	4060.94	OT-C542-FFLUEN-NG	686081.4785	1672417.8095
299	686276.9070	1672904.6420	4060.95	OT-C542-SEPTIC-NG	686078.0095	1672419.7990
300	686271.2980	1672896.9550	4060.80	OT-C542-SEPTIC-NG	686072.4021	1672412.1142
301	686281.9530	1672889.9350	4060.83	OT-C542-SEPTIC-NG	686083.0540	1672405.0962
302	686287.0950	1672896.6800	4060.88	OT-C542-SEPTIC-NG	686088.1945	1672411.8393
303	686285.7900	1672894.7150	4060.83	OT-C542-EFLUEN-NG	686086.8899	1672409.8748
304	686299.2270	1672887.1560	4060.87	OT-C542-EFLUEN-NG	686100.3230	1672402.3180
305	686310.9860	1672881.5880	4061.18	OT-C542-EFLUEN-NG	686112.0786	1672396.7516
306	686294.2970	1672858.0380	4060.90	OT-C542-BLDGCOR-NG	686095.3944	1672373.2085
307	686295.8820	1672844.1310	4061.28	OT-C542-BLDGCOR-NG	686096.9790	1672359.3055
308	686345.1390	1672922.4560	4060.89	OT-C542-BLDGCOR-NG	686146.2217	1672437.6078
309	686358.9780	1672924.0940	4061.42	OT-C542-BLDGCOR-NG	686160.0567	1672439.2453
310	686291.8860	1672885.1500	4060.65	OT-C542-STATION1-NG	686092.9841	1672400.3126
311	686275.2730	1672891.5340	4060.63	OT-C542-STATION2-NG	686076.3760	1672406.6948
312	686281.5390	1672904.6340	4060.73	OT-C542-STATION2-NG	686082.6401	1672419.7910
313	685750.1690	1671530.2910	4055.60	OT-C543-STATION2-NG	685551.4241	1671045.8463
314	685734.0730	1671548.8090	4055.84	OT-C543-STATION2	685535.3328	1671064.3589
315	685727.7350	1671514.3350	4055.33	OT-C543-STATION3	685528.9966	1671029.8949
316	685749.4390	1671546.6740	4055.91	OT-C543-EXSEPTIC	685550.6944	1671062.2245
317	685732.6430	1671545.5190	4055.74	OT-C543-EXSEPTIC	685533.9032	1671061.0699
318	685741.2600	1671557.0720	4056.32	OT-C543-EXSEPTIC	685542.5177	1671072.6195
319	685738.1510	1671537.7290	4055.62	OT-C543-EXSEPTIC	685539.4096	1671053.2821
320	685734.3520	1671541.2760	4055.65	OT-C543-FFLUEN	685535.6117	1671056.8281
321	685716.0920	1671515.5090	4055.04	OT-C543-FFLUEN	685517.3570	1671031.0686
322	685708.2650	1671520.5800	4055.23	OT-C543-LEACH	685509.5323	1671036.1381
323	685688.3040	1671512.0560	4055.52	OT-C543-LEACH	685489.5771	1671027.6166
324	685669.5610	1671502.3840	4055.36	OT-C543-LEACH	685470.8395	1671017.9474
325	685659.9210	1671495.2130	4055.04	OT-C543-LEACH	685461.2023	1671010.7784
326	685670.4020	1671495.5660	4055.43	OT-C543-MW-CASING	685471.6803	1671011.1313
327	685670.1370	1671495.6580	4055.13	OT-C543-MW-PVC	685471.4153	1671011.2233
328	685682.2550	1671485.7460	4055.16	OT-C543-LEACH	685483.5298	1671001.3142
329	685699.8070	1671491.2750	4054.76	OT-C543-LEACH	685501.0767	1671006.8416
330	685710.4840	1671499.0550	4055.06	OT-C543-LEACH	685511.7506	1671014.6193
331	685721.5030	1671508.4730	4055.40	OT-C543-LEACH	685522.7664	1671024.0346
332	685794.8190	1671498.3320	4056.84	OT-C543-EFLUEN	685596.0612	1671013.8965
333	685809.3600	1671495.0820	4059.27	OT-C543-BLDGCOR	685610.5980	1671010.6475
334	685776.9050	1671465.9090	4060.02	OT-C543-BLDGCOR	685578.1524	1670981.4829
335	685785.4230	1671455.8900	4060.26	OT-C543-BLDGCOR	685586.6679	1670971.4668
336	685744.8400	1671542.1950	4055.76	OT-C543-EFLUEN	685546.0967	1671057.7468
337	685303.6520	1671072.3550	4048.79	OT-C544-MW-CASING	685105.0365	1670588.0430
338	685303.3550	1671072.2840	4048.52	OT-C544-MW-PVC	685104.7396	1670587.9720
339	685349.4970	1671083.9730	4052.43	OT-C544-STATION1	685150.8683	1670599.6576
340	685342.4960	1671086.5980	4051.55	OT-C544-STATION1	685143.8693	1670602.2819
341	685336.0530	1671085.0120	4050.99	OT-C544-STATION1	685137.4282	1670600.6963
342	685336.7000	1671089.5480	4051.15	OT-C544-SEPTIC	685138.0750	1670605.2310
343	685338.4520	1671075.7050	4051.30	OT-C544-SEPTIC	685139.8265	1670591.3920
344	685347.8050	1671077.3720	4052.23	OT-C544-SEPTIC	685149.1768	1670593.0585
345	685345.6600	1671089.9410	4052.38	OT-C544-SEPTIC	685147.0324	1670605.6239
346	685356.1020	1671079.9660	4041.22	OT-C544-EFLUEN	685157.4713	1670595.6518
347	685347.2700	1671081.8770	4052.36	OT-C544-EFLUEN	685148.6419	1670597.5622
348	685337.4940	1671082.4320	4051.31	OT-C544-FFLUEN	685138.8687	1670598.1171
349	685335.1290	1671082.2690	4051.14	OT-C544-FFLUEN	685136.5044	1670597.9541
350	685336.2280	1671075.8560	4050.85	OT-C544-LEACH	685137.6031	1670591.5430
351	685323.3310	1671071.0830	4049.91	OT-C544-LEACH	685124.7098	1670586.7714
352	685297.8990	1671068.1360	4048.16	OT-C544-LEACH	685099.2852	1670583.8252
353	685296.9990	1671078.2660	4047.94	OT-C544-LEACH	685098.3855	1670593.9523
354	685317.0900	1671090.9580	4049.62	OT-C544-LEACH	685118.4707	1670606.6406
355	685334.6940	1671090.0750	4050.81	OT-C544-LEACH	685136.0696	1670605.7579
356	685360.4020	1671127.4140	4053.89	OT-C544-BLDGCOR	685161.7701	1670643.0860
357	685349.8450	1671114.5020	4052.32	OT-C544-BLDGCOR	685151.2162	1670630.1778
358	685360.3480	1671033.1240	4052.96	OT-C544-BLDGCOR	685161.7161	1670548.8234
359	685371.1230	1671022.2010	4053.70	OT-C544-BLDGCOR	685172.4880	1670537.9035
360	669828.5970	1693339.1960	4077.44	TU/US-C503-STATION1	669634.4665	1692848.4306
361	669823.8520	1693340.4930	4077.30	TU/US-C503-STATION2	669629.7229	1692849.7272
362	669816.1660	1693331.0930	4077.32	TU/US-C503-STATION3	669622.0391	1692840.3299
363	669804.9830	1693324.1990	4077.14	TU/US-C503-STATION5	669610.8594	1692833.4379
364	669830.2120	1693344.6950	4077.63	TU/US-C503-STATION4	669636.0811	1692853.9280

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
365	669820.3680	1693343.5050	4078.10	TU/US-C503-USTTANK	669626.2399	1692852.7383
366	669826.9160	1693337.2450	4077.78	TU/US-C503-USTTANK	669632.7860	1692846.4802
367	669831.7020	1693342.9300	4077.73	TU/US-C503-USTTANK	669637.5706	1692852.1635
368	669817.5060	1693300.2710	4077.28	TU/US-C503-BLDGCOR	669623.3788	1692809.5169
369	669817.0280	1693314.4610	4077.69	TU/US-C503-BLDGCOR	669622.9009	1692823.7028
370	669870.4630	1693326.6030	4077.24	TU/US-C503-BLDGCOR	669676.3204	1692835.8412
371	669857.6770	1693326.9550	4077.12	TU/US-C503-BLDGCOR	669663.5381	1692836.1931
372	669799.9830	1693280.8270	4076.53	TU/US-C503-BLDGCOR	669605.8608	1692790.0785
373	669786.0040	1693280.0690	4077.00	TU/US-C503-BLDGCOR	669591.8859	1692789.3207
374	669753.1970	1693299.5360	4076.55	TU/US-C503-MW1-CASIN	669559.0884	1692808.7821
375	669753.0160	1693299.6510	4076.22	TU/US-C503-MW1-PVC	669558.9075	1692808.8971
376	669717.9520	1693348.6000	4074.92	TU/US-C503-MW3-PVC	669523.8536	1692857.8319
377	669718.0930	1693348.2730	4075.65	TU/US-C503-MW3-CASIN	669523.9946	1692857.5050
378	669746.8950	1693329.2100	4076.92	TU/US-C503-BLDGCOR	669552.7882	1692838.4475
379	669747.5820	1693308.1150	4076.21	TU/US-C503-BLDGCOR	669553.4750	1692817.3586
380	669906.5180	1693361.1640	4077.43	TU/US-C503-MW2-CASIN	669712.3650	1692870.3922
381	669906.2520	1693361.2650	4077.07	TU/US-C503-MW2-PVC	669712.0990	1692870.4932
382	669887.0390	1693344.8910	4077.53	TU/US-C503-BLDGCOR	669692.8916	1692854.1239
383	669886.0230	1693359.0930	4077.99	TU/US-C503-BLDGCOR	669691.8759	1692868.3218
384	670862.3470	1691695.2520	4072.78	TU/US-C500-MW1-CASIN	670667.9169	1691204.9630
385	670862.1340	1691695.4850	4072.39	TU/US-C500-MW1-PVC	670667.7040	1691205.1960
386	670897.1420	1691671.0590	4072.25	TU/US-C500-MW2-PVC	670702.7019	1691180.7771
387	670897.3420	1691670.8340	4072.66	TU/US-C500-MW2-CASIN	670702.9018	1691180.5521
388	670997.2710	1691721.0890	4072.90	TU/US-C500-MW3-CASIN	670802.8018	1691230.7926
389	670996.9840	1691721.2540	4072.41	TU/US-C500-MW3-PVC	670802.5149	1691230.9575
390	670952.1640	1691699.4910	4072.04	TU/US-C500-STATION1	670757.7079	1691209.2008
391	670948.0960	1691682.1740	4072.36	TU/US-C500-STATION4	670753.6411	1691191.8888
392	670936.4590	1691683.8290	4072.05	TU/US-C500-STATION5	670742.0075	1691193.5434
393	670929.6330	1691690.0950	4072.11	TU/US-C500-STATION2	670735.1834	1691199.8075
394	670923.0530	1691673.0510	4072.18	TU/US-C500-STATION3	670728.6054	1691182.7685
395	670946.5050	1691708.7370	4072.40	TU/US-C500-USTPIT	670752.0506	1691218.4441
396	670961.7540	1691693.8260	4072.62	TU/US-C500-USTPIT	670767.2951	1691203.5375
397	670931.1680	1691662.3970	4072.93	TU/US-C500-USTPIT	670736.7180	1691172.1176
398	670915.4940	1691676.4560	4072.43	TU/US-C500-USTPIT	670721.0485	1691186.1725
399	670921.7940	1691667.6910	4072.61	TU/US-C500-BLDGCOR	670727.3467	1691177.4100
400	670938.3020	1691685.3670	4072.19	TU/US-C500-BLDGCOR	670743.8499	1691195.0809
401	670954.8550	1691686.5260	4072.52	TU/US-C500-BLDGCOR	670760.3981	1691196.2396
402	670964.2580	1691691.8600	4072.50	TU/US-C500-BLDGCOR	670769.7984	1691201.5720
403	670981.1410	1691692.8760	4072.84	TU/US-C500-BLDGCOR	670786.6765	1691202.5877
404	681138.2190	1690535.4430	4109.80	OT-C538-MW1-CASING	680940.8108	1690045.4902
405	681137.9660	1690535.5040	4109.43	OT-C538-MW1-PVC	680940.5579	1690045.5512
406	681154.3000	1690506.8540	4109.64	OT-C538-STATION3	680956.8871	1690016.9095
407	681170.7650	1690504.3700	4110.30	OT-C538-STATION2	680973.3473	1690014.4262
408	681207.7160	1690542.9160	4110.07	OT-C538-STATION1	681010.2876	1690052.9610
409	681171.2020	1690513.1430	4110.35	OT-C538-SEPTIC	680973.7842	1690023.1966
410	681160.8350	1690514.8700	4110.22	OT-C538-SEPTIC	680963.4202	1690024.9231
411	681157.5830	1690502.2430	4109.87	OT-C538-SEPTIC	680960.1692	1690012.2998
412	681168.6240	1690500.8410	4110.30	OT-C538-SEPTIC	680971.2070	1690010.8982
413	681157.7430	1690507.8780	4109.92	OT-C538-FFLUEN	680960.3291	1690017.9332
414	681149.7900	1690513.8560	4109.82	OT-C538-FFLUEN	680952.3784	1690023.9094
415	681146.2870	1690511.1610	4109.76	OT-C538-LEACH	680948.8764	1690021.2152
416	681140.0690	1690516.2140	4109.76	OT-C538-LEACH	680942.6602	1690026.2667
417	681131.8360	1690535.6580	4109.59	OT-C538-LEACH	680934.4296	1690045.7051
418	681142.3480	1690541.6090	4109.45	OT-C538-LEACH	680944.9386	1690051.6544
419	681148.4850	1690524.6340	4109.80	OT-C538-LEACH	680951.0738	1690034.6843
420	681152.9240	1690518.6140	4110.01	OT-C538-LEACH	680955.5115	1690028.6661
421	681171.0630	1690513.0040	4110.32	OT-C538-EFLUEN	680973.6453	1690023.0577
422	681199.3120	1690534.6340	4109.92	OT-C538-EFLUEN	681001.8861	1690044.6814
423	681311.9210	1690619.8910	4111.94	OT-C538-EFLUEN	681114.4624	1690129.9137
424	681378.0600	1690614.8720	4112.52	OT-C538-EFLUEN	681180.5823	1690124.8962
425	681511.9950	1690621.0250	4112.35	OT-C538-EFLUEN-C/O	681314.4785	1690131.0474
426	681543.8210	1690614.3290	4112.13	OT-C538-EFLUEN-C/O	681346.2952	1690124.3533
427	681545.1500	1690624.0320	4110.59	OT-C538-EFLUEN	681347.6238	1690134.0535
428	681526.9290	1690617.7410	4112.19	OT-C538-BLDGCOR	681329.4081	1690127.7643
429	681516.5600	1690627.6780	4112.22	OT-C538-BLDGCOR	681319.0421	1690137.6984
430	681517.0030	1690674.6590	4112.55	OT-C538-BLDGCOR	681319.4850	1690184.6658
431	681526.9640	1690685.0850	4112.68	OT-C538-BLDGCOR	681329.4431	1690195.0888
432	681610.3380	1690617.1910	4112.15	OT-C538-BLDGCOR	681412.7929	1690127.2145
433	681620.0290	1690626.9090	4112.29	OT-C538-BLDGCOR	681422.4811	1690136.9297
434	681248.7970	1690511.7190	4110.11	OT-C537-STATION1	681051.3567	1690021.7731
435	681230.2540	1690505.9940	4109.96	OT-C537-STATION2	681032.8191	1690016.0497

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
436	681220.0430	1690509.7920	4110.12	OT-C537-STATION3	681022.6111	1690019.8466
437	681224.9030	1690501.6020	4109.95	OT-C537-SEPTICDRY	681027.4697	1690011.6590
438	681224.2220	1690518.0560	4110.28	OT-C537-SEPTICDRY	681026.7889	1690028.1082
439	681236.7540	1690518.9910	4110.31	OT-C537-SEPTICDRY	681039.3172	1690029.0429
440	681236.4080	1690501.8520	4110.13	OT-C537-SEPTICDRY	681038.9713	1690011.9089
441	681237.2180	1690508.8330	4110.12	OT-C537-INLINE	681039.7811	1690018.8879
442	681311.7430	1690515.4440	4111.03	OT-C537-INLINE	681114.2845	1690025.4970
443	670561.7210	1680587.5740	4050.10	TU/US-C506-MW2-CASIN	670367.3781	1680100.5043
444	670561.4170	1680587.6760	4049.68	TU/US-C506-MW2-PVC	670367.0742	1680100.6062
445	670504.3430	1680580.0920	4050.14	TU/US-C506-MW1-PVC	670310.0167	1680093.0244
446	670504.5340	1680580.0020	4050.56	TU/US-C506-MW1-CASIN	670310.2076	1680092.9345
447	670508.2600	1680580.6030	4050.26	TU/US-C506-USTTANK	670313.9326	1680093.5353
448	670507.1490	1680575.9500	4050.27	TU/US-C506-USTTANK	670312.8219	1680088.8836
449	670517.9280	1680578.9030	4050.27	TU/US-C506-USTTANK	670323.5978	1680091.8358
450	670517.4300	1680574.2280	4050.28	TU/US-C506-USTTANK	670323.0999	1680087.1621
451	670507.9350	1680578.1630	4050.18	TU/US-C506-STATION1	670313.6077	1680091.0960
452	670513.3690	1680579.8330	4050.20	TU/US-C506-STATION2	670319.0401	1680092.7655
453	670517.9640	1680576.4150	4050.25	TU/US-C506-STATION3	670323.6338	1680089.3485
454	670511.2330	1680575.3810	4050.12	TU/US-C506-STATION4	670316.9047	1680088.3148
455	670512.5770	1680577.6370	4050.16	TU/US-C506-STATION5	670318.2483	1680090.5702
456	670485.1820	1680557.6150	4050.53	TU/US-C506-EXMW1-CAS	670290.8613	1680070.5540
457	670484.8980	1680557.6790	4050.38	TU/US-C506-EXMW1-PVC	670290.5773	1680070.6179
458	670494.8180	1680553.5430	4050.36	TU/US-C506-BLDGCOR	670300.4945	1680066.4831
459	670506.7310	1680561.7710	4050.38	TU/US-C506-BLDGCOR	670312.4040	1680074.7088
460	670510.1770	1680607.5970	4050.36	TU/US-C506-BLDGCOR	670315.8490	1680120.5215
461	670507.2460	1680618.1900	4050.39	TU/US-C506-BLDGCOR	670312.9189	1680131.1114
462	672564.5350	1692766.5990	4084.67	OT-C530-STATION1	672369.6116	1692275.9995
463	672567.1650	1692774.7240	4084.79	OT-C530-STATION2	672372.2409	1692284.1222
464	672567.5210	1692771.2850	4084.93	OT-C530-ACTSEPTIC	672372.5967	1692280.6842
465	672572.0780	1692767.3740	4084.89	OT-C530-ACTSEPTIC	672377.1524	1692276.7743
466	672575.8660	1692771.9070	4084.91	OT-C530-ACTSEPTIC	672380.9393	1692281.3060
467	672571.4280	1692775.8290	4084.95	OT-C530-ACTSEPTIC	672376.5026	1692285.2269
468	672569.6900	1692769.3550	4084.91	OT-C530-INLINE	672374.7651	1692278.7547
469	672563.6000	1692772.1360	4084.83	OT-C530-MW-CASING	672368.6769	1692281.5349
470	672563.2920	1692772.2960	4084.49	OT-C530-MW-PVC	672368.3690	1692281.6949
471	672509.9810	1692700.4750	4085.41	OT-C530-INLINE	672315.0734	1692209.8947
472	672538.3940	1692677.7240	4085.37	OT-C530-BLDGCOR	672343.4782	1692187.1503
473	672538.9710	1692663.8680	4085.27	OT-C530-BLDGCOR	672344.0550	1692173.2983
474	672478.3960	1692731.8290	4085.45	OT-C530-BLDGCOR	672283.4976	1692241.2396
475	672485.2490	1692739.1720	4085.12	OT-C530-BLDGCOR	672290.3486	1692248.5805
476	685978.3640	1686617.0530	4101.95	OT-C534-STATION1	685779.5530	1686128.2358
477	685949.9370	1686623.2970	4101.80	OT-C534-STATION2	685751.1342	1686134.4780
478	686041.6810	1686591.0650	4102.58	OT-C534-BLDGCOR	685842.8517	1686102.2553
479	686050.4200	1686580.6970	4102.78	OT-C534-BLDGCOR	685851.5881	1686091.8903
480	686053.7100	1686616.8100	4102.90	OT-C534-BLDGCOR	685854.8772	1686127.9929
481	686043.1140	1686607.6280	4102.82	OT-C534-BLDGCOR	685844.2842	1686118.8135
482	670482.5190	1680558.2400	4050.60	TU/US-C506-MW3-CASIN	670288.1990	1680071.1788
483	670482.3210	1680558.1750	4050.11	TU/US-C506-MW3-PVC	670288.0011	1680071.1138
484	669451.6250	1685381.2210	4054.88	TU/US-C515-STATION1	669257.6038	1684892.7620
485	669456.5920	1685373.9060	4054.66	TU/US-C515-STATION2	669262.5694	1684885.4491
486	669447.7270	1685364.3830	4054.13	TU/US-C515-STATION3	669253.7069	1684875.9289
487	669442.7430	1685375.3260	4054.34	TU/US-C515-STATION4	669248.7244	1684886.8687
488	669450.0780	1685373.9310	4054.62	TU/US-C515-STATION5	669256.0572	1684885.4741
489	669529.8630	1685390.3120	4053.57	TU/US-C515-MW3-PVC	669335.8191	1684901.8503
490	669530.0710	1685390.1630	4053.84	TU/US-C515-MW3-CASIN	669336.0271	1684901.7014
491	669347.3380	1685357.3580	4053.37	TU/US-C515-MW2-CASIN	669153.3470	1684868.9059
492	669347.0390	1685357.4240	4052.93	TU/US-C515-MW2-PVC	669153.0481	1684868.9719
493	669367.7310	1685396.1250	4053.43	TU/US-C515-MW1-PVC	669173.7341	1684907.6617
494	669368.0180	1685396.0880	4053.86	TU/US-C515-MW1-CASIN	669174.0210	1684907.6247
495	669413.7390	1685386.4140	4054.97	TU/US-C515-BLDGCOR	669219.7288	1684897.9535
496	669405.0760	1685397.5400	4056.39	TU/US-C515-BLDGCOR	669211.0683	1684909.0762
497	669442.6490	1685383.8010	4054.90	TU/US-C515-TANKPIT	669248.6304	1684895.3412
498	669458.4310	1685381.6630	4055.08	TU/US-C515-TANKPIT	669264.4078	1684893.2039
499	669454.7400	1685363.6010	4054.47	TU/US-C515-TANKPIT	669260.7179	1684875.1471
500	669440.8050	1685364.3540	4054.07	TU/US-C515-TANKPIT	669246.7869	1684875.8999
501	669474.3460	1685377.9770	4054.82	TU/US-C515-BLDGCOR	669280.3182	1684889.5189
502	669485.4880	1685386.3880	4055.07	TU/US-C515-BLDGCOR	669291.4570	1684897.9275
503	669257.8420	1685415.0700	4053.20	TU/US-C513-STATION3	669063.8770	1684926.6012
504	669241.6200	1685431.8260	4053.43	TU/US-C513-STATION2	669047.6597	1684943.3523
505	669234.6840	1685421.2410	4053.75	TU/US-C513-STATION5	669040.7257	1684932.7704
506	669232.2550	1685409.8190	4053.42	TU/US-C513-STATION4	669038.2974	1684921.3517

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

Corrections

Point #515
TU/US-515-MW3 PVC

Point #518
TU/US-515-MW2

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
507	669220.1400	1685422.8010	4053.52	TU/US-C513-STATION1	669026.1859	1684934.3299
508	669222.4590	1685431.2530	4053.64	TU/US-C513-TANKPIT	669028.5042	1684942.7795
509	669219.3990	1685411.0450	4054.92	TU/US-C513-TANKPIT	669025.4451	1684922.5773
510	669260.7320	1685426.0370	4053.70	TU/US-C513-TANKPIT	669066.7661	1684937.5650
511	669277.6950	1685433.5720	4053.31	TU/US-C513-MW2-CASIN	669083.7242	1684945.0978
512	669243.5650	1685418.8110	4054.36	TU/US-C513-TRANSPAD	669049.6041	1684930.3411
513	669236.4970	1685419.8090	4054.30	TU/US-C513-TRANSPAD	669042.5381	1684931.3388
514	669235.5680	1685411.9050	4054.57	TU/US-C513-TRANSPAD	669041.6094	1684923.4371
515	669277.6850	1685433.6210	4053.26	TU/US-C513-MW2-C[illegible] PVC	669083.7142	1684945.1468 → MW3
516	669188.9570	1685441.5400	4053.76	TU/US-C513-MW1-CASIN	668995.0119	1684953.0635
517	669188.7180	1685441.6230	4053.31	TU/US-C513-MW1-PVC	668994.7730	1684953.1465
518	669175.0530	1685411.5360	4053.78	TU/US-C513-MW3-PVC	668981.1120	1684923.0682 → MW2
519	669175.2900	1685411.4450	4054.15	TU/US-C513-MW3-CASIN	668981.3489	1684922.9772
520	669194.6820	1685411.4540	4054.72	TU/US-C513-BLDGCOR	669000.7353	1684922.9862
521	669205.8290	1685420.1440	4054.47	TU/US-C513-BLDGCOR	669011.8790	1684931.6737
522	669292.6520	1685418.3920	4053.83	TU/US-C513-BLDGCOR	669098.6769	1684929.9222
523	669293.9380	1685428.2990	4053.77	TU/US-C513-BLDGCOR	669099.9625	1684939.8263
524	685879.9040	1686627.7590	4102.02	OTC-534-CASING	685681.1215	1686138.9387
525	685879.6290	1686627.7910	4101.61	OTC-534-PVC	685680.8466	1686138.9707
526	685894.0510	1686651.2940	4102.15	OTC-534-MW6-CASING	685695.2644	1686162.4669
527	685893.7240	1686651.3020	4101.74	OTC-534-MW6-PVC	685694.9375	1686162.4749
528	685866.3710	1686655.8860	4101.59	OTC-534-MW8-PVC	685667.5925	1686167.0576
529	685866.6060	1686655.6520	4102.06	OTC-534-MW8-CASING	685667.8274	1686166.8236
530	685876.1160	1686687.3140	4102.11	OTC-534-MW5-CASING	685677.3346	1686198.4764
531	685875.8760	1686687.4250	4101.81	OTC-534-MW5-PVC	685677.0947	1686198.5874
532	685834.9910	1686704.4610	4101.83	OTC-534-MW9-PVC	685636.2216	1686215.6185
533	685835.2820	1686704.5300	4102.15	OTC-534-MW9-CASING	685636.5125	1686215.6875
534	685772.4780	1686595.2240	4101.45	OTC-534-MW10-NG	685573.7267	1686106.4131
535	669081.1480	1678793.1860	4046.72	OTC-531B-SEPTANK	668887.2342	1678306.6363
536	669082.4390	1678801.3130	4046.63	OTC-531B-SEPTANK	668888.5248	1678314.7610
537	669072.3810	1678802.9790	4046.81	OTC-531B-SEPTANK	668878.4697	1678316.4265
538	669070.8860	1678795.3530	4046.82	OTC-531B-SEPTANK	668876.9751	1678308.8027
539	669104.1410	1678787.7690	4045.69	OTC-531B-STATION-1	668910.2205	1678301.2209
540	669070.9690	1678801.9800	4046.52	OTC-531B-STATION-2	668877.0581	1678315.4278
541	669061.4820	1678787.2510	4046.24	OTC-531B-STATION-3	668867.5739	1678300.7031
542	669022.2810	1678760.4940	4045.98	OTC-531B-MW-1-PVC	668828.3842	1678273.9538
543	669022.4740	1678760.4670	4046.35	OTC-531B-MW-1-CASING	668828.5772	1678273.9268
544	669029.7060	1678750.8610	4046.12	OTC-531B-LEACH	668835.8071	1678264.3236
545	669044.0770	1678753.3070	4046.04	OTC-531B-LEACH	668850.1739	1678266.7689
546	669048.2090	1678762.3910	4046.19	OTC-531B-LEACH	668854.3047	1678275.8503
547	669052.8600	1678773.5200	4046.17	OTC-531B-LEACH	668858.9544	1678286.9760
548	669051.8580	1678782.0380	4046.19	OTC-531B-LEACH	668857.9527	1678295.4916
549	669045.9680	1678791.0410	4045.97	OTC-531B-LEACH	668852.0644	1678304.4920
550	669037.6080	1678787.3270	4046.05	OTC-531B-LEACH	668843.7068	1678300.7790
551	669030.8940	1678787.9690	4046.07	OTC-531B-LEACH	668836.9947	1678301.4208
552	669024.6850	1678794.4050	4045.99	OTC-531B-LEACH	668830.7875	1678307.8550
553	669012.0060	1678808.0140	4045.98	OTC-531B-LEACH	668818.1122	1678321.4600
554	669005.0390	1678788.3970	4045.95	OTC-531B-LEACH	668811.1472	1678301.8487
555	669008.1540	1678771.5710	4046.05	OTC-531B-LEACH	668814.2613	1678285.0276
556	669012.3090	1678761.0960	4046.10	OTC-531B-LEACH	668818.4151	1678274.5556
557	669052.5660	1678784.6580	4046.08	OTC-531B-FLINE	668858.6605	1678298.1108
558	669071.4380	1678798.9230	4046.55	OTC-531B-FLINE	668877.5270	1678312.3717
559	669082.2160	1678797.7200	4046.58	OTC-531B-ELINE	668888.3019	1678311.1690
560	669109.7160	1678792.3340	4045.64	OTC-531B-ELINE	668915.7939	1678305.7846
561	669130.6340	1678787.5660	4047.05	OTC-531B-ELINE	668936.7058	1678301.0180
562	669132.6960	1678800.0880	4046.87	OTC-531B-BLDGCOR	668938.7672	1678313.5363
563	669139.6540	1678804.9540	4046.97	OTC-531B-BLDGCOR	668945.7232	1678318.4009
564	669127.3740	1678771.5760	4046.72	OTC-531B-BLDGCOR	668933.4468	1678285.0326
565	669131.8520	1678764.6150	4047.25	OTC-531B-BLDGCOR	668937.9235	1678278.0736
566	668593.1300	1678901.9680	4046.19	OTC-531C-BLDGCOR	668399.3576	1678415.3868
567	668588.1250	1678902.8360	4046.21	OTC-531C-BLDGCOR	668394.3541	1678416.2546
568	668585.3350	1678865.5840	4046.55	OTC-531C-BLDGCOR	668391.5649	1678379.0133
569	668590.1110	1678858.6070	4046.53	OTC-531C-BLDGCOR	668396.3395	1678372.0384
570	668590.3090	1678889.4560	4045.95	OTC-531C-ELINE	668396.5374	1678402.8784
571	668578.4210	1678891.4650	4046.03	OTC-531C-ELINE	668384.6529	1678404.8868
572	668560.7680	1678894.7530	4045.47	OTC-531C-ELINE	668367.0050	1678408.1739
573	668535.6480	1678899.2930	4046.35	OTC-531C-ELINE	668341.8923	1678412.7126
574	668535.0660	1678896.4960	4046.68	OTC-531C-SEPTIC	668341.3104	1678409.9164
575	668535.3940	1678905.9700	4046.47	OTC-531C-SEPTIC	668341.6383	1678419.3876
576	668522.2510	1678906.9450	4046.51	OTC-531C-SEPTIC	668328.4992	1678420.3624
577	668522.3100	1678897.4040	4046.39	OTC-531C-SEPTIC	668328.5581	1678410.8241

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
578	668561.9930	1678890.5660	4045.66	OTC-531C-STATION-1	668368.2296	1678403.9881
579	668531.2500	1678902.0810	4046.55	OTC-531C-STATION-2	668337.4955	1678415.4998
580	668522.9580	1678893.5110	4045.84	OTC-531C-STATION-3	668329.2059	1678406.9323
581	668521.6100	1678902.7660	4046.16	OTC-531C-FLINE	668327.8583	1678416.1846
582	668515.2610	1678901.5740	4045.66	OTC-531C-FLINE	668321.5112	1678414.9929
583	668515.8520	1678907.4010	4045.67	OTC-531C-LEACH	668322.1020	1678420.8182
584	668498.6960	1678906.8280	4045.81	OTC-531C-LEACH	668304.9510	1678420.2454
585	668489.9270	1678907.6430	4045.74	OTC-531C-LEACH	668296.1845	1678421.0602
586	668481.5760	1678902.8790	4045.69	OTC-531C-LEACH	668287.8359	1678416.2975
587	668476.1180	1678891.3230	4045.84	OTC-531C-LEACH	668282.3795	1678404.7449
588	668473.4290	1678883.0340	4045.68	OTC-531C-LEACH	668279.6913	1678396.4583
589	668473.7340	1678874.2510	4045.53	OTC-531C-LEACH	668279.9962	1678387.6778
590	668476.2360	1678867.2340	4045.54	OTC-531C-LEACH	668282.4975	1678380.6629
591	668482.1720	1678868.3950	4045.45	OTC-531C-MW-1-PVC	668288.4318	1678381.8235
592	668482.4510	1678868.3680	4045.85	OTC-531C-MW-1-CASING	668288.7107	1678381.7965
593	668490.9400	1678863.0190	4045.60	OTC-531C-LEACH	668297.1972	1678376.4491
594	668503.3450	1678866.8310	4045.87	OTC-531C-LEACH	668309.5986	1678380.2600
595	668508.4050	1678874.1920	4045.93	OTC-531C-LEACH	668314.6572	1678387.6189
596	668515.8970	1678879.7420	4045.82	OTC-531C-LEACH	668322.1470	1678393.1672
597	668524.3970	1678890.3500	4045.70	OTC-531C-LEACH	668330.6445	1678403.7722
598	667495.6300	1679128.7300	4042.53	OTC-532-BLDGCOR	667302.1757	1678642.0831
599	667488.6400	1679123.9580	4042.71	OTC-532-BLDGCOR	667295.1877	1678637.3125
600	667462.6660	1679059.4970	4041.10	OTC-532-BLDGCOR	667269.2212	1678572.8701
601	667481.1840	1679050.1710	4042.61	OTC-532-BLDGCOR	667287.7339	1678563.5469
602	667486.0130	1679106.7520	4042.73	OTC-532-ELINE	667292.5615	1678620.1115
603	667462.4800	1679111.5030	4040.38	OTC-532-ELINE	667269.0353	1678624.8611
604	667462.2250	1679114.4150	4040.62	OTC-532-STATION-1	667268.7804	1678627.7722
605	667442.0090	1679119.1410	4041.24	OTC-532-STATION-2	667248.5702	1678632.4969
606	667419.1640	1679115.1840	4040.86	OTC-532-STATION-3	667225.7319	1678628.5410
607	667385.6930	1679101.6040	4040.50	OTC-532-STATION-4	667192.2706	1678614.9649
608	667381.8850	1679101.5680	4040.62	OTC-532-LEACH	667188.4637	1678614.9290
609	667383.6400	1679091.6130	4040.63	OTC-532-LEACH	667190.2181	1678604.9768
610	667385.4250	1679087.0370	4040.57	OTC-532-LEACH	667192.0026	1678600.4022
611	667388.9960	1679084.4040	4040.65	OTC-532-LEACH	667195.5726	1678597.7699
612	667394.2390	1679084.6140	4040.73	OTC-532-LEACH	667200.8141	1678597.9799
613	667396.1210	1679092.7430	4040.70	OTC-532-LEACH	667202.6955	1678606.1065
614	667398.1240	1679100.9150	4040.70	OTC-532-LEACH	667204.6979	1678614.2761
615	667402.2360	1679106.9240	4040.75	OTC-532-LEACH	667208.8088	1678620.2834
616	667410.1270	1679109.8530	4040.82	OTC-532-LEACH	667216.6975	1678623.2116
617	667419.4540	1679110.1630	4040.85	OTC-532-LEACH	667226.0218	1678623.5215
618	667420.7270	1679120.1400	4041.02	OTC-532-FLINE	667227.2944	1678633.4956
619	667423.8510	1679141.7780	4040.59	OTC-532-LEACH	667230.4175	1678655.1273
620	667412.2990	1679143.4760	4040.74	OTC-532-LEACH	667218.8688	1678656.8248
621	667403.7350	1679143.1670	4040.80	OTC-532-LEACH	667210.3073	1678656.5159
622	667397.0900	1679139.6510	4040.75	OTC-532-LEACH	667203.6642	1678653.0009
623	667384.3300	1679127.9250	4040.44	OTC-532-LEACH	667190.9079	1678641.2783
624	667382.6070	1679116.1130	4040.44	OTC-532-LEACH	667189.1854	1678629.4697
625	667430.4810	1679118.6630	4041.32	OTC-532-FLINE	667237.0456	1678632.0190
626	667430.2210	1679114.2980	4041.25	OTC-532-SEPTIC	667236.7856	1678627.6553
627	667440.5880	1679113.0200	4041.26	OTC-532-SEPTIC	667247.1496	1678626.3776
628	667442.9470	1679123.3120	4041.21	OTC-532-SEPTIC	667249.5080	1678636.6667
629	667430.1210	1679125.8580	4041.28	OTC-532-SEPTIC	667236.6857	1678639.2119
630	667441.8110	1679116.2010	4041.27	OTC-532-ELINE	667248.3723	1678629.5577
631	669659.5140	1678688.1920	4048.05	OTC-531A-ELINE	669465.4326	1678201.6728
632	669645.1200	1678691.4170	4047.42	OTC-531A-ELINE	669451.0427	1678204.8968
633	669626.5240	1678694.6570	4048.54	OTC-531A-ELINE	669432.4521	1678208.1359
634	669625.4550	1678690.5680	4048.58	OTC-531A-SEPTIC	669431.3834	1678204.0481
635	669627.0130	1678697.2200	4048.59	OTC-531A-SEPTIC	669432.9410	1678210.6981
636	669614.1180	1678700.1730	4048.60	OTC-531A-SEPTIC	669420.0497	1678213.6503
637	669613.0940	1678693.8150	4048.72	OTC-531A-SEPTIC	669419.0260	1678207.2941
638	669648.5430	1678685.0250	4047.24	OTC-531A-STATION-1	669454.4647	1678198.5067
639	669615.3510	1678691.9600	4048.59	OTC-531A-STATION-2	669421.2823	1678205.4397
640	669607.0140	1678691.1700	4048.42	OTC-531A-STATION-3	669412.9478	1678204.6499
641	669606.7200	1678688.2040	4048.56	OTC-531A-LEACH	669412.6539	1678201.6848
642	669608.9270	1678706.1330	4048.28	OTC-531A-LEACH	669414.8602	1678219.6086
643	669601.3790	1678707.8980	4048.13	OTC-531A-LEACH	669407.3144	1678221.3730
644	669593.2420	1678708.2220	4047.49	OTC-531A-LEACH	669399.1798	1678221.6970
645	669578.1380	1678708.5010	4047.22	OTC-531A-LEACH	669384.0801	1678221.9759
646	669565.0490	1678706.1840	4047.29	OTC-531A-LEACH	669370.9949	1678219.6595
647	669554.2260	1678694.3690	4047.37	OTC-531A-LEACH	669360.1751	1678207.8480
648	669553.4160	1678687.6760	4047.59	OTC-531A-LEACH	669359.3653	1678201.1569

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
649	669552.5940	1678678.4030	4047.76	OTC-531A-LEACH	669358.5435	1678191.8866
650	669550.0120	1678656.4050	4047.76	OTC-531A-LEACH	669355.9623	1678169.8950
651	669556.1880	1678652.3190	4047.86	OTC-531A-LEACH	669362.1365	1678165.8102
652	669559.2580	1678655.8340	4047.38	OTC-531A-MW-1-PVC	669365.2056	1678169.3241
653	669559.5100	1678655.7600	4047.78	OTC-531A-MW-1-CASING	669365.4575	1678169.2502
654	669561.9190	1678650.8880	4047.69	OTC-531A-LEACH	669367.8658	1678164.3796
655	669569.0970	1678659.8040	4048.02	OTC-531A-LEACH	669375.0418	1678173.2930
656	669574.5390	1678669.0420	4047.77	OTC-531A-LEACH	669380.4822	1678182.5283
657	669580.0480	1678677.6210	4047.77	OTC-531A-LEACH	669385.9896	1678191.1048
658	669581.1180	1678685.2190	4047.72	OTC-531A-LEACH	669387.0593	1678198.7006
659	669589.3790	1678690.0080	4047.91	OTC-531A-LEACH	669395.3179	1678203.4882
660	669598.7410	1678687.4540	4047.88	OTC-531A-LEACH	669404.6772	1678200.9350
661	669608.6000	1678697.8630	4048.38	OTC-531A-FLINE	669414.5333	1678211.3410
662	669613.4950	1678697.0050	4048.61	OTC-531A-FLINE	669419.4269	1678210.4832
663	669434.7190	1685385.1220	4055.15	US/TC-515-EXAVATION	669240.7027	1684896.6618
664	669433.7320	1685375.0770	4054.68	US/TC-515-EXAVATION	669239.7160	1684886.6198
665	669453.6100	1685372.2880	4054.89	US/TC-515-EXAVATION	669259.5882	1684883.8316
666	669455.2490	1685382.6100	4055.08	US/TC-515-EXAVATION	669261.2268	1684894.1506
667	669423.1290	1685379.3360	4054.73	US/TC-515-POTHOLE-1	669229.1161	1684890.8775
668	669443.7270	1685362.1260	4054.20	US/TC-515-POTHOLE-2	669249.7081	1684873.6725
669	669443.2340	1685352.4030	4053.69	US/TC-515-POTHOLE-3	669249.2152	1684863.9523
670	669388.8600	1685382.9350	4054.36	US/TC-515-POTHOLE-4	669194.8570	1684894.4755
671	666075.3380	1693454.3920	4059.75	US/TC-502-TANK/EX	665882.2953	1692963.5932
672	666064.5480	1693454.6090	4059.59	US/TC-502-TANK/EX	665871.5084	1692963.8101
673	666064.5890	1693463.2320	4059.66	US/TC-502-TANK/EX	665871.5494	1692972.4306
674	666075.7420	1693463.6580	4059.85	US/TC-502-TANK/EX	665882.6992	1692972.8565
675	666070.2430	1693458.8620	4059.56	US/TC-502-STATION-1	665877.2018	1692968.0619
676	666075.3470	1693459.1030	4059.61	US/TC-502-STATION-2	665882.3043	1692968.3028
677	666070.4890	1693455.0470	4059.46	US/TC-502-STATION-3	665877.4477	1692964.2480
678	666070.2650	1693463.1340	4059.49	US/TC-502-STATION-4	665877.2238	1692972.3327
679	666072.2440	1693503.2780	4060.12	US/TC-502-FIREHY	665879.2022	1693012.4650
680	669813.9600	1693315.1950	4077.70	US/TC-503-EXAVATION	669619.8338	1692824.4365
681	669826.0790	1693326.7460	4077.45	US/TC-503-EXAVATION	669631.9493	1692835.9842
682	669815.4720	1693337.1950	4077.67	US/TC-503-EXAVATION	669621.3454	1692846.4302
683	669803.8000	1693324.4750	4077.59	US/TC-503-EXAVATION	669609.6767	1692833.7139
684	669818.2990	1693319.1730	4077.48	US/TC-503-BEGTRENCH	669624.1715	1692828.4134
685	669837.0790	1693303.2490	4076.88	US/TC-503-ENDTRENCH	669642.9461	1692812.4940
686	681138.0180	1690539.4590	4109.33	OTC-538-STATION-5	680940.6098	1690049.5050
687	673758.3950	1683356.5480	4060.55	US/TC-514-STATION-1	673563.1256	1682868.6758
688	673765.5540	1683358.1250	4060.47	US/TC-514-STATION-2	673570.2825	1682870.2523
689	673770.0890	1683350.4240	4060.48	US/TC-514-STATION-3	673574.8162	1682862.5535
690	673768.2490	1683354.2670	4060.48	US/TC-514-STATION-4	673572.9768	1682866.3954
691	673777.4280	1683353.4050	4060.71	US/TC-514-STATION-5	673582.1531	1682865.5337
692	673776.8350	1683359.0390	4060.94	US/TC-514-BLDGCOR	673581.5603	1682871.1661
693	673769.7480	1683353.9100	4060.70	US/TC-514-BLDGCOR	673574.4753	1682866.0385
694	673778.8570	1683370.4750	4060.92	US/TC-514-BLDGCOR	673583.5817	1682882.5987
695	673773.9440	1683377.3380	4060.70	US/TC-514-BLDGCOR	673578.6701	1682889.4597
696	673723.3370	1683411.0030	4060.56	US/TC-514-MW-1-PVC	673528.0778	1682923.1150
697	673723.6160	1683410.9000	4061.02	US/TC-514-MW-1-CASIN	673528.3567	1682923.0120
698	673699.2890	1683380.7720	4061.09	US/TC-514-MW-2-CASIN	673504.0367	1682892.8928
699	673698.9660	1683380.8260	4060.66	US/TC-514-MW-2-PVC	673503.7138	1682892.9467
700	673812.5550	1683317.4880	4060.43	US/TC-514-MW-3-PVC	673617.2699	1682829.6271
701	673812.8820	1683317.4350	4060.76	US/TC-514-MW-3-CASIN	673617.5968	1682829.5741
702	673776.7270	1683350.1350	4060.82	US/TC-514-FORM/TANK	673581.4523	1682862.2646
703	673777.3420	1683356.4370	4060.94	US/TC-514-FORM/TANK	673582.0671	1682868.5648
704	673759.1130	1683359.4810	4061.06	US/TC-514-FORM/TANK	673563.8434	1682871.6079
705	673757.7990	1683353.3170	4061.32	US/TC-514-FORM/TANK	673562.5298	1682865.4457
706	678061.9490	1684350.2580	4078.63	US/TC-516-FORMTANK	677865.4323	1683862.0978
707	678072.0100	1684348.4740	4078.61	US/TC-516-FORMTANK	677875.4904	1683860.3143
708	678074.0860	1684360.1530	4078.25	US/TC-516-FORMTANK	677877.5658	1683871.9899
709	678065.1290	1684362.4260	4078.47	US/TC-516-FORMTANK	677868.6114	1683874.2622
710	678069.6040	1684359.8850	4078.30	US/TC-516-STATION-1	677873.0851	1683871.7220
711	678064.5960	1684356.9350	4078.34	US/TC-516-STATION-2	677868.0786	1683868.7728
712	678066.1670	1684350.4200	4078.54	US/TC-516-STATION-3	677869.6491	1683862.2597
713	678072.9250	1684354.8490	4078.09	US/TC-516-STATION-4	677876.4052	1683866.6874
714	678101.7280	1684311.2380	4077.72	US/TC-516-MW-2	677905.1998	1683823.0891
715	678116.9250	1684291.3650	4077.78	US/TC-516-MW-2	677920.3924	1683803.2218
716	678061.7680	1684335.2520	4080.38	US/TC-516-BLDGCOR	677865.2514	1683847.0961
717	678064.6310	1684348.2080	4081.07	US/TC-516-BLDGCOR	677868.1136	1683860.0484
718	678026.7560	1684390.7900	4078.49	US/TC-516-MW-1	677830.2495	1683902.6180
719	678014.0050	1684363.8290	4077.81	US/TC-516-MW-3	677817.5022	1683875.6648

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
720	671269.9880	1692357.3370	4075.08	US/TC-508-FORM/TANK	671075.4398	1691866.8562
721	671299.4450	1692330.8640	4075.18	US/TC-508-FORM/TANK	671104.8883	1691840.3908
722	671324.3300	1692358.5130	4075.17	US/TC-508-FORM/TANK	671129.7661	1691868.0318
723	671294.8560	1692384.8580	4075.02	US/TC-508-FORM/TANK	671100.3006	1691894.3692
724	671311.5950	1692346.0080	4075.12	US/TC-508-STATION-2	671117.0347	1691855.5304
725	671302.2680	1692357.1830	4075.07	US/TC-508-STATION-1	671107.7104	1691866.7022
726	671312.4640	1692368.2800	4074.98	US/TC-508-STATION-4	671117.9035	1691877.7960
727	671282.5110	1692369.9060	4075.01	US/TC-508-STATION-3	671087.9592	1691879.4215
728	671289.2400	1692342.4620	4075.15	US/TC-508-STATION-5	671094.6862	1691851.9855
729	671373.3210	1692386.6060	4075.00	US/TC-508-MW-3-PVC	671178.7429	1691896.1167
730	671373.6120	1692386.5000	4075.33	US/TC-508-MW-3-CASIN	671179.0338	1691896.0107
731	671216.9160	1692488.1670	4075.54	US/TC-508-SS18-MW08-CASIN	671022.3832	1691997.6482
732	671216.7110	1692488.4340	4075.26	US/TC-508-SS18-MW08-PVC	671022.1782	1691997.9152
733	671236.3110	1692301.9320	4075.19	US/TC-508-MW-2-CASIN	671041.7726	1691811.4672
734	671236.1240	1692302.1450	4074.80	US/TC-508-MW-2-PVC	671041.5856	1691811.6801
735	671211.3090	1692324.4610	4075.35	US/TC-508-MW-1-CASIN	671016.7778	1691833.9897
736	671211.0360	1692324.6620	4074.93	US/TC-508-MW-1-PVC	671016.5049	1691834.1906
737	671174.1880	1692241.9700	4074.81	US/TC-508-SS18-MW16-PVC	670979.6676	1691751.5226
738	671174.4770	1692241.7880	4075.34	US/TC-508-SS18-MW16-CASIN	670979.9565	1691751.3406
739	671035.8870	1692106.1030	4074.42	US/TC-508-SS18-MW18-CASIN	670841.4066	1691615.6950
740	671035.6230	1692106.3690	4073.74	US/TC-508-SS18-MW18-PVC	670841.1427	1691615.9609
741	671043.1730	1692355.2630	4075.73	US/TC-508-SS18-MW19-PVC	670848.6905	1691864.7828
742	670383.2120	1691278.5670	4072.57	US/TC-504-MW-2-CASIN	670188.9208	1690788.3988
743	670383.0220	1691278.7790	4072.19	US/TC-504-MW-2-PVC	670188.7309	1690788.6107
744	670343.7050	1691297.2270	4072.57	US/TC-504-MW-1-PVC	670149.4253	1690807.0534
745	670343.9460	1691296.8630	4072.80	US/TC-504-MW-1-CASIN	670149.6662	1690806.6895
746	669680.3630	1678704.0610	4048.54	OTC-531A-BLDGCOR	669486.2755	1678217.5372
747	669673.4280	1678699.1340	4048.44	OTC-531A-BLDGCOR	669479.3425	1678212.6116
748	669662.1160	1678671.3190	4048.32	OTC-531A-BLDGCOR	669468.0338	1678184.8047
749	669671.0810	1678657.6480	4048.29	OTC-531A-BLDGCOR	669476.9962	1678171.1376
750	669671.6690	1678686.6260	4048.54	OTC-531A-ELINE	669477.5840	1678200.1072
751	670995.2900	1691723.6540	4072.55	US/TC-500-STATION-6	670800.8214	1691233.3568
752	682707.7150	1693994.3080	4139.12	OTC-539-SEPTIC	682509.8519	1693503.3527
753	682707.1360	1693987.5070	4139.01	OTC-539-SEPTIC	682509.2731	1693496.5537
754	682713.9270	1693987.3840	4139.07	OTC-539-SEPTIC	682516.0621	1693496.4307
755	682714.4020	1693993.8490	4139.12	OTC-539-SEPTIC	682516.5370	1693502.8939
756	682710.5050	1693994.2530	4139.11	OTC-539-ELINE	682512.6411	1693503.2977
757	682711.7750	1694038.3560	4139.83	OTC-539-ELINE	682513.9107	1693547.3880
758	682709.6340	1694009.1330	4139.38	OTC-539-STATION-1	682511.7704	1693518.1734
759	682715.9010	1693990.7160	4139.12	OTC-539-STATION-2	682518.0355	1693499.7618
760	682707.9950	1693985.7400	4139.05	OTC-539-STATION-3	682510.1318	1693494.7872
761	682690.1540	1693966.7430	4138.58	OTC-539-STATION-4	682492.2960	1693475.7957
762	682700.5510	1693984.6270	4139.10	OTC-539-LEACH	682502.6900	1693493.6745
763	682694.7220	1693978.9800	4138.75	OTC-539-LEACH	682496.8627	1693488.0292
764	682685.8570	1693975.5370	4138.62	OTC-539-LEACH	682488.0002	1693484.5872
765	682686.8260	1693963.6500	4138.56	OTC-539-LEACH	682488.9690	1693472.7036
766	682690.9260	1693959.9730	4138.78	OTC-539-LEACH	682493.0678	1693469.0277
767	682696.9840	1693956.9410	4138.94	OTC-539-LEACH	682499.1240	1693465.9966
768	682705.4410	1693958.5980	4139.12	OTC-539-LEACH	682507.5786	1693467.6531
769	682714.7430	1693968.3290	4139.32	OTC-539-LEACH	682516.8779	1693477.3813
770	682721.4010	1693976.8710	4139.30	OTC-539-LEACH	682523.5339	1693485.9208
771	682717.7930	1693983.8070	4139.35	OTC-539-LEACH	682519.9270	1693492.8548
772	682710.1830	1693984.5790	4139.16	OTC-539-FLINE	682512.3192	1693493.6265
773	682710.2190	1693987.2160	4139.18	OTC-539-FLINE	682512.3552	1693496.2628
774	682690.6020	1694039.4720	4139.43	OTC-539-BLDGCOR	682492.7439	1693548.5036
775	682684.8200	1694045.5030	4139.27	OTC-539-BLDGCOR	682486.9635	1693554.5329
776	682741.4000	1694039.0240	4140.22	OTC-539-BLDGCOR	682543.5271	1693548.0558
777	682747.1830	1694045.0970	4140.68	OTC-539-BLDGCOR	682549.3085	1693554.1270

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7824
PROFESSIONAL SURVEYOR

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
778	686068.4560	1686694.7280	4103.68	OTC-534-MW-10-PVC	685869.6189	1686205.8883
779	686068.7800	1686694.7810	4104.06	OTC-534-MW-10-CASING	685869.9428	1686205.9413
780	685846.6180	1686522.2590	4102.52	OTC-534-MW-11-CASING	685647.8452	1686033.4693
781	685846.3620	1686522.2240	4102.15	OTC-534-MW-11-PVC	685647.5893	1686033.4343
782	685670.3280	1686561.9490	4102.29	OTC-534-MW-12-PVC	685471.6063	1686073.1478
783	685670.6410	1686561.9860	4102.69	OTC-534-MW-12-CASING	685471.9192	1686073.1848

RAW DATA

HOLLOMAN AIR FORCE BASE
WEST SITE

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	684793.2210	1611172.5300	3911.93	BASE	684598.9178	1610715.3759
2	682531.9480	1628747.6200	3965.57	EC-30	682338.2864	1628285.4792
3	682452.1330	1628714.0920	3957.20	EC-30-2	682258.4940	1628251.9607
4	698323.2620	1606321.3780	3915.08	CHAS	698125.1198	1605865.6004
5	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
60	616427.1730	1576921.6540	3941.67	LUCERO	616252.2680	1576474.2182
61	600657.7750	1576446.9260	4131.58	GERI	600487.3444	1575999.6249
62	614156.5210	1568701.1170	4227.09	SW 30	613982.2602	1568256.0137
63	575518.1130	1586543.7100	4038.20	BRYCE AZ MK	575354.8155	1586093.5441
64	576512.9440	1582067.6800	4357.70	BRYCE	576349.3642	1581618.7841
65	633185.2600	1566510.7280	4417.64	HORN	633005.6000	1566066.2462
66	580320.9040	1585783.2080	4128.59	NICK 2	580156.2437	1585333.2579
67	682452.1790	1628714.1810	3957.10	EC-30-2	682258.5400	1628252.0496
68	698323.2620	1606321.3780	3914.70	CHAS	698125.1198	1605865.6004
69	698212.0050	1609477.2870	3928.40	CHUCK	698013.8943	1609020.6139
70	682531.9020	1628747.5310	3965.57	EC-30	682338.2404	1628285.3902
71	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
100	684194.1900	1611160.8710	3912.56	USTC-518-NG	684000.0567	1610703.7202
101	684194.8810	1611165.7430	3912.33	USTC-518-NG	684000.7475	1610708.5908
102	684188.7970	1611168.5190	3912.27	USTC-518-NG	683994.6653	1610711.3660
103	684189.4230	1611176.5450	3912.53	USTC-518-NG	683995.2911	1610719.3898
104	684179.6480	1611178.5150	3912.57	USTC-518-NG	683985.5189	1610721.3592
105	684178.1630	1611171.1680	3912.37	USTC-518-NG	683984.0343	1610714.0143
106	684177.1790	1611163.0630	3913.00	USTC-518-NG	683983.0506	1610705.9116
107	684157.6940	1611173.6700	3912.42	USTC-518-STATION-5	683963.5711	1610716.5156
108	684176.2170	1611179.5100	3912.28	USTC-518-STATION-4	683982.0888	1610722.3539
109	684175.8730	1611172.3430	3912.51	USTC-518-STATION-2	683981.7449	1610715.1890
110	684173.8830	1611163.3430	3912.65	USTC-518-STATION-3	683979.7555	1610706.1915
111	684189.5770	1611170.0220	3912.30	USTC-518-STATION-1	683995.4450	1610712.8686
112	684160.3220	1611172.8640	3912.49	USTC-518-POTHOLE-1	683966.1984	1610715.7098
113	684125.1520	1611185.2360	3910.93	USTC-518-MW-1	683931.0383	1610728.0783
114	684130.9190	1611216.0540	3911.17	USTC-518-MW-2	683936.8037	1610758.8876
115	684158.8770	1611187.1610	3912.34	USTC-518-BLDGCORN-70	683964.7538	1610730.0028
116	684163.9700	1611180.4420	3912.46	USTC-518-BLDGCORN-70	683969.8453	1610723.2857
117	684211.6690	1611174.1790	3912.47	USTC-518-BLDGCORN-70	684017.5308	1610717.0244
118	684218.3800	1611179.3060	3912.45	USTC-518-BLDGCORN-70	684024.2399	1610722.1500
119	684236.0190	1611144.8000	3911.88	USTC-518-NAIL	684041.8739	1610687.6538
120	684242.7800	1611133.9130	3911.77	USTC-518-NAIL	684048.6330	1610676.7699
121	684203.7200	1611162.6570	3912.21	USTC-518-STATION-6	684009.5840	1610705.5057

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7924
PROFESSIONAL SURVEYOR

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-068

Appendix H
Laboratory Analytical Data and Data Validation Checklists

Note: The data validation checklists and laboratory analytical data reports are provided as separate files.

Appendix I
Waste Manifests

HAFB-001

Generator's Name	Generator's Address	Generator's Telephone No.
USAF	550 TABOSA AVE Holloman AFB NM 88330	575-491-8262

Origin of Special Waste (Project or Spill Location): ~~White Sands National Monument Park - Storage Lagoons~~ Holloman AFB NM Bldg # 55

Transporter #1 Company Name	Address	Telephone No.
Southwest Disposal	1350 LaVelle Road	575-434-1109
Transporter #2 Company Name	Address	Telephone No.
	Alamogordo, NM 88310	

Destination Facility Name/Site Address	Facility ID (Permit) Number	Telephone No.
Otero/Greentree Regional Landfill 24 Mls South of Alamogordo, Hwy 54	SWM-109102	575-439-4355

Type and Proper Name of Special Waste	Container(s) No.	Container(s) Type	Total Quantity	Unit Wt/Vol	
Non RCRA/Non Hazardous Substance ~~(Treatment Plant Lagoon Sludge)~~ (soil)		SD		6.95	Tons

Additional Descriptions for Special Waste Listed Above:

Site Contact: Todd Hiltunen 307-214-6080

Special Handling Instructions:

Southwest Disposal - Lined and Covered Roll-off

GENERATOR'S CERTIFICATION I hereby certify that the contents of this shipment are fully and accurately described above by type and proper name of the special waste, and that such waste has been managed, packaged, containerized and labeled in accordance with the requirements of 20.9.8 NMAC (Special Waste Requirements) in addition to any other applicable federal, state or local regulations.

Truck # 553 Bin #

Printed/Typed Name:	Signature:	Date:
Todd Hiltunen for Brent Hunt (CES)	for Brent Hunt (CES)	9/25/12

Transporter 1 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:
David Gurnbach		9/26/12

Transporter 2 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:

Discrepancy Indication Space:

Analytical supplied to landfill

no facility ID number

Facility Owner or Operator: ***I hereby acknowledge receipt of the special waste as indicated upon this manifest, except as noted above in the Discrepancy Indication Space.***

Printed/Typed Name:	Signature:	Date:
Darrell McGinnis / Attendant		9-26-12

~~Facility~~

OTERO/GREENTREE
REGIONAL LANDFILL

TRANSACTION: 28,080

CO. NAME:

ADDRESS: Environmental Waste Solutions
1348 B. Redtail Hawk Drive

CITY & STATE: Boardman, OH 44512

DATE: 9/26/12 TIME: 9:07 am

TRUCK NO.: 198

GROSS WEIGHT 47000

TARE WEIGHT: 33100

NET TONS: 13900 6.95

COST $: [redacted]

5% TAX $:

TOTAL DUE $:

WASTE: 5

WASTE DESC.: Construction Debris
H.A.F.B.

WASTE ORIGIN:

DRIVER

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-068

Appendix J
Risk Evaluation Calculations

Table J-1
Antimony

Site-specific
Resident Equation Inputs for Tap Water

Variable	Value
TR (target cancer risk) unitless	0.00001
ED_r (exposure duration - resident) year	30
ED_c (exposure duration - child) year	6
ED_a (exposure duration - adult) year	24
ED_{0-2} (mutagenic exposure duration first phase) year	2
ED_{2-6} (mutagenic exposure duration second phase) year	4
ED_{6-16} (mutagenic exposure duration third phase) year	10
ED_{16-30} (mutagenic exposure duration fourth phase) year	14
THQ (target hazard quotient) unitless	1
LT (lifetime - resident) year	70
EF_r (exposure frequency) day/year	350
EF_{0-2} (mutagenic exposure frequency first phase) day/year	
EF_{2-6} (mutagenic exposure frequency second phase) day/year	
EF_{6-16} (mutagenic exposure frequency third phase) day/year	
EF_{16-30} (mutagenic exposure frequency fourth phase) day/year	
ET_{rw-adj} (age-adjusted exposure time) hour/day	0.664
$ET_{rw-madj}$ (mutagenic age-adjusted exposure time) hour/day	0.664
ET_{rwa} (adult tapwater exposure time) hour/day	0.58
ET_{rwc} (child tapwater exposure time) hour/day	1
ET_r (exposure time - resident) hour/day	24
ET_{0-2} (mutagenic exposure time first phase) hour/event	1
ET_{2-6} (mutagenic exposure time second phase) hour/event	1
ET_{6-16} (mutagenic exposure time third phase) hour/event	0.58
ET_{16-30} (mutagenic exposure time fourth phase) hour/event	0.58
BW_a (body weight - adult) kg	70
BW_c (body weight - child) kg	15
IRW_a (water intake rate - adult) L/day	2
IRW_c (water intake rate - child) L/day	1
EV_{rwa} (adult events) per day	1
EV_{rwc} (child events) per day	1
EV_{0-2} (mutagenic events first phase) per day	1
EV_{2-6} (mutagenic events first phase) per day	1
EV_{6-16} (mutagenic events first phase) per day	1
EV_{16-30} (mutagenic events first phase) per day	1
K (volatilization factor of Andelman) L/m^3	0.5
IFW_{adj} (adjusted intake factor) L-year/kg-day	1.086
$IFWM_{adj}$ (mutagenic adjusted intake factor) L-year/kg-day	3.39
DFW_{adj} (age-adjusted dermal factor) cm^2-event/kg	8811.4
$DFWM_{adj}$ (mutagenic age-adjusted dermal factor) cm^2-event/kg	25394.29
SA_a (skin surface area - adult) cm^2	18000
SA_c (skin surface area - child) cm^2	6600
IRW_{0-2} (mutagenic water intake rate) L/hr	1
IRW_{2-6} (mutagenic water intake rate) L/hr	1
IRW_{6-16} (mutagenic water intake rate) L/hr	2
IRW_{16-30} (mutagenic water intake rate) L/hr	2
l_{sc} (apparent thickness of stratum corneum) cm	0.001

Output generated 03DEC2012:13:18:22

Table J-1
Antimony

Site-specific

Resident Risk-Based Screening Levels (RSL) for Tap Water

ca=Cancer, nc=Noncancer, ca* (Where nc SL < 100 x ca SL),

ca** (Where nc SL < 10 x ca SL),

max=SL exceeds ceiling limit (see User's Guide), sat=SL exceeds csat

Chemical	CAS Number	Chemical Type	Ingestion SF $(mg/kg\text{-}day)^{-1}$	SFO Ref	Inhalation Unit Risk $(ug/m^3)^{-1}$	IUR Ref	Chronic RfD (mg/kg-day)	RfD Ref	Chronic RfC (mg/m^3)	RfC Ref	voc	GIABS	kp	mw	pi
Antimony (metallic)	7440-36-0	Inorganics	-		-		4.00E-04	U	-		0	0.15	0.001	121.76	3.1415927

03DEC2012:13:18:22

Table J-1
Antimony

logds	dsclc	dsc	c	littleb	B	tstar	tau_event	fa	In EPD?	DAeventc	DAeventn
-3.481856	0.0003297	3.2972E-7	0.3361687	0.3058662	0.004244	1.2131542	0.5054809	1	Yes	-	0.0001422

Table J-1
Antimony

MCL ug/L	Ingestion SL TR=1.0E-5 (ug/L)	Dermal SL TR=1.0E-5 (ug/L)	Inhalation SL TR=1.0E-5 (ug/L)	Carcinogenic SL TR=1.0E-5 (ug/L)	Ingestion SL HQ=1 (ug/L)	Dermal SL HQ=1 (ug/L)	Inhalation SL HQ=1 (ug/L)	Noncarcinogenic SL HI=1 (ug/L)	Screening Level (ug/L)
6.00E+00	-	-	-	-	6.26E+00	1.42E+02	-	5.99E+00	5.99E+00 nc

Table J-2
Manganese

Site-specific
Resident Equation Inputs for Tap Water

Variable	Value
TR (target cancer risk) unitless	0.00001
ED_r (exposure duration - resident) year	30
ED_c (exposure duration - child) year	6
ED_a (exposure duration - adult) year	24
ED_{0-2} (mutagenic exposure duration first phase) year	2
ED_{2-6} (mutagenic exposure duration second phase) year	4
ED_{6-16} (mutagenic exposure duration third phase) year	10
ED_{16-30} (mutagenic exposure duration fourth phase) year	14
THQ (target hazard quotient) unitless	1
LT (lifetime - resident) year	70
EF_r (exposure frequency) day/year	350
EF_{0-2} (mutagenic exposure frequency first phase) day/year	350
EF_{2-6} (mutagenic exposure frequency second phase) day/year	350
EF_{6-16} (mutagenic exposure frequency third phase) day/year	350
EF_{16-30} (mutagenic exposure frequency fourth phase) day/year	350
ET_{rw-adj} (age-adjusted exposure time) hour/day	0.664
$ET_{rw-madj}$ (mutagenic age-adjusted exposure time) hour/day	0.664
ET_{rwa} (adult tapwater exposure time) hour/day	0.58
ET_{rwc} (child tapwater exposure time) hour/day	1
ET_r (exposure time - resident) hour/day	24
ET_{0-2} (mutagenic exposure time first phase) hour/event	1
ET_{2-6} (mutagenic exposure time second phase) hour/event	1
ET_{6-16} (mutagenic exposure time third phase) hour/event	0.58
ET_{16-30} (mutagenic exposure time fourth phase) hour/event	0.58
BW_a (body weight - adult) kg	70
BW_c (body weight - child) kg	15
IRW_a (water intake rate - adult) L/day	2
IRW_c (water intake rate - child) L/day	1
EV_{rwa} (adult events) per day	1
EV_{rwc} (child events) per day	1
EV_{0-2} (mutagenic events first phase) per day	1
EV_{2-6} (mutagenic events first phase) per day	1
EV_{6-16} (mutagenic events first phase) per day	1
EV_{16-30} (mutagenic events first phase) per day	1
K (volatilization factor of Andelman) L/m^3	0.5
IFW_{adj} (adjusted intake factor) L-year/kg-day	1.086
$IFWM_{adj}$ (mutagenic adjusted intake factor) L-year/kg-day	3.39
DFW_{adj} (age-adjusted dermal factor) cm^2-event/kg	8811.4
$DFWM_{adj}$ (mutagenic age-adjusted dermal factor) cm^2-event/kg	25394.29
SA_a (skin surface area - adult) cm^2	18000
SA_c (skin surface area - child) cm^2	6600
IRW_{0-2} (mutagenic water intake rate) L/hr	1
IRW_{2-6} (mutagenic water intake rate) L/hr	1
IRW_{6-16} (mutagenic water intake rate) L/hr	2
IRW_{16-30} (mutagenic water intake rate) L/hr	2
l_{sc} (apparent thickness of stratum corneum) cm	0.001

Output generated 04DEC2012:13:07:47

Table J-2
Manganese

Site-specific
Resident Risk-Based Screening Levels (RSL) for Tap Water
ca=Cancer, nc=Noncancer, ca* (Where nc SL < 100 x ca SL),
ca** (Where nc SL < 10 x ca SL),
max=SL exceeds ceiling limit (see User's Guide), sat=SL exceeds csat

Chemical	CAS Number	Chemical Type	Ingestion SF $(mg/kg\text{-}day)^{-1}$	SFO Ref	Inhalation Unit Risk $(ug/m^3)^{-1}$	IUR Ref	Chronic RfD (mg/kg-day)	RfD Ref	Chronic RfC (mg/m^3)	RfC Ref	VOC	GIABS
Manganese (Non-diet)	7439-96-5	Inorganics	-		-		2.40E-02	S	5.00E-05	I	0	0.04

Output generated 04DEC2012:13:07:47

Table J-2
Manganese

KP	MW	pi	logds	dsclc	dsc	c	littleb	B	tstar	tau_event	FA	In EPD?	DAeventc	DAeventn	MCL ug/L
0.001	54.94	3.1415927	-3.107664	0.0007804	7.8043E-7	0.3352366	0.3050181	0.0028508	0.5125355	0.2135565	1	Yes	-	0.0022753	-

Table J-2
Manganese

Ingestion SL TR=1.0E-5 (ug/L)	Dermal SL TR=1.0E-5 (ug/L)	Inhalation SL TR=1.0E-5 (ug/L)	Carcinogenic SL TR=1.0E-5 (ug/L)	Ingestion SL HQ=1 (ug/L)	Dermal SL HQ=1 (ug/L)	Inhalation SL HQ=1 (ug/L)	Noncarcinogenic SL HI=1 (ug/L)	Screening Level (ug/L)
-	-	-	-	3.75E+02	2.28E+03	-	3.22E+02	3.22E+02 nc

Risk Additivity
Soil Analytical Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC542-IS-0001-070212		OTC542-IS-0002-070212-FD		OTC542-IS-0003-070212		OTC542-IS-0004-070212		OTC542-IS-0005-070212		OTC542-IS-0006-070212		OTC542-IS-0007-070212		OTC542-IS-0008-070212		OTC542-IS-0009-070212		OTC542-IS-0010-070212		OTC542-IS-0011-070212	
				Sample Date	7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012	
				Location	Station 1, septic tank influent						Station 2, septic tank				Station 3, septic tank effluent				Station 4, septic tank leach field							
				Depth (ft bgs)	3 - 5		3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		23 - 25	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**81.4**		**84**		**71.4**		**88.7**		**86.6**		**85.5**		**86.8**		**83.9**		**86.9**		**82.5**		**84.4**	
VOLATILES (mg/kg)																										
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0011	U	0.001	U	0.0015	U	0.00098	U	0.001	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0013	U	0.00087	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0012	U	0.0011	U	0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0012	U	0.0014	U	0.00095	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0017	U	0.0016	U	0.0024	U	0.0015	U	0.0016	U	0.0017	U	0.0017	U	0.0016	U	0.0017	U	0.002	U	0.0014	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0011	U	0.001	U	0.0015	U	0.00098	U	0.001	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0013	U	0.00087	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0011	U	0.001	U	0.0015	U	0.00098	U	0.001	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0013	U	0.00087	U
1,1-DICHLOROETHENE	NE	240	449		0.0014	U	0.0013	U	0.0019	U	0.0012	U	0.0013	U	0.0014	U	0.0014	U	0.0014	U	0.0014	U	0.0016	U	0.0011	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0012	UJ	0.0011	U	0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0012	U	0.0014	U	0.00095	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0024	U	0.0021	U	0.0032	U	0.002	U	0.0022	U	0.0023	U	0.0024	U	0.0022	U	0.0023	U	0.0027	U	0.0018	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.001	U	0.00092	U	0.0014	U	0.00089	U	0.00094	U	0.001	U	0.001	U	0.00096	U	0.001	U	0.0012	U	0.0008	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0011	U	0.001	U	0.0015	U	0.00098	U	0.001	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0013	U	0.00087	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.001	U	0.00092	U	0.0014	U	0.00089	U	0.00094	U	0.001	U	0.001	U	0.00096	U	0.001	U	0.0012	U	0.0008	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0012	U	0.0011	U	0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0012	U	0.0014	U	0.00095	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0012	U	0.0011	U	0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0012	U	0.0014	U	0.00095	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0011	U	0.001	U	0.0015	U	0.00098	U	0.001	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0013	U	0.00087	U
2-HEXANONE	NE	210	NE		0.0055	U	0.005	U	0.0075	U	0.0048	U	0.0051	U	0.0055	U	0.0055	U	0.0052	U	0.0055	U	0.0063	U	0.0043	U
ACETONE	NE	61000	66600		**0.107**		**0.0822**		0.028	U	0.018	U	0.019	U	0.02	U	0.02	U	0.019	U	0.02	U	**0.135**		0.016	U
BENZENE	NE	1.1	15.4		0.0015	U	0.0014	U	0.0021	U	0.0013	U	0.0014	U	0.0015	U	0.0015	U	0.0014	U	0.0015	U	0.0017	U	0.0012	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0011	U	0.001	U	0.0015	U	0.00098	U	0.001	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0013	U	0.00087	U
BROMOFORM	NE	62	616		0.0015	U	0.0014	U	0.0021	U	0.0013	U	0.0014	U	0.0015	U	0.0015	U	0.0014	U	0.0015	U	0.0017	U	0.0012	U
BROMOMETHANE	NE	7.3	16.5		0.0021	U	0.0018	U	0.0028	U	0.0018	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.002	U	0.0023	U	0.0016	U
CARBON DISULFIDE	NE	820	1530		0.0021	U	0.0018	U	0.0028	U	0.0018	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.002	U	0.0023	U	0.0016	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0018	U	0.0017	U	0.0025	U	0.0016	U	0.0017	U	0.0018	U	0.0018	U	0.0017	U	0.0018	U	0.0021	U	0.0014	U
CHLOROBENZENE	NE	290	376		0.001	U	0.00092	U	0.0014	U	0.00089	U	0.00094	U	0.001	U	0.001	U	0.00096	U	0.001	U	0.0012	U	0.0008	U
CHLOROETHANE	NE	15000	29800		0.0021	U	0.0018	U	0.0028	U	0.0018	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.002	U	0.0023	U	0.0016	U
CHLOROFORM	NE	0.29	5.86		0.0012	U	0.0011	U	0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0012	U	0.0014	U	0.00095	U
CHLOROMETHANE	NE	120	275		0.0021	U	0.0018	U	0.0028	U	0.0018	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.002	U	0.0023	U	0.0016	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0015	U	0.0014	U	0.0021	U	0.0013	U	0.0014	U	0.0015	U	0.0015	U	0.0014	U	0.0015	U	0.0017	U	0.0012	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.001	U	0.00092	U	0.0014	U	0.00089	U	0.00094	U	0.001	U	0.001	U	0.00096	U	0.001	U	0.0012	U	0.0008	U
CYCLOHEXANE	NE	7000	NE		0.0014	U	0.0013	U	0.0019	U	0.0012	U	0.0013	U	0.0014	U	0.0014	U	0.0014	U	0.0014	U	0.0016	U	0.0011	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.001	U	0.00092	U	0.0014	U	0.00089	U	0.00094	U	0.001	U	0.001	U	0.00096	U	0.001	U	0.0012	U	0.0008	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0015	U	0.0014	U	0.0021	U	0.0013	U	0.0014	U	0.0015	U	0.0015	U	0.0014	U	0.0015	U	0.0017	U	0.0012	U
ETHYLBENZENE	NE	5.4	68.4		0.001	U	0.00092	U	0.0014	U	0.00089	U	0.00094	U	0.001	U	0.001	U	0.00096	U	0.001	U	0.0012	U	0.0008	U
ISOPROPYLBENZENE	NE	2100	2430		0.0011	U	0.001	U	0.0015	U	0.00098	U	0.001	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0013	U	0.00087	U
METHYL ACETATE	NE	78000	78200		0.013	U	0.012	U	0.017	U	0.011	U	0.012	U	0.013	U	0.013	U	0.012	U	0.013	U	0.015	U	0.0099	U
METHYL ETHYL KETONE	NE	28000	37100		0.0063	U	0.0056	U	0.0085	U	0.0054	U	0.0057	U	0.0062	U	0.0062	U	0.0059	U	0.0062	U	0.0071	U	0.0049	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0056	U	0.0051	U	0.0077	U	0.0049	U	0.0052	U	0.0056	U	0.0056	U	0.0053	U	0.0056	U	0.0064	U	0.0044	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0013	U	0.0012	U	0.0018	U	0.0012	U	0.0012	U	0.0013	U	0.0013	U	0.0013	U	0.0013	U	0.0015	U	0.001	U
METHYLENE CHLORIDE		56	409		0.0047	U	0.0043	U	0.0064	U	0.0041	U	0.0043	U	0.0047	U	0.0047	U	0.0044	U	0.0047	U	0.0054	U	0.0037	U

Risk Additivity
Soil Analytical Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC542-IS-0001-070212		OTC542-IS-0002-070212-FD		OTC542-IS-0003-070212		OTC542-IS-0004-070212		OTC542-IS-0005-070212		OTC542-IS-0006-070212		OTC542-IS-0007-070212		OTC542-IS-0008-070212		OTC542-IS-0009-070212		OTC542-IS-0010-070212		OTC542-IS-0011-070212	
				Sample Date	7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012	
				Location	Station 1, septic tank influent						Station 2, septic tank				Station 3, septic tank effluent				Station 4, septic tank leach field							
				Depth (ft bgs)	3 - 5		3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		23 - 25	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																										
STYRENE	NE	6300	7280		0.0027	U	0.0024	U	0.0036	U	0.0023	U	0.0024	U	0.0026	U	0.0027	U	0.0025	U	0.0026	U	0.003	U	0.0021	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0021	U	0.0018	U	0.0028	U	0.0018	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.002	U	0.0023	U	0.0016	U
TETRACHLOROETHYLENE	NE	22	7.02		0.001	U	0.00092	U	0.0014	U	0.00089	U	0.00094	U	0.001	U	0.001	U	0.00096	U	0.001	U	0.0012	U	0.0008	U
TOLUENE	NE	5000	5270		0.0012	U	0.0011	U	0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0012	U	0.0014	U	0.00095	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0015	U	0.0014	U	0.0021	U	0.0013	U	0.0014	U	0.0015	U	0.0015	U	0.0014	U	0.0015	U	0.0017	U	0.0012	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0011	U	0.001	U	0.0015	U	0.00098	U	0.001	U	0.0011	U	0.0011	U	0.0011	U	0.0011	U	0.0013	U	0.00087	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0012	U	0.0011	U	0.0017	U	0.0011	U	0.0011	U	0.0012	U	0.0012	U	0.0012	U	0.0012	U	0.0014	U	0.00095	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0021	U	0.0018	U	0.0028	U	0.0018	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.002	U	0.0023	U	0.0016	U
VINYL CHLORIDE	NE	0.06	0.728		0.0015	U	0.0014	U	0.0021	U	0.0013	U	0.0014	U	0.0015	U	0.0015	U	0.0014	U	0.0015	U	0.0017	U	0.0012	U
XYLENES, TOTAL	NE	630	814		0.0033	U	0.003	U	0.0045	U	0.0028	U	0.003	U	0.0032	U	0.0033	U	0.0031	U	0.0032	U	0.0037	U	0.0025	U
SEMIVOLATILES (mg/kg)																										
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
2,4-DICHLOROPHENOL	NE	180	183		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.026	U	0.025	U	0.029	U	0.024	U	0.024	U	0.024	U	0.024	U	0.025	U	0.024	U	0.025	U	0.024	U
2,4-DINITROPHENOL	NE	120	122		0.42	U	0.39	U	0.46	U	0.37	U	0.38	U	0.38	U	0.38	U	0.39	U	0.38	U	0.4	U	0.39	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
2,6-DINITROTOLUENE	NE	61	61.1		0.025	U	0.023	U	0.027	U	0.022	U	0.023	U	0.023	U	0.022	U	0.023	U	0.022	U	0.024	U	0.023	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
2-CHLOROPHENOL	NE	390	391		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
2-METHYLNAPHTHALENE	NE	230	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
2-METHYLPHENOL	NE	3100	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
2-NITROANILINE	NE	610	NE		0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
2-NITROPHENOL	NE	NE	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
3-NITROANILINE	NE	NE	NE		0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.083	U	0.079	U	0.092	U	0.075	U	0.076	U	0.077	U	0.076	U	0.079	U	0.075	U	0.081	U	0.078	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
4-CHLOROANILINE	NE	2.4	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
4-NITROANILINE	NE	24	NE		0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
4-NITROPHENOL	NE	NE	NE		0.17	U	0.16	U	0.18	U	0.15	U	0.15	U	0.15	U	0.15	U	0.16	U	0.15	U	0.16	U	0.16	U
ACENAPHTHENE	NE	3400	3440		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
ACENAPHTHYLENE	NE	NE	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
ACETOPHENONE	NE	7800	7820		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
ANTHRACENE	NE	17000	17200		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
ATRAZINE	NE	2.1	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U

Risk Additivity
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Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC542-IS-0001-070212		OTC542-IS-0002-070212-FD		OTC542-IS-0003-070212		OTC542-IS-0004-070212		OTC542-IS-0005-070212		OTC542-IS-0006-070212		OTC542-IS-0007-070212		OTC542-IS-0008-070212		OTC542-IS-0009-070212		OTC542-IS-0010-070212		OTC542-IS-0011-070212	
				Sample Date	7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012	
				Location	Station 1, septic tank influent						Station 2, septic tank				Station 3, septic tank effluent				Station 4, septic tank leach field							
				Depth (ft bgs)	3 - 5		3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		23 - 25	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																										
BENZALDEHYDE	NE	7800	NE		0.21	U	0.2	U	0.23	U	0.19	U	0.19	U	0.19	U	0.19	U	0.2	U	0.19	U	0.2	U	0.19	U
BENZO(A)ANTHRACENE	NE	0.15	1.48		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	**0.032**	J	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
BENZO(A)PYRENE	NE	0.015	0.148		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	**0.0269**	J	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	**0.0308**	J	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
BENZO(G,H,I)PERYLENE	NE	NE	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	**0.0286**	J	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
BENZYL BUTYL PHTHALATE	NE	260	NE		0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
BIPHENYL	NE	51	57.1		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347		0.083	U	0.079	U	0.092	U	0.075	U	0.076	U	0.077	U	0.076	U	0.079	U	0.075	U	0.081	U	0.078	U
CAPROLACTAM	NE	31000	NE		0.067	U	0.063	U	0.074	U	0.06	U	0.061	U	0.061	U	0.061	U	0.063	U	0.06	U	0.064	U	0.062	U
CARBAZOLE	NE	NE	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
CHRYSENE	NE	15	148		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	**0.0399**	J	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
DIBENZOFURAN	NE	78	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
DIETHYL PHTHALATE	NE	49000	48900		0.083	U	0.079	U	0.092	U	0.075	U	0.076	U	0.077	U	0.076	U	0.079	U	0.075	U	0.081	U	0.078	U
DIMETHYL PHTHALATE	NE	611000	611000		0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
DI-N-BUTYL PHTHALATE	NE	6100	6110		0.083	U	0.079	U	0.092	U	0.075	U	0.076	U	0.077	U	0.076	U	0.079	U	0.075	U	0.081	U	0.078	U
DI-N-OCTYLPHTHALATE	NE	730	NE		0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
FLUORANTHENE	NE	2300	2290		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	**0.0342**	J	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
FLUORENE	NE	2300	2290		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
HEXACHLOROBENZENE	NE	0.3	3.04		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
HEXACHLOROBUTADIENE	NE	6.2	61.1		0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367		0.092	U	0.087	U	0.1	U	0.082	U	0.084	U	0.084	U	0.084	U	0.087	U	0.083	U	0.089	U	0.085	U
HEXACHLOROETHANE	NE	12	42.8		0.042	U	0.039	U	0.046	U	0.037	U	0.038	U	0.038	U	0.038	U	0.039	U	0.038	U	0.04	U	0.039	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
ISOPHORONE	NE	510	5120		0.021	U	0.02	UJ	0.023	UJ	0.019	UJ	0.019	UJ	0.019	UJ	0.019	UJ	0.02	UJ	0.019	UJ	0.02	UJ	0.019	UJ
M,P-CRESOL	NE	NE	NE		0.03	U	0.028	U	0.033	U	0.027	U	0.028	U	0.028	U	0.027	U	0.028	U	0.027	U	0.029	U	0.028	U
NAPHTHALENE	NE	3.6	43.0		0.033	U	0.032	U	0.037	U	0.03	U	0.031	U	0.031	U	0.03	U	0.031	U	0.03	U	0.032	U	0.031	U
NITROBENZENE	NE	4.8	53.5		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
N-NITROSODIPHENYLAMINE	NE	99	993		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
PENTACHLOROPHENOL	NE	0.89	8.94		0.25	U	0.24	U	0.28	U	0.22	U	0.23	U	0.23	U	0.23	U	0.24	U	0.23	U	0.24	U	0.23	U
PHENANTHRENE	NE	1830	1830		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
PHENOL	NE	18000	18300		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	0.019	U	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U
PYRENE	NE	1700	1720		0.021	U	0.02	U	0.023	U	0.019	U	0.019	U	**0.0325**	J	0.019	U	0.02	U	0.019	U	0.02	U	0.019	U

Risk Additivity
Soil Analytical Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC542-IS-0001-070212		OTC542-IS-0002-070212-FD		OTC542-IS-0003-070212		OTC542-IS-0004-070212		OTC542-IS-0005-070212		OTC542-IS-0006-070212		OTC542-IS-0007-070212		OTC542-IS-0008-070212		OTC542-IS-0009-070212		OTC542-IS-0010-070212		OTC542-IS-0011-070212	
			Sample Date	7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012	
			Location	Station 1, septic tank influent						Station 2, septic tank				Station 3, septic tank effluent				Station 4, septic tank leach field							
			Depth (ft bgs)	3 - 5		3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		23 - 25	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																									
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
1,3-DINITROBENZENE	NE	6.10	NE	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
2,4-DINITROTOLUENE	NE	1.60	15.7	0.094	U	0.076	U	0.086	U	0.071	U	0.086	U	0.092	U	0.084	U	0.084	U	0.08	U	0.086	U	0.088	U
2,6-DINITROTOLUENE	NE	61.0	61.1	0.084	U	0.068	U	0.077	U	0.063	U	0.077	U	0.082	U	0.076	U	0.075	U	0.071	U	0.077	U	0.079	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
2-NITROTOLUENE	NE	2.90	29.1	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
3-NITROTOLUENE	NE	6.10	7.82	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
4-NITROTOLUENE	NE	30.0	244.4	0.098	U	0.079	U	0.09	U	0.073	U	0.09	U	0.095	U	0.088	U	0.087	U	0.083	U	0.089	U	0.092	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
NITROBENZENE	NE	4.80	53.5	0.090	U	0.073	U	0.083	U	0.068	U	0.083	U	0.088	U	0.081	U	0.081	U	0.076	U	0.082	U	0.085	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
TETRYL	NE	240.0	244.0	0.078	U	0.063	U	0.071	U	0.058	U	0.071	U	0.075	U	0.07	U	0.069	U	0.066	U	0.071	U	0.073	U
METALS (mg/kg)																									
ALUMINUM	13700	77000	78000	**4570**		**4050**		**2230**		**4570**		**1760**		**5090**		**1740**		**6740**		**1830**		**2760**		**8930**	
ANTIMONY	1.6	31	31.3	1.1	U	0.94	U	0.88	U	0.82	U	1.4	U	1.2	U	1.1	U	0.95	U	1.1	U	1.1	U	0.85	U
ARSENIC	3.7	0.39	3.90	**1.5**	J	0.94	U	**1.2**	J	**1.1**	J	**0.84**	J	**1.3**	J	1.1	U	**2.1**	J	1.1	U	1.1	U	**2**	J
BARIUM	169	15000	15600	**52.8**	J	**47.9**	J	**26.6**	J	**46.2**	J	**20.2**	J	**52.5**	J	**19.4**	J	**83.1**	J	**21.9**	J	**36**	J	**87.7**	
BERYLLIUM	1.6	160	156	0.54	U	0.47	U	0.44	U	0.41	U	0.36	U	0.58	U	0.53	U	0.47	U	0.57	U	0.56	U	**0.49**	J
CADMIUM	0.3	70	70.3	0.54	U	0.47	U	0.44	U	0.41	U	0.72	U	0.58	U	0.53	U	0.47	U	0.57	U	0.56	U	0.43	U
CALCIUM	317000	NE	NE	**162000**		**211000**		**218000**		**114000**		**223000**		**246000**		**205000**		**203000**		**232000**		**248000**		**70800**	
CHROMIUM [d]	25	117000	117000	**4.4**	J	**3.5**	J	**3.3**	J	**6**		**2.2**	J	**6**		**1.6**	J	**5.9**		**1.5**	J	**2.4**	J	**10**	
COBALT	7.7	23	NE	**1.5**	J	**1.3**	J	**0.64**	J	**1.9**	J	**0.51**	J	**1.6**	J	0.53	U	**2.1**	J	0.57	U	**0.8**	J	**2.9**	J
COPPER	13	3100	3130	**3.5**	J	**3.3**	J	**1.8**	J	**2.5**	J	**1.1**	J	**4.2**	J	1.1	U	**5.6**	J	1.1	U	**2.7**	J	**4.2**	J
IRON	23000	55000	54800	**3840**		**3340**		**2100**		**4740**		**1730**		**4420**		**1620**		**5400**		**1610**		**2300**		**8470**	
LEAD	10.9	400	400	**4.3**	J	**3.4**	J	**8.9**		**3.2**	J	0.72	U	**3.6**	J	**1.1**	J	**3.4**	J	**1**	J	**2.2**	J	**6.2**	J
MAGNESIUM	17000	NE	NE	**5030**		**5310**		**1850**	J	**6760**		**1170**	J	**11500**		**1070**	J	**7240**		**1190**	J	**5160**		**4390**	
MANGANESE	393	1800	1860	**82.9**		**74.4**		**41.6**		**89.2**		**28.4**		**113**		**25.8**		**103**		**25**		**53.8**		**111**	
MERCURY	10.8	10	15.6	0.0099	U	0.0098	U	0.011	U	**0.0099**	J	0.0089	U	**0.015**	J	0.0091	U	0.0096	U	0.0093	U	0.0096	U	0.009	U
NICKEL	17.4	1500	1560	**3.6**	J	**3.2**	J	**1.9**	J	**5.3**	J	**1.4**	J	**4.4**	J	**1.2**	J	**5**	J	**1.2**	J	**2.1**	J	**7.4**	J
POTASSIUM	5080	NE	NE	**1370**	J	**1210**	J	**617**	J	**1190**	J	**578**	J	**1330**	J	**519**	J	**2040**	J	**588**	J	**695**	J	**1900**	J
SELENIUM	1.4	390	391	2.2	U	1.9	U	1.8	U	1.6	U	2.9	U	2.3	U	2.1	U	1.9	U	2.3	U	2.2	U	1.7	U
SILVER	1.1	390	391	0.54	U	0.47	U	0.44	U	0.41	U	0.36	U	0.58	U	0.53	U	0.47	U	0.57	U	0.56	U	0.43	U
SODIUM	5200	NE	NE	590	U	520	U	480	U	**504**	J	400	U	640	U	580	U	520	U	630	U	620	U	470	U
THALLIUM	1.3	0.78	0.782	1.4	U	1.2	U	1.1	U	1.1	U	1.9	U	1.5	U	1.4	U	1.2	U	1.5	U	1.5	U	1.1	U
VANADIUM	42.6	390	391	**8**	J	**7.4**	J	**4**	J	**10.6**	J	**5.2**	J	**9.8**	J	**3.8**	J	**12.2**	J	**2.9**	J	**5.3**	J	**15.1**	J
ZINC	54.6	23000	23500	**13.8**		**10.1**		**24.8**		**13.7**		**3.8**	J	**19.3**		**3.6**	J	**16**		**3.8**	J	**11.9**		**22.8**	

Risk Additivity
Soil Analytical Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC542-IS-0001-070212		OTC542-IS-0002-070212-FD		OTC542-IS-0003-070212		OTC542-IS-0004-070212		OTC542-IS-0005-070212		OTC542-IS-0006-070212		OTC542-IS-0007-070212		OTC542-IS-0008-070212		OTC542-IS-0009-070212		OTC542-IS-0010-070212		OTC542-IS-0011-070212	
				Sample Date	7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012	
				Location	Station 1, septic tank influent						Station 2, septic tank				Station 3, septic tank effluent				Station 4, septic tank leach field							
				Depth (ft bgs)	3 - 5		3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		0 - 2		23 - 25	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																										
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93		0.0081	U	0.0079	U	0.0092	UJ	0.0075	U	0.0078	U	0.0078	U	0.0076	U	0.0079	U	0.0076	U	0.008	U	0.0079	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49		0.01	U	0.0099	U	0.012	U	0.0094	U	0.0098	U	0.0098	U	0.0095	U	0.0098	U	0.0096	U	0.01	U	0.0099	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49		0.01	U	0.0099	U	0.012	U	0.0094	U	0.0098	U	0.0098	U	0.0095	U	0.0098	U	0.0096	U	0.01	U	0.0099	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22		0.0081	U	0.0079	U	0.0092	U	0.0075	U	0.0078	U	0.0078	U	0.0076	U	0.0079	U	0.0076	U	0.008	U	0.0079	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22		0.0081	U	0.0079	U	0.0092	U	0.0075	U	0.0078	U	0.0078	U	0.0076	U	0.0079	U	0.0076	U	0.008	U	0.0079	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12		0.0081	U	0.0079	U	0.0092	U	0.0075	U	0.0078	U	**0.0108**	J	0.0076	U	0.0079	U	0.0076	U	0.008	U	0.0079	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22		0.0081	U	0.0079	U	0.0092	UJ	0.0075	U	0.0078	U	0.0078	U	0.0076	U	0.0079	U	0.0076	U	0.008	U	0.0079	U
PETROLEUM HYDROCARBONS (mg/kg)																										
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000		3	U	2.8	U	4.3	U	2.4	U	2.8	U	2.8	U	3	U	2.9	U	3.1	U	3.3	U	2.7	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000		4.1	U	3.9	U	4.7	U	**5.31**	J	3.8	U	**4.83**	J	3.8	U	3.9	U	3.8	U	4	U	3.9	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000		4.1	U	3.9	U	4.7	U	**5.03**	J	3.8	U	**9.63**	J	3.8	U	3.9	U	3.8	U	4	U	3.9	U
CYANIDE (mg/kg)																										
CYANIDE	NE	22.0	46.9		0.074	U	0.071	U	0.084	U	0.13	U	0.067	U	0.07	U	0.068	U	0.067	U	0.069	U	0.071	U	0.068	U
TRITIUM (pCi/g)																										
TRITIUM	NE	NE	NE		5.95	U	5.9	U	5.71	U	5.73	U	5.93	U	5.95	U	5.99	U	5.35	U	5.98	U	5.97	U	5.66	U

Risk Additivity
Soil Analytical Data
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number		Risk Additivity Evaluation at Building 1166, Holloman AFB				
			Sample Date						
			Location						
			Depth (ft bgs)				0-10 ft bgs		
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]		Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
PERCENT SOLIDS	NE	NE	NE						
VOLATILES (mg/kg)									
1,1,1-TRICHLOROETHANE	NE	8700	15600		1,1,1-TRICHLOROETHANE		ND		
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		1,1,2,2-TETRACHLOROETHANE		ND		
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND		
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		1,1,2-TRICHLOROETHANE		ND		
1,1-DICHLOROETHANE	NE	3.3	64.5		1,1-DICHLOROETHANE		ND		
1,1-DICHLOROETHENE	NE	240	449		1,1-DICHLOROETHENE		ND		
1,2,4-TRICHLOROBENZENE	NE	22	73.0		1,2,4-TRICHLOROBENZENE		ND		
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		1,2-DIBROMO-3-CHLOROPROPANE		ND		
1,2-DIBROMOETHANE	NE	0.034	0.588		1,2-DIBROMOETHANE		ND		
1,2-DICHLOROBENZENE	NE	1900	2310		1,2-DICHLOROBENZENE		ND		
1,2-DICHLOROETHANE	NE	0.43	7.89		1,2-DICHLOROETHANE		ND		
1,2-DICHLOROPROPANE	NE	0.94	15.2		1,2-DICHLOROPROPANE		ND		
1,3-DICHLOROBENZENE	NE	NE	NE		1,3-DICHLOROBENZENE		ND		
1,4-DICHLOROBENZENE	NE	2.4	31.7		1,4-DICHLOROBENZENE		ND		
2-HEXANONE	NE	210	NE		2-HEXANONE		ND		
ACETONE	NE	61000	66600		ACETONE	N	0.135	0.0000020	
BENZENE	NE	1.1	15.4		BENZENE		ND		
BROMODICHLOROMETHANE	NE	0.27	5.41		BROMODICHLOROMETHANE		ND		
BROMOFORM	NE	62	616		BROMOFORM		ND		
BROMOMETHANE	NE	7.3	16.5		BROMOMETHANE		ND		
CARBON DISULFIDE	NE	820	1530		CARBON DISULFIDE		ND		
CARBON TETRACHLORIDE	NE	0.61	10.8		CARBON TETRACHLORIDE		ND		
CHLOROBENZENE	NE	290	376		CHLOROBENZENE		ND		
CHLOROETHANE	NE	15000	29800		CHLOROETHANE		ND		
CHLOROFORM	NE	0.29	5.86		CHLOROFORM		ND		
CHLOROMETHANE	NE	120	275		CHLOROMETHANE		ND		
CIS-1,2-DICHLOROETHYLENE	NE	160	156		CIS-1,2-DICHLOROETHYLENE		ND		
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		CIS-1,3-DICHLOROPROPENE		ND		
CYCLOHEXANE	NE	7000	NE		CYCLOHEXANE		ND		
DIBROMOCHLOROMETHANE	NE	0.68	12.1		DIBROMOCHLOROMETHANE		ND		
DICHLORODIFLUOROMETHANE	NE	94	168		DICHLORODIFLUOROMETHANE		ND		
ETHYLBENZENE	NE	5.4	68.4		ETHYLBENZENE		ND		
ISOPROPYLBENZENE	NE	2100	2430		ISOPROPYLBENZENE		ND		
METHYL ACETATE	NE	78000	78200		METHYL ACETATE		ND		
METHYL ETHYL KETONE	NE	28000	37100		METHYL ETHYL KETONE		ND		
METHYL ISOBUTYL KETONE	NE	5300	5820		METHYL ISOBUTYL KETONE		ND		
METHYLCYCLOHEXANE	NE	5630	5630		METHYLCYCLOHEXANE		ND		
METHYLENE CHLORIDE		56	409		METHYLENE CHLORIDE		ND		

Risk Additivity
Soil Analytical Data
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Holloman Air Force Base, New Mexico

Analyte			Sample Number	Risk Additivity Evaluation at Building 1166, Holloman AFB				
			Sample Date					
			Location					
			Depth (ft bgs)			0-10 ft bgs		
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
VOLATILES - continued (mg/kg)				VOLATILES - continued (mg/kg)				
STYRENE	NE	6300	7280	STYRENE		ND		
TERT-BUTYL METHYL ETHER	NE	43	901	TERT-BUTYL METHYL ETHER		ND		
TETRACHLOROETHYLENE	NE	22	7.02	TETRACHLOROETHYLENE		ND		
TOLUENE	NE	5000	5270	TOLUENE		ND		
TRANS-1,2-DICHLOROETHENE	NE	150	270	TRANS-1,2-DICHLOROETHENE		ND		
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	TRANS-1,3-DICHLOROPROPENE		ND		
TRICHLOROETHYLENE	NE	0.91	8.77	TRICHLOROETHYLENE		ND		
TRICHLOROFLUOROMETHANE	NE	790	1410	TRICHLOROFLUOROMETHANE		ND		
VINYL CHLORIDE	NE	0.06	0.728	VINYL CHLORIDE		ND		
XYLENES, TOTAL	NE	630	814	XYLENES, TOTAL		ND		
SEMIVOLATILES (mg/kg)				SEMIVOLATILES (mg/kg)				
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	2,2'-OXYBIS(1-CHLORO)PROPANE		ND		
2,4,5-TRICHLOROPHENOL	NE	6100	6110	2,4,5-TRICHLOROPHENOL		ND		
2,4,6-TRICHLOROPHENOL	NE	44	61.1	2,4,6-TRICHLOROPHENOL		ND		
2,4-DICHLOROPHENOL	NE	180	183	2,4-DICHLOROPHENOL		ND		
2,4-DIMETHYLPHENOL	NE	1200	1220	2,4-DIMETHYLPHENOL		ND		
2,4-DINITROPHENOL	NE	120	122	2,4-DINITROPHENOL		ND		
2,4-DINITROTOLUENE	NE	1.6	15.7	2,4-DINITROTOLUENE		ND		
2,6-DINITROTOLUENE	NE	61	61.1	2,6-DINITROTOLUENE		ND		
2-CHLORONAPHTHALENE	NE	6300	6260	2-CHLORONAPHTHALENE		ND		
2-CHLOROPHENOL	NE	390	391	2-CHLOROPHENOL		ND		
2-METHYLNAPHTHALENE	NE	230	NE	2-METHYLNAPHTHALENE		ND		
2-METHYLPHENOL	NE	3100	NE	2-METHYLPHENOL		ND		
2-NITROANILINE	NE	610	NE	2-NITROANILINE		ND		
2-NITROPHENOL	NE	NE	NE	2-NITROPHENOL		ND		
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	3,3'-DICHLOROBENZIDINE		ND		
3-NITROANILINE	NE	NE	NE	3-NITROANILINE		ND		
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	4,6-DINITRO-2-METHYLPHENOL		ND		
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	4-BROMOPHENYL PHENYL ETHER		ND		
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	4-CHLORO-3-METHYLPHENOL		ND		
4-CHLOROANILINE	NE	2.4	NE	4-CHLOROANILINE		ND		
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	4-CHLOROPHENYL PHENYL ETHER		ND		
4-NITROANILINE	NE	24	NE	4-NITROANILINE		ND		
4-NITROPHENOL	NE	NE	NE	4-NITROPHENOL		ND		
ACENAPHTHENE	NE	3400	3440	ACENAPHTHENE		ND		
ACENAPHTHYLENE	NE	NE	NE	ACENAPHTHYLENE		ND		
ACETOPHENONE	NE	7800	7820	ACETOPHENONE		ND		
ANTHRACENE	NE	17000	17200	ANTHRACENE		ND		
ATRAZINE	NE	2.1	NE	ATRAZINE		ND		

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Analyte			Sample Number		
			Sample Date		
			Location		
			Depth (ft bgs)		
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]		
SEMIVOLATILES - continued (mg/kg)					
BENZALDEHYDE	NE	7800	NE		
BENZO(A)ANTHRACENE	NE	0.15	1.48		
BENZO(A)PYRENE	NE	0.015	0.148		
BENZO(B)FLUORANTHENE	NE	0.15	1.48		
BENZO(G,H,I)PERYLENE	NE	NE	NE		
BENZO(K)FLUORANTHENE	NE	1.5	14.8		
BENZYL BUTYL PHTHALATE	NE	260	NE		
BIPHENYL	NE	51	57.1		
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE		
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68		
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347		
CAPROLACTAM	NE	31000	NE		
CARBAZOLE	NE	NE	NE		
CHRYSENE	NE	15	148		
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148		
DIBENZOFURAN	NE	78	NE		
DIETHYL PHTHALATE	NE	49000	48900		
DIMETHYL PHTHALATE	NE	611000	611000		
DI-N-BUTYL PHTHALATE	NE	6100	6110		
DI-N-OCTYLPHTHALATE	NE	730	NE		
FLUORANTHENE	NE	2300	2290		
FLUORENE	NE	2300	2290		
HEXACHLOROBENZENE	NE	0.3	3.04		
HEXACHLOROBUTADIENE	NE	6.2	61.1		
HEXACHLOROCYCLOPENTADIENE	NE	370	367		
HEXACHLOROETHANE	NE	12	42.8		
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48		
ISOPHORONE	NE	510	5120		
M,P-CRESOL	NE	NE	NE		
NAPHTHALENE	NE	3.6	43.0		
NITROBENZENE	NE	4.8	53.5		
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE		
N-NITROSODIPHENYLAMINE	NE	99	993		
PENTACHLOROPHENOL	NE	0.89	8.94		
PHENANTHRENE	NE	1830	1830		
PHENOL	NE	18000	18300		
PYRENE	NE	1700	1720		

Risk Additivity Evaluation at Building 1166, Holloman AFB

		0-10 ft bgs		
Analyte	**C / N**	**Max Hit (mg/kg)**	**Cancer Risk**	**NC ratio**
SEMIVOLATILES - continued (mg/kg)				
BENZALDEHYDE		ND		
BENZO(A)ANTHRACENE	C	0.032	2.17E-07	
BENZO(A)PYRENE	C	0.0269	1.82E-06	
BENZO(B)FLUORANTHENE	C	0.0308	2.09E-07	
BENZO(G,H,I)PERYLENE		ND		
BENZO(K)FLUORANTHENE	C	0.0286	1.94E-08	
BENZYL BUTYL PHTHALATE		ND		
BIPHENYL		ND		
BIS(2-CHLOROETHOXY) METHANE		ND		
BIS(2-CHLOROETHYL) ETHER		ND		
BIS(2-ETHYLHEXYL) PHTHALATE		ND		
CAPROLACTAM		ND		
CARBAZOLE		ND		
CHRYSENE	C	0.0399	2.70E-09	
DIBENZ(A,H)ANTHRACENE		ND		
DIBENZOFURAN		ND		
DIETHYL PHTHALATE		ND		
DIMETHYL PHTHALATE		ND		
DI-N-BUTYL PHTHALATE		ND		
DI-N-OCTYLPHTHALATE		ND		
FLUORANTHENE	N	0.0342		0.000015
FLUORENE		ND		
HEXACHLOROBENZENE		ND		
HEXACHLOROBUTADIENE		ND		
HEXACHLOROCYCLOPENTADIENE		ND		
HEXACHLOROETHANE		ND		
INDENO(1,2,3-C,D)PYRENE		ND		
ISOPHORONE		ND		
M,P-CRESOL		ND		
NAPHTHALENE		ND		
NITROBENZENE		ND		
N-NITROSODI-N-PROPYLAMINE		ND		
N-NITROSODIPHENYLAMINE		ND		
PENTACHLOROPHENOL		ND		
PHENANTHRENE		ND		
PHENOL		ND		
PYRENE	N	0.0325		0.000019

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Analyte			Sample Number		Risk Additivity Evaluation at Building 1166, Holloman AFB					
			Sample Date							
			Location					0-10 ft bgs		
			Depth (ft bgs)							
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]		Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio	
EXPLOSIVES (mg/kg)					EXPLOSIVES (mg/kg)					
1,3,5-TRINITROBENZENE	NE	2200.0	NE		1,3,5-TRINITROBENZENE		ND			
1,3-DINITROBENZENE	NE	6.10	NE		1,3-DINITROBENZENE		ND			
2,4,6-TRINITROTOLUENE	NE	19.0	39.1		2,4,6-TRINITROTOLUENE		ND			
2,4-DINITROTOLUENE	NE	1.60	15.7		2,4-DINITROTOLUENE		ND			
2,6-DINITROTOLUENE	NE	61.0	61.1		2,6-DINITROTOLUENE		ND			
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE		2-AMINO-4,6-DINITROTOLUENE		ND			
2-NITROTOLUENE	NE	2.90	29.1		2-NITROTOLUENE		ND			
3-NITROTOLUENE	NE	6.10	7.82		3-NITROTOLUENE		ND			
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE		4-AMINO-2,6-DINITROTOLUENE		ND			
4-NITROTOLUENE	NE	30.0	244.4		4-NITROTOLUENE		ND			
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2		HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE		ND			
NITROBENZENE	NE	4.80	53.5		NITROBENZENE		ND			
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7		OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE		ND			
TETRYL	NE	240.0	244.0		TETRYL		ND			
METALS (mg/kg)					METALS (mg/kg)					
ALUMINUM	13700	77000	78000		ALUMINUM	N	6740		0.086	
ANTIMONY	1.6	31	31.3		ANTIMONY		ND			
ARSENIC	3.7	0.39	3.90		ARSENIC	C	2.1	5.39E-06		
BARIUM	169	15000	15600		BARIUM	N	83.1		0.0053	
BERYLLIUM	1.6	160	156		BERYLLIUM		ND			
CADMIUM	0.3	70	70.3		CADMIUM		ND			
CALCIUM	317000	NE	NE		CALCIUM	NUTRIENT	248000			
CHROMIUM [d]	25	117000	117000		CHROMIUM d	N	6		0.000051	
COBALT	7.7	23	NE		COBALT	N	2.1		0.091	RSL
COPPER	13	3100	3130		COPPER	N	5.6		0.0018	
IRON	23000	55000	54800		IRON	N	5400		0.10	
LEAD	10.9	400	400		LEAD	N	4.3		0.011	
MAGNESIUM	17000	NE	NE		MAGNESIUM	NUTRIENT	11500			
MANGANESE	393	1800	1860		MANGANESE	N	113		0.061	
MERCURY	10.8	10	15.6		MERCURY	N	0.015			
NICKEL	17.4	1500	1560		NICKEL	N	5.3		0.0034	
POTASSIUM	5080	NE	NE		POTASSIUM	NUTRIENT	2040			
SELENIUM	1.4	390	391		SELENIUM		ND			
SILVER	1.1	390	391		SILVER		ND			
SODIUM	5200	NE	NE		SODIUM	NUTRIENT	640			
THALLIUM	1.3	0.78	0.782		THALLIUM		ND			
VANADIUM	42.6	390	391		VANADIUM	N	12.2		0.031	
ZINC	54.6	23000	23500		ZINC	N	19.3		0.00082	

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Analyte			Sample Number	
			Sample Date	
			Location	
			Depth (ft bgs)	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	
PCBs (mg/kg)				
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	
PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	
OIL RANGE ORGANICS C28-C40	NE	NE	1000	
CYANIDE (mg/kg)				
CYANIDE	NE	22.0	46.9	
TRITIUM (pCi/g)				
TRITIUM	NE	NE	NE	

Risk Additivity Evaluation at Building 1166, Holloman AFB

		0-10 ft bgs		
Analyte	**C / N**	**Max Hit (mg/kg)**	**Cancer Risk**	**NC ratio**
PCBs (mg/kg)				
PCB-1016 (AROCLOR 1016)		ND		
PCB-1221 (AROCLOR 1221)		ND		
PCB-1232 (AROCLOR 1232)		ND		
PCB-1242 (AROCLOR 1242)		ND		
PCB-1248 (AROCLOR 1248)		ND		
PCB-1254 (AROCLOR 1254)	C	0.0108		
PCB-1260 (AROCLOR 1260)		ND		
PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10		ND		
DIESEL RANGE ORGANICS C10-C28	N	5.31		0.0053
OIL RANGE ORGANICS C28-C40	N	9.63		0.0096
CYANIDE (mg/kg)				
CYANIDE	N	ND		
TRITIUM (pCi/g)				
TRITIUM		ND		
SUM:			**7.7E-06**	**0.41**

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Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, February, Table A-1 updated June 2012.*

[a] The background concentration is Total Chromium and the screening levels are Chromium (III).

AFB = Air Force Base
dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

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Appendix K
Ecological Evaluation

NEW MEXICO ENVIRONMENT DEPARTMENT
SITE ASSESSMENT CHECKLIST
(From NMED (2012) Attachment A)

I. SITE LOCATION

1. Site Name: Building 1166 (OT-C542) Inactive Septic System
   US EPA I.D. Number: NM6572124422
   Location: Tularosa Basin within Holloman Air Force Base (HAFB)
   County: Otero
   City: HAFB _____ State: NM

2. Latitude: 32º 53´ 10.232˝ N Longitude: 106º 8´ 45.207˝ W

3. Attach site maps, including a topographical map, a diagram which illustrates the layout of the facility (e.g., site boundaries, structures, etc.), and maps showing all habitat areas identified in Section III of the checklist. Also, include maps which illustrate known release areas, sampling locations, and any other important features, if available.

Note: Site maps and supporting information that include (1) a Physiographic Map, (2) a Site Layout and Sampling Location Map, and (3) a Site Photo Log are generally included for all sites in the RFI reports. A site habitat map and a Google Earth photo that shows the site habitat are attached to this Site Assessment checklist.

II. SITE CHARACTERIZATION

1. Indicate the approximate area of the site (i.e., acres or sq. ft): Approximately 2 acres

2. Provide an approximate breakdown of the land uses on the site:

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	_____% Undisturbed	100% Other[c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, etc.):
_____

[b]For agricultural areas, please list the crops and/or livestock which are present:
_____

[c]For areas designated as "other", please describe the usage of the area:
Building 1166 was constructed in 1960. The 4,955 square foot building is located at the south end of the High Speed Test Track, and is known as the Break Setter Building. Building 1166 contained two toilets, a lavatory, a urinal, and a shower

during the time it was connected to the septic system. The Septic Tanks Report (HAFB, 2007) indicates that the 450-gallon septic tank was removed as of 2006.

3. Provide an approximate breakdown of the land uses in the area surrounding the site. Indicate the radius (in miles) of the area described: approximately 0.5 mile

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	~50 % Undisturbed	~50 % Other [c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, golf course, etc.):

---

[b]For agricultural areas, please list the crops and/or livestock which are present:

---

[c]For areas designated as "other", please describe the usage of the area:
Habitat Map for Holloman AFB (attached Figure 1) shows that habitat within 0.5 mile radius contains approximately 50 percent classified as "Development/Ground Disturbance."

4. Describe reasonable and likely future land and/or water use(s) at the site.
Land use is likely to remain the same.

5. Describe the historical uses of the site. Include information on chemical releases that may have occurred as a result of previous land uses. For each chemical release, provide information on the form of the chemical released (i.e., solid, liquid, vapor) and the known or suspected causes or mechanism of the release (i.e., spills, leaks, material disposal, dumping, explosion, etc.).

According to information provided in the Holloman Air Force Base Septic Tanks Report (HAFB, 2007), Building 1166 was constructed in 1960. It is located at the south end of the High Speed Test Track, and is known as the Break Setter Building. Any releases that occurred at the site result from leaks associated with the former septic system.

6. If any movement of soil has taken place at the site, describe the degree of the disturbance. Indicate the likely source of any disturbances (e.g., erosion, agricultural, mining, industrial activities, removals, etc.) and estimate when these events occurred.

Site disturbances of soil have been limited to excavation activities associated with building construction and septic system installation and septic system closure activities.

7. Describe the current uses of the site. Include information on recent (previous 5 years) disturbances or chemical releases that have occurred. For each chemical release, provide information on the form of the chemical released and the causes or mechanism of the release.

According to information provided in the Holloman Air Force Base Septic Tanks Report (HAFB, 2007), Building 1166 was utilized as the Break Setter Building. Current site usage is the same.

8. Identify the location or suspected location of chemical releases at the site. Provide an estimate of the distance between these locations and the areas identified in Section III.

Chemical releases that may have occurred are associated with septic system leakage.

9. Identify the suspected contaminants of concern (COCs) at the site. If known, include the maximum contaminant levels. Please indicate the source of data cited (e.g., RFI, confirmatory sampling, etc.).

As documented in the RFI, detected constituents from soil samples collected include several metals, 7 SVOCs (all PAHs), and one VOC (acetone), Aroclor 1254, and petroleum hydrocarbons (both diesel and oil range). Additionally, samples were analyzed for explosives, cyanide, and tritium; however all were non-detect in soil samples from the site (for 0 to 10 feet bgs, the zone of interest for ecological receptors).

10. Identify the media (e.g., soil (surface or subsurface), surface water, air, groundwater) which are known or suspected to contain COCs. _____
Surface and subsurface soil, and potentially, groundwater

11. Indicate the approximate depth to groundwater (in feet below ground surface [(bgs)].

Depth to groundwater as measured from monitoring well OTC542-MW01 is 24.4 feet from top of PVC casing.

12. Indicate the direction of groundwater flow (e.g., north, southeast, etc.)

According to Section 3.4 of the RFI report, the direction of groundwater flow at Holloman AFB has been shown to be generally from northeast to southwest. The groundwater flow direction at Building 1166 is to the southeast.

III. HABITAT EVALUATION

III.A Wetland Habitats

Are any wetland[1] areas such as marshes or swamps on or adjacent to the site?

☐ Yes X No

If yes, indicate the wetland area on the attached site map and answer the following questions regarding the wetland area. If more than one wetland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wetland area. Distinguish between wetland areas by using names or other designations (such as location), and clearly identify each area on the site map. Also, obtain and attach a National Wetlands Inventory Map (or maps) to illustrate each wetland area.

Identify the sources of the observations and information (e.g., National Wetland Inventory, Federal or State Agency, USGS topographic maps) used to make the determination that wetland areas are or are not present.

USGS Topographic Maps

If no wetland areas are present, proceed to Section III.B.

1Wetlands are defined in 40 CFR §232.2 as " Areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Examples of typical wetlands plants include: cattails, cordgrass, willows and cypress trees. National wetland inventory maps may be available at http:\\nwi.fws.gov. Additional information on wetland delineation criteria is also available from the Army Corps of Engineers.

Wetland Area Questions

☐Onsite ☐Offsite

Name or
Designation:_____

1. Indicate the approximate area of the wetland (acres or ft^2)_____

2. Identify the type(s) of vegetation present in the wetland.

   - ❑ Submergent (i.e., underwater) vegetation
   - ❑ Emergent (i.e., rooted in the water, but rising above it) vegetation
   - ❑ Floating vegetation
   - ❑ Scrub/shrub
   - ❑ Wooded
   - ❑ Other (Please describe):_____

3. Estimate the vegetation density of the wetland area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Is standing water present? ☐Yes ☐No

   If yes, is the water primarily: ☐Fresh or ☐Brackish
   Indicate the approximate area of the standing water (ft^2): _____
   Indicate the approximate depth of the standing water, if known (ft. or in.)_____

5. If known, indicate the source of the water in the wetland.

   - ❑ Stream/River/Creek/Lake/Pond
   - ❑ Flooding
   - ❑ Groundwater
   - ❑ Surface runoff

6. Is there a discharge from the facility to the wetland? ☐Yes ☐No

   If yes, please
   describe:_____
   _____
   _____
   _____
   _____

Wetland Area Questions (Continued)

7. Is there a discharge from the wetland? ☐Yes ☐No
   If yes, indicate the type of aquatic feature the wetland discharges into:

   - ❑ Surface stream/River (Name:_____)
   - ❑ Lake/Pond (Name:_____)
   - ❑ Groundwater
   - ❑ Not sure

8. Does the area show evidence of flooding? ☐Yes ☐No
   If yes, indicate which of the following are present (mark all that apply):

   - ❑ Standing water
   - ❑ Water-saturated soils
   - ❑ Water marks
   - ❑ Buttressing
   - ❑ Debris lines
   - ❑ Mud cracks
   - ❑ Other (Please describe):_____

9. Animals observed in the wetland area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:
   _____
   _____
   _____
   _____

III.B Aquatic Habitats

III.B.1 Non-Flowing Aquatic Features

Are any non-flowing aquatic features (such as ponds or lakes) located at or adjacent to the site?

☐Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the non-flowing aquatic features. If more than one non-flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.B.2.

Non-Flowing Aquatic Feature Questions

☐Onsite ☐Offsite

Name or Designation:_____

1. Indicate the type of aquatic feature present:

   - ❑ Natural (e.g., pond or lake)
   - ❑ Man-made (e.g., impoundment, lagoon, canal, etc.)

2. Estimate the approximate size of the water body (in acres or sq. ft.)_____

3. If known, indicate the depth of the water body (in ft. or in.)._____

Non-Flowing Aquatic Feature Questions (Continued)

4. Indicate the general composition of the bottom substrate. Mark all sources that apply from the following list.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

☐ Other (please specify):_____

5. Indicate the source(s) of the water in the aquatic feature. Mark all sources that apply from the following list.

- ❑ River/Stream/Creek
- ❑ Groundwater
- ❑ Industrial Discharge
- ❑ Surface Runoff
- ❑ Other (please specify):_____

6. Is there a discharge from the facility to the aquatic feature? ☐Yes ☐No
   If yes, describe the origin of each discharge and its migration path:
   _____
   _____
   _____
   _____

7. Does the aquatic feature discharge to the surrounding environment? ☐Yes ☐ No
   If yes, indicate the features from the following list into which the aquatic feature discharges, and indicate whether the discharge occurs onsite or offsite:

- ❑ River/Stream/Creek ☐onsite ☐offsite
- ❑ Groundwater ☐onsite ☐offsite
- ❑ Wetland ☐onsite ☐offsite
- ❑ Impoundment ☐onsite ☐offsite
- ❑ Other (please describe)_____

Non-Flowing Aquatic Feature Questions (Continued)

8. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Fish
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, turtles)
- ❑ Amphibians (e.g., frogs, salamanders)
- ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

Specify species, if known:

_____
_____
_____
_____

III.B.2 Flowing Aquatic Features

Are any flowing aquatic features (such as streams or rivers) located at or adjacent to the site?

☐Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the flowing aquatic features. If more than one flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map

If no, proceed to Section III.C.

Flowing Aquatic Feature Questions

☐Onsite ☐Offsite

Name or Designation:_____

1. Indicate the type of flowing aquatic feature present.

   - ❑ River
   - ❑ Stream
   - ❑ Creek
   - ❑ Brook
   - ❑ Dry wash
   - ❑ Arroyo
   - ❑ Intermittent stream
   - ❑ Artificially created (ditch, etc.)
   - ❑ Other (specify)
   - ❑

2. Indicate the general composition of the bottom substrate.

   ☐ Bedrock ☐ Sand ☐ Concrete
   ☐ Boulder (>10 in.) ☐ Silt ☐ Debris
   ☐ Cobble (2.5 - 10 in.) ☐ Clay ☐ Detritus
   ☐ Gravel (0.1 - 2.5 in.) ☐ Muck (fine/black)
   ☐ Other (please specify):_____

3. Describe the condition of the bank (e.g., height, slope, extent of vegetative cover) of the aquatic feature.

   _____
   _____
   _____
   _____

4. Is there a discharge from the facility to the aquatic feature? ☐Yes ☐No
   If yes, describe the origin of each discharge and its migration path:

   _____
   _____
   _____
   _____

5. Indicate the discharge point of the water body. Specify name, if known.

   _____
   _____
   _____

Flowing Aquatic Feature Questions (Continued)

6. If the flowing aquatic feature is a dry wash or arroyo, answer the following questions.
   - ❑ Check here if feature is not a dry wash or arroyo

   If known, specify the average number of days in a year in which flowing water is present in the feature: _____

   Is standing water or mud present? Check all that apply.
   - ❑ Standing water
   - ❑ Mud
   - ❑ Neither standing water or mud

   Does the area show evidence of recent flow (e.g., flood debris clinging to vegetation)?
   - ❑ Yes
   - ❑ No
   - ❑ Not sure
7. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:

   _____
   _____
   _____
   _____

III.C Terrestrial Habitats

III.C.1 Wooded

Are any wooded areas on or adjacent to the site? ☐Yes X No

If yes, indicate the wooded area on the attached site map and answer the following questions. If more than one wooded area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wooded area. Distinguish between wooded areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.2.

Wooded Area Questions

☐On-site ☐Off-site

Name or Designation:_____

1. Estimate the approximate size of the wooded area (in acres or sq. ft.)

2. Indicate the dominant type of vegetation in the wooded area.

   - ❑ Evergreen
   - ❑ Deciduous
   - ❑ Mixed

Dominant plant species, if known:_____

3. Estimate the vegetation density of the wooded area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the predominant size of the trees at the site. Use diameter at chest height.

   - ❑ 0-6 inches
   - ❑ 6-12 inches
   - ❑ >12 inches
   - ❑ No single size range is predominant

5. Animals observed in the wooded area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:_____

III.C.2 Shrub/Scrub

Are any shrub/scrub areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the shrub/scrub area on the attached site map and answer the following questions. If more than one shrub/scrub area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual shrub/scrub area. Distinguish between shrub/scrub areas, using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.3.

Shrub/Scrub Area Questions

X Onsite X Offsite

Name or Designation: Chihuahuan Desert Scrub (HAFB, 2011).
Note also: On-site areas are almost entirely gravel covered and void of habitat or vegetation with some apparent pockets of desert vegetation. Surrounding site habitat is characterized as Chihuahuan Desert. The habitat map (Figure 1) shows that habitat surrounding the site is dominated by fourwing saltbush/alkali sacaton shrubland habitat.

1. Estimate the approximate size of the shrub/scrub area (in acres or sq. ft.). Surrounding HAFB are tens of thousands of acres of Chihuahuan Desert Scrub.

2. Indicate the dominant type of shrub/scrub vegetation present, if known.

According to information provided in Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011), the area around Building 1166 (OT-C542) is dominated by Fourwing Saltbush/Alkali Sacaton Shrubland.

3. Estimate the vegetation density of the shrub/scrub area.

- ❑ Dense (i.e., greater than 75% vegetation)
- X Moderate (i.e., 25% to 75% vegetation)
- ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the scrub/shrub vegetation.

- ❑ 0-2 feet
- X 2-5 feet
- ❑ >5 feet

5. Animals observed in the shrub/scrub area or suspected to be present based on indirect evidence or file material:
   - X Birds
   - X Mammals
   - X Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:
   The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna associated with the shrubland habitat potentially present in the area of Building 1166. Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam

kangaroo rat (*Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.3 Grassland

Are any grassland areas on or adjacent to the site? ☐Yes X No

If yes, indicate the grassland area on the attached site map and answer the following questions. If more than one grassland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual grassland area. Distinguish between grassland areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.4.

Grassland Area Questions

☐Onsite ☐Offsite

Name or Designation:_____

1. Estimate the approximate size of the grassland area (in acres or sq. ft.)._____

2. Indicate the dominant plant type, if known.
_____
_____
_____
_____

3. Estimate the vegetation density of the grassland area.

- ❑ Dense (i.e., greater than 75% vegetation)
- ❑ Moderate (i.e., 25% to 75% vegetation)
- ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the dominant plant type (in ft. or in.)_

5. Animals observed in the grassland area or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, lizards)
- ❑ Amphibians (e.g., toads, salamanders)

Specify species, if known:

III.C.4 Desert

Are any desert areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the desert area on the attached site map and answer the following questions. If more than one desert area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual desert area. Distinguish between desert areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.5.

Desert Area Questions

X Onsite X Offsite
Name or Designation: Chihuahuan Desert

1. Estimate the approximate size of the desert area (in acres or sq. ft.).
This site including HAFB is contained within tens of thousands of acres of the Chihuahuan Desert.

2. Describe the desert area (e.g., presence or absence of vegetation, vegetation types, presence/size of rocks, sand, etc.)
Many volumes of literature have been written on the natural biota of the Chihuahuan Desert. Detailed descriptions about the biotic communities within HAFB can be found in the HAFB Integrated Natural Resource Management Plan, (HAFB, 2011). Habitats directly associated with this Site include typical desert scrub communities.

3. Animals observed in the desert area or suspected to be present based on indirect evidence or file material:

X Birds
X Mammals
X Reptiles (e.g., snakes, lizards)
❑ Amphibians (e.g., toads, salamanders)

Specify species, if known:

The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna associated with the shrubland habitat potentially present in the area of Building 1166. Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam

kangaroo rat (*Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.5 Other

1. Are there any other terrestrial communities or habitats on or adjacent to the site which were not previously described?

☐Yes X No

If yes, indicate the "other" area(s) on the attached site map and describe the area(s) below. Distinguish between onsite and offsite areas. If no, proceed to Section III.D.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

III.D Sensitive Environments and Receptors

1. Do any other potentially sensitive environmental areas[2] exist adjacent to or within 0.5 miles of the site? If yes, list these areas and provide the source(s) of information used to identify sensitive areas. *Do not answer "no" without confirmation from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

The following is taken from the Integrated Natural Resources Management Plan for HAFB (HAFB,2011). HAFB and its Geographically Separated Units (GSUs) have high biodiversity, including many sensitive species. No threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The White Sands pupfish is not Federally-listed nor has critical habitat been designated because of the multi-agency cooperative agreement to manage the species to support viable populations through habitat management and research.

Most of the sensitive species are birds that are either associated with grassland habitats on main base or with wetland habitats, primarily in the Lake Holloman Public Access Area

2 Areas that provide unique and often protected habitat for wildlife species. These areas are typically used during critical life stages such as breeding, hatching, rearing of young and overwintering. Refer to **Table 1** at the end of this document for examples of sensitive environments.

wetlands complex south of the Cantonment. Sensitive grassland and desert species at HAFB that are discussed in further detail in the management plan include:

- White Sands pupfish
- Acarospora clauzadeana lichen
- Grassland neotropical migratory birds
- Western burrowing owl
- Aplomado falcon
- Grassland raptors
- Bats
- Texas horned lizard and other reptiles

2. Are any areas on or near (i.e., within 0.5 miles) the site which are owned or used by local tribes? If yes, describe. *Contact the Tribal Liason in the Office of the Secretary (505)827-2855 to obtain this information.*

No

3. Does the site serve or potentially serve as a habitat, foraging area, or refuge by rare, threatened, endangered, candidate and/or proposed species (plants or animals), or any otherwise protected species? If yes, identify species. *This information should be obtained from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

No, based on information in the Integrated Natural Resources Management Plan, no threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The plan establishes protocols for management of sensitive desert and grassland habitats.

4. Is the site potentially used as a breeding, roosting or feeding area by migratory bird species? If yes, identify which species.

Likely not. The site has very limited viable habitat due to the disturbed nature of the site, but areas surrounding the site could potentially provide habitat for these purposes.

5. Is the site used by any ecologically[3], recreationally, or commercially important

3 Ecologically important species include populations of species which provide a critical (i.e., not replaceable) food resource for higher organisms and whose function as such would not be replaced by more tolerant species; or perform a critical ecological function (such as organic matter decomposition) and whose functions will not be replaced by other species. Ecologically important species include pest and opportunistic species that populate an area if they serve as a food source for other species, but do not include domesticated animals (e.g., pets and livestock) or plants/animals whose existence is maintained by continuous human interventions (e.g., fish hatcheries, agricultural crops, etc.,)

species? If yes, explain.

No

IV. EXPOSURE PATHWAY EVALUATION

1. Do existing data provide sufficient information on the nature, rate, and extent of contamination at the site?

   X Yes
   ❑ No
   ❑ Uncertain

   Please provide an explanation for your answer: Sample results have sufficiently characterized the site.

2. Do existing data provide sufficient information on the nature, rate, and extent of contamination in offsite affected areas?

   □ Yes
   ❑ No
   ❑ Uncertain
   X No offsite contamination

   Please provide an explanation for your answer:
   No offsite contamination is expected, and no off-site soil or groundwater samples were collected.

3. Do existing data address potential migration pathways of contaminants at the site?

X Yes
❑ No
❑ Uncertain

Please provide an explanation for your answer

While potential migration from impacted soils to groundwater might occur, no ecological exposure to groundwater is expected.

4. Do existing data address potential migration pathways of contaminants in offsite affected areas?

□ Yes
❑ No
❑ Uncertain
X No offsite contamination

Please provide an explanation for your answer:

See response to No. 3 presented previously. Also, no off-site soil contamination is expected.

5. Are there visible indications of stressed habitats or receptors on or near (i.e., within 0.5 miles) the site that may be the result of a chemical release? If yes, explain. Attach photographs if available.

No.

6. Is the location of the contamination such that receptors might be reasonably expected to come into contact with it? For soil, this means contamination in the soil 0 to 5 feet below ground surface (bgs). If yes, explain.

Yes. Some soil samples were collected in site areas where receptors might contact detected constituents.

7. Are receptors located in or using habitats where chemicals exist in air, soil, sediment or surface water? If yes, explain.

Yes. See response to No. 6 presented above.

8. Could chemicals reach receptors via groundwater? Can chemicals leach or dissolve to groundwater? Are chemicals mobile in groundwater? Does groundwater discharge into receptor habitats? If yes, explain.

No Groundwater does not discharge into receptor habitats at or near the site.

9. Could chemicals reach receptors through runoff or erosion? Answer the following questions:

What is the approximate distance from the contaminated area to the nearest watercourse or arroyo?

- ❑ 0 feet (i.e., contamination has reached a watercourse or arroyo)
- ❑ 1-10 feet
- ❑ 11-20 feet
- ❑ 21-50 feet
- ❑ 51-100 feet
- ❑ 101-200 feet
- ❑ > 200 feet
- ❑ > 500 feet
- X > 1000 feet

What is the slope of the ground in the contaminated area?

- X 0-10%
- ❑ 10-30%
- ❑ > 30%

What is the approximate amount of ground and canopy vegetative cover in the contaminated area?

- ❑ < 25%
- X 25-75%
- ❑ > 75%

Is there visible evidence of erosion (e.g., a rill or gully) in or near the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

Do any structures, pavement, or natural drainage features direct run-on flow (i.e., surface flows originating upstream or uphill from the area of concern) into the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

10. Could chemicals reach receptors through the dispersion of contaminants in air (e.g., volatilization, vapors, fugitive dust)? If yes, explain.

Yes. However, detected concentrations of constituents in soil do not generally exceed relevant background values or ecological screening criteria (see screening assessment in main text).

11. Could chemicals reach receptors through migration of non-aqueous phase liquids (NAPLs)? Is a NAPL present at the site that might be migrating towards receptors or habitats? Could NAPL discharge contact receptors or their habitat?

No NAPLs are present at the site.

12. Could receptors be impacted by external irradiation at the site? Are gamma emitting radionuclides present at the site? Is the radionuclide contamination buried or at the surface?

No. No radionuclide contamination is expected to be present at the site.

PHOTOGRAPHIC DOCUMENTATION

During the site visit(s), photographs should be taken to document the current conditions at the site and to support the information entered in the checklist. For example, photographs may be used to document the following:

- The nature, quality, and distribution of vegetation at the site
- Receptors or evidence of receptors
- Potentially important ecological features, such as ponds and drainage ditches
- Potential exposure pathways
- Any evidence of contamination or impact

SUMMARY OF OBSERVATIONS AND SITE SETTING

Include information on significant source areas and migration pathways that are likely to constitute complete exposure pathways.

Although potentially complete exposure pathways exist (e.g. direct contact with surface soil), significant source areas are not present, as results of the screening assessment (see main text) indicate that detected concentrations of constituents in soil do not generally exceeding relevant ecological screening criteria.

Checklist Completed by William Squire

Affiliation CB&I Federal Services, LLC.

Author Assisted by William Stanhope, CB&I Federal Services, LLC.

Date_July 17, 2013

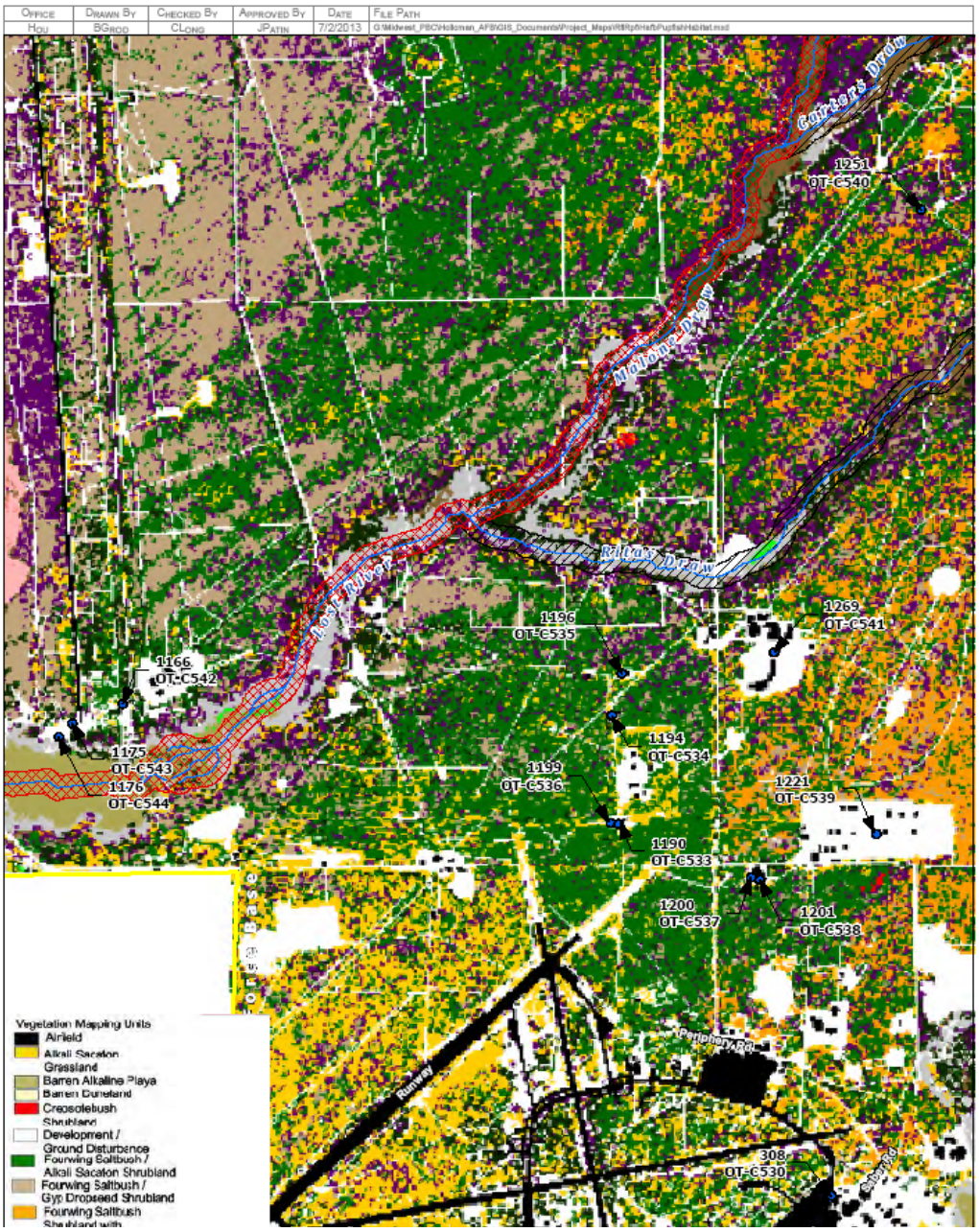
REFERENCES

Holloman Air Force Base (HAFB), 2011. *Integrated Natural Resource Management Plan*, February.

Holloman Air Force Base (HAFB), 2007. *Holloman Air Force Base Septic Tanks*, April.

New Mexico Environment Department (NMED), 2012. *Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document*, Hazardous Waste Bureau and Ground Water Quality Bureau, February, Table A-1 updated June 2012.

Building 1166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7/2/2013
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Conners Draw
Malone Draw
Rattan Draw
Rattlesnake Draw
1251
OT-C540
1269
OT-C541
1196
OT-C535
1166
OT-C542
1194
OT-C534
1175
OT-C543
1199
OT-C536
1176
OT-C544
1221
OT-C539
1190
OT-C533
1200
OT-C537
1201
OT-C538
308
OT-C530
Peripheral Rd
Runway
Vegetation Mapping Units
Airfield
Alkali Sacaton Grassland
Barren Alkaline Playa
Barren Duneland
Creosotebush Shrubland
Development / Ground Disturbance
Fourwing Saltbush / Alkali Sacaton Shrubland
Fourwing Saltbush / Gyp Dropseed Shrubland
Fourwing Saltbush Shrubland with

TABLE 1
EXAMPLES OF SENSITIVE ENVIRONMENTS

National Parks and National Monuments

Designated or Administratively Proposed Federal Wilderness Areas

National Preserves

National or State Wildlife Refuges

National Lakeshore Recreational Areas

Federal land designated for protection of natural ecosystems

State land designated for wildlife or game management

State designated Natural Areas

Federal or state designated Scenic or Wild River

All areas that provide or could potentially provide critical habitat[1] for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern

All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes

All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)

All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)

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1 Critical habitats are defined by the Endangered Species Act (50 CFR §424.02(d)) as:

> 1) Specific areas within the geographical area currently occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (ii) that may require special management considerations or protection, and 2) Specific areas outside the geographical area occupied by a species at the time it is listed upon a determination by the Secretary [of Interior] that such areas are essential for the conservation of the species.

All areas that provide or could potentially provide habitat for song birds as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-13)

All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)

All areas that provide or could potentially provide habitat for horned toads and Bullfrogs as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, resp.)

All perennial waters (e.g., rivers, lakes, playas, sloughs, ponds, etc)

All ephemeral drainage (e.g., arroyos, puddles/pools, intermittent streams, etc) that provide significant wildlife habitat or that could potentially transport contaminants off site to areas that provide wildlife habitat

All riparian habitats

All perennial and ephemeral wetlands (not limited to jurisdictional wetlands)

All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle.

ATTACHMENT B

ECOLOGICAL SITE EXCLUSION CRITERIA CHECKLIST AND DECISION TREE

1. NEW MEXICO ECOLOGICAL EXCLUSION CRITERIA CHECKLIST

The following questions are designed to be used in conjunction with the Ecological Exclusion Criteria Decision Tree (Figure 1). After answering each question, refer to the Decision Tree to determine the appropriate next step. In some cases, questions will be omitted as the user is directed to another section as indicated by the flow diagram in the Decision Tree. For example, if the user answers "yes" to Question 1 of Section I, he or she is directed to proceed to Section II.

I. Habitat

In the following questions, "affected property" refers to all property on which a release has occurred or is believed to have occurred, including off-site areas where contamination may have occurred or migrated.

1. Are any of the below-listed sensitive environments at, adjacent to, or in the locality1 of the affected property?

   - National Park or National Monument
   - Designated or administratively proposed Federal Wilderness Area
   - National Preserve
   - National or State Wildlife Refuge
   - Federal or State land designated for wildlife or game management
   - State designated Natural Areas
   - All areas that are owned or used by local tribes
   - All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle
   - All areas that provide or could potentially provide habitat for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern
   - All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes
   - All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)
   - All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)
   - All areas that provide or could potentially provide habitat for song birds as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game

1 *Locality* of the site refers to any area where an ecological receptor is likely to contact site-related chemicals. The locality of the site considers the likelihood of contamination migrating over time and places the site in the context of its general surrounding. Therefore, the locality is typically larger than the site and the areas adjacent to the site.

and Fish, 17-2-13)

- All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)
- All areas that provide or could potentially provide habitat for horned toads and bullfrogs as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, respectively)

2. Does the affected property contain land areas which were not listed in Question 1, but could be considered viable ecological habitat? The following are examples (but not a complete listing) of viable ecological habitats:

- Wooded areas
- Shrub/scrub vegetated areas
- Open fields (prairie)
- Other grassy areas
- Desert areas
- Any other areas which support wildlife and/or vegetation, excluding areas which support only opportunistic species (such as house mice, Norway rats, pigeons, etc.) that do not serve as prey to species in adjacent habitats.

The following features are <u>not</u> considered ecologically viable:

- Pavement
- Buildings
- Paved areas of roadways
- Paved/concrete equipment storage pads
- Paved manufacturing or process areas
- Other non-natural surface cover or structure

3. Does the affected property contain any perennial or ephemeral aquatic features which were not listed in Question 1?

II. Receptors

1. Is any part of the affected property used for habitat, foraging area, or refuge by any rare, threatened, or endangered species (plant *or* animal), or otherwise protected species (e.g., raptors, migratory birds)?

2. Is any part of the affected property used for habitat, foraging area, or refuge by any species used as a recreational (e.g., game animals) and/or commercial resource?

3. Is any part of the affected property used for habitat, foraging area, or refuge by any plant or animal species? This includes plants considered "weeds" and opportunistic insect and animal species (such as cockroaches and rats) if they are used as a food source for other species in the area.

III. Exposure Pathways

1. Could receptors be impacted by contaminants via direct contact?

   Is a receptor located in or using an area where it could contact contaminated air, soil[3], or surface water?

For Questions 2 and 3, note that one must answer "yes" to all three bullets in order to be directed to the "exclusion denied" box of the decision tree. This is because answering "no" to one of the questions in the bullet list indicates that a complete exposure pathway is not present. For example, in Question 2, if the chemical cannot leach or dissolve to groundwater (bullet 1), there is no chance of ecological receptors being exposed to the chemical through contact with contaminated groundwater. Similarly, the responses to the questions in Question 4 determine whether a complete pathway exists for exposure to NAPL.

2. Could receptors contact contaminants via groundwater?
   - Can the chemical leach or dissolve to groundwater[4]?
   - Can groundwater mobilize the chemical?
   - Could (does) contaminated groundwater discharge into known or potential receptor habitats?

3. Could receptors contact contaminants via runoff (i.e., surface water and/or suspended sediment) or erosion by water or wind?
   - Are chemicals present in surface soils?
   - Can the chemical be leached from or eroded with surface soils?
   - Is there a receptor habitat located downgradient of the leached/eroded surface soil?

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3 For soil, this means contamination less than 5 feet below ground surface (bgs).

4 Information on the environmental fate of specific chemicals can be found on the Internet at *http://www.epa.gov/opptintr/chemfact/* or at a local library in published copies of the *Hazardous Substances Data Bank*.

4. Could receptors contact contaminants via migration of non-aqueous phase liquids (NAPL)?

- Is NAPL present at the site?
- Is NAPL migrating toward potential receptors or habitats?
- Could NAPL discharge impact receptors or habitats?

Figure 1 -Ecological Exclusion Criteria Decision Tree

(Refer to corresponding checklist for the full text of each question)

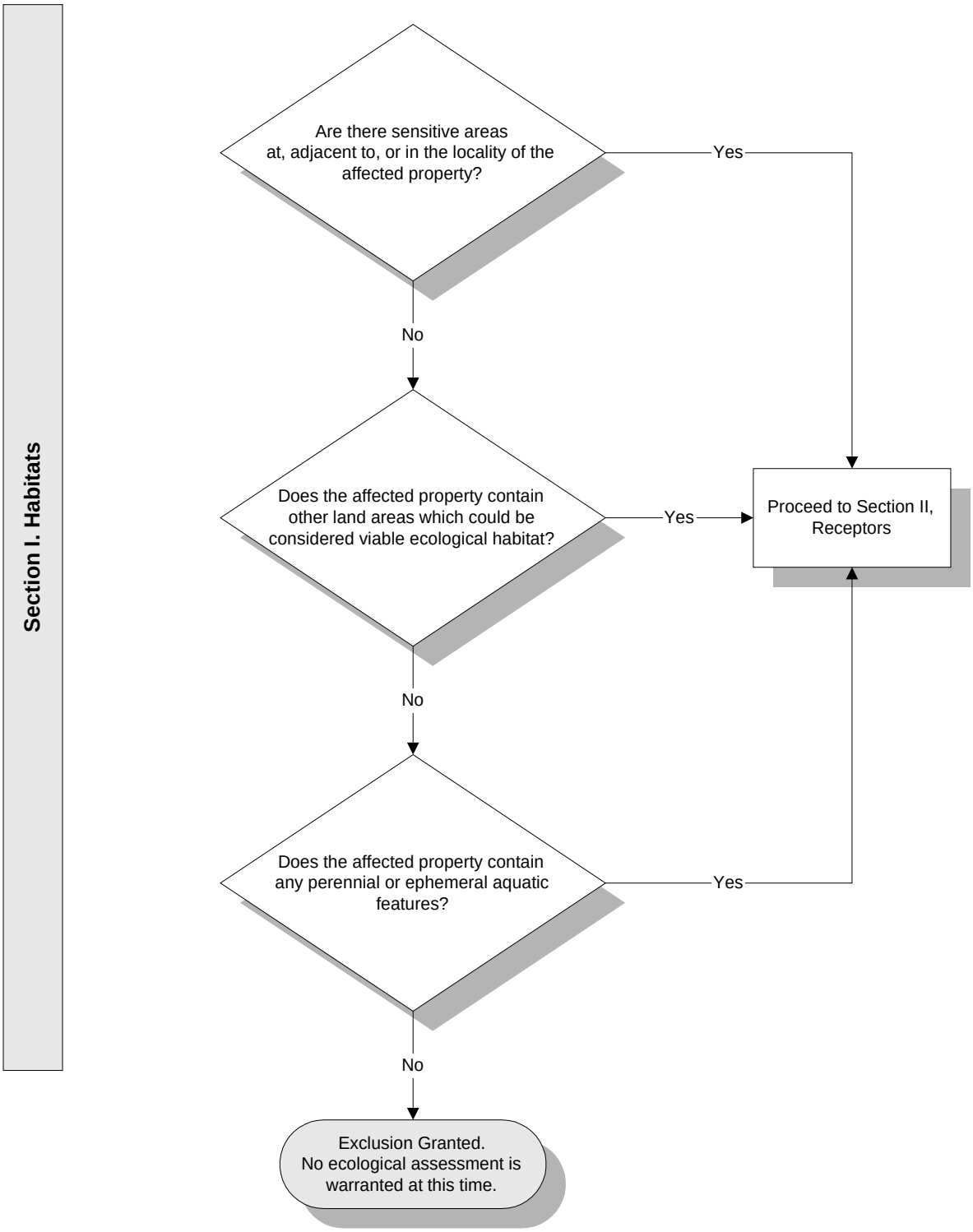

Figure 1 - Exclusion Criteria Decision Tree (continued)

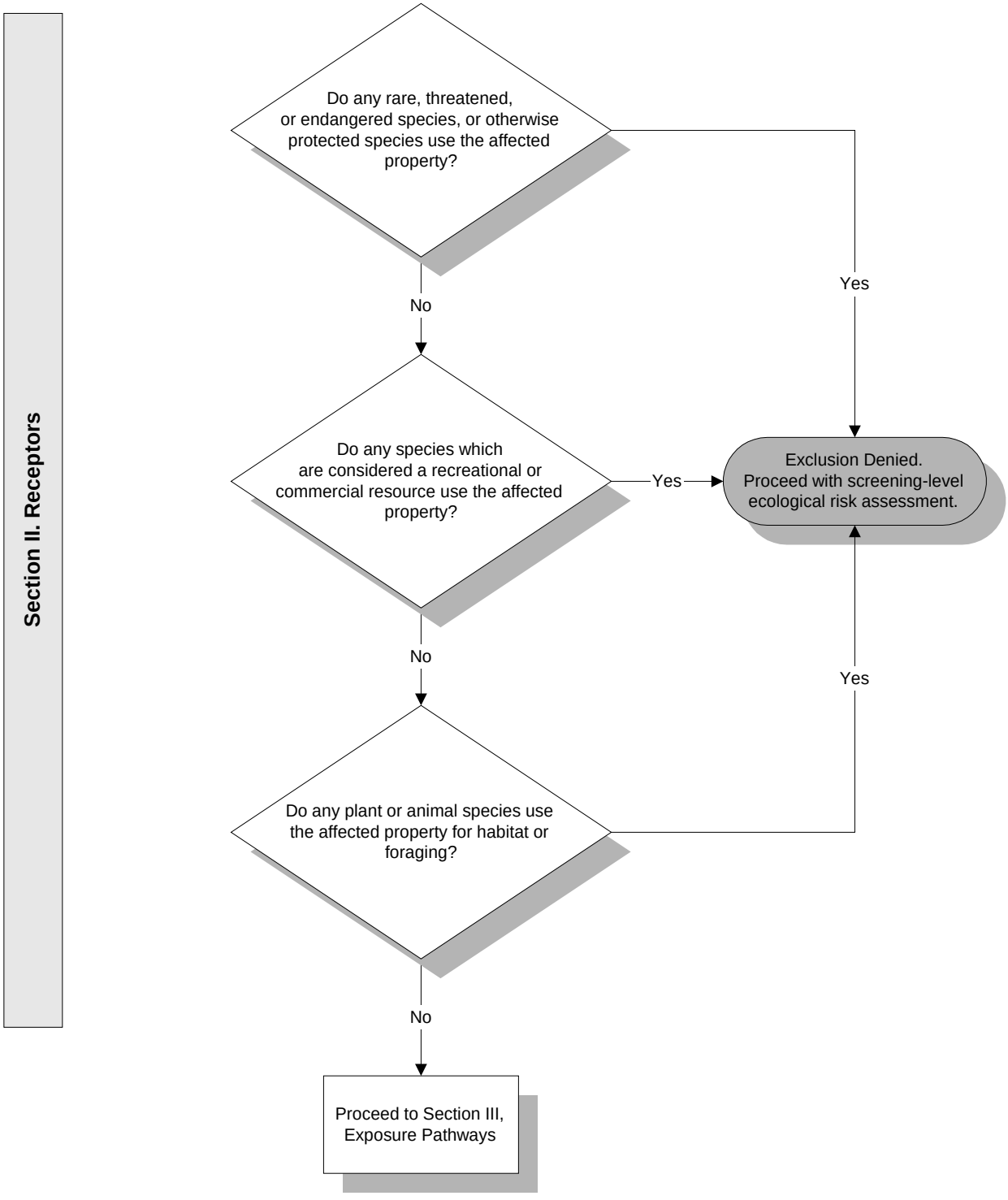

Figure 1 - Exclusion Criteria Decision Tree (continued)

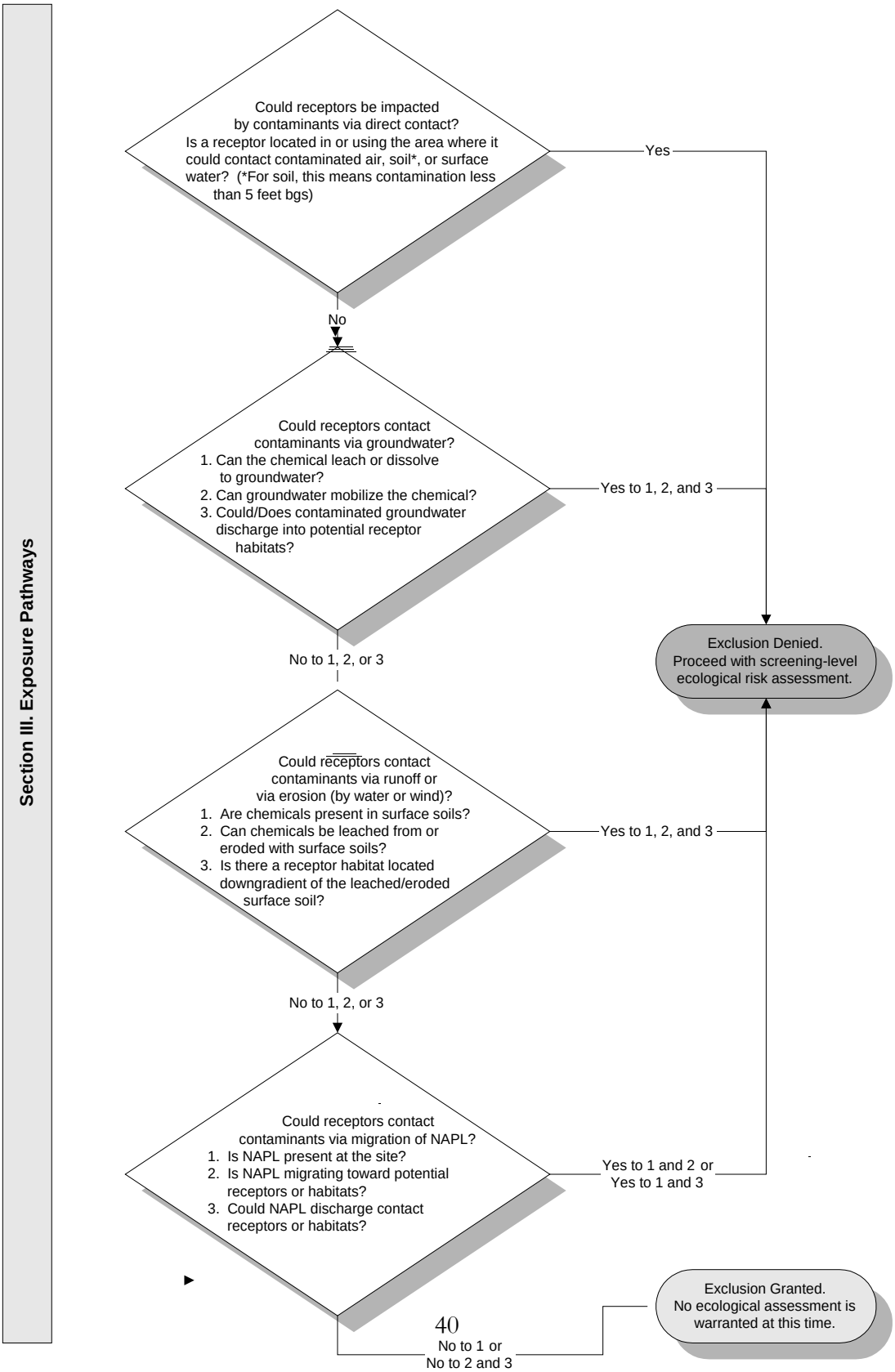

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1166 (OT-C542) RFI Report
Holloman Air Force Base, New Mexico

Analyte		Sample Number	OTC542-IS-0001-070212		OTC542-IS-0002-070212-FD		OTC542-IS-0004-070212		OTC542-IS-0006-070212		OTC542-IS-0008-070212		OTC542-IS-0010-070212	
		Sample Date	7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012		7/2/2012	
		Location	Station 1, septic tank influent				Station 2, septic tank		Station 3, septic tank effluent		Station 4, septic tank leach field			
		Depth (ft bgs)	3 - 5		3 - 5		7 - 9		3 - 5		3 - 5		0 - 2	
	Background Values - Soil (mg/kg)[a]	LANL (2012) ESLs (mg/kg)	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	**81.4**		**84**		**88.7**		**85.5**		**83.9**		**82.5**	
VOLATILES (mg/kg)														
ACETONE	NE	1.2 / 6.3	**0.107**		**0.0822**		0.018	U	0.02	U	0.019	U	**0.135**	
SEMIVOLATILES (mg/kg)														
BENZO(A)ANTHRACENE	NE	0.8 / 8	0.021	U	0.02	U	0.019	U	**0.032**	J	0.02	U	0.02	U
BENZO(A)PYRENE	NE	53 / 170	0.021	U	0.02	U	0.019	U	**0.0269**	J	0.02	U	0.02	U
BENZO(B)FLUORANTHENE	NE	18 / 180	0.021	U	0.02	U	0.019	U	**0.0308**	J	0.02	U	0.02	U
BENZO(K)FLUORANTHENE	NE	62 / 620	0.021	U	0.02	U	0.019	U	**0.0286**	J	0.02	U	0.02	U
CHRYSENE	NE	2.4 / 24	0.021	U	0.02	U	0.019	U	**0.0399**	J	0.02	U	0.02	U
FLUORANTHENE	NE	10 / 23	0.021	U	0.02	U	0.019	U	**0.0342**	J	0.02	U	0.02	U
PYRENE	NE	10 / 20	0.021	U	0.02	U	0.019	U	**0.0325**	J	0.02	U	0.02	U
METALS (mg/kg)														
ALUMINUM	13700	pH Dependent	**4570**		**4050**		**4570**		**5090**		**6740**		**2760**	
ARSENIC	3.7	6.8 / 68	**1.5**	J	0.94	U	**1.1**	J	**1.3**	J	**2.1**	J	1.1	U
BARIUM	169	110 / 260	**52.8**	J	**47.9**	J	**46.2**	J	**52.5**	J	**83.1**	J	**36**	J
CALCIUM	317000	NSV	**162000**		**211000**		**114000**		**246000**		**203000**		**248000**	
CHROMIUM	25	28 / 280	**4.4**	J	**3.5**	J	**6**		**6**		**5.9**		**2.4**	J
COBALT	7.7	13 / 130	**1.5**	J	**1.3**	J	**1.9**	J	**1.6**	J	**2.1**	J	**0.8**	J
COPPER	13	15 / 46	**3.5**	J	**3.3**	J	**2.5**	J	**4.2**	J	**5.6**	J	**2.7**	J
IRON	23000	NSV	**3840**		**3340**		**4740**		**4420**		**5400**		**2300**	
LEAD	10.9	14 / 28	**4.3**	J	**3.4**	J	**3.2**	J	**3.6**	J	**3.4**	J	**2.2**	J
MAGNESIUM	17000	NSV	**5030**		**5310**		**6760**		**11500**		**7240**		**5160**	
MANGANESE	393	220 / 1,100	**82.9**		**74.4**		**89.2**		**113**		**103**		**53.8**	
MERCURY	10.8	0.013 / 0.13	0.0099	U	0.0098	U	**0.0099**	J	**0.015**	J	0.0096	U	0.0096	U
NICKEL	17.4	9.7 / 19	**3.6**	J	**3.2**	J	**5.3**	J	**4.4**	J	**5**	J	**2.1**	J
POTASSIUM	5080	NSV	**1370**	J	**1210**	J	**1190**	J	**1330**	J	**2040**	J	**695**	J
SODIUM	5200	NSV	590	U	520	U	**504**	J	640	U	520	U	620	U
VANADIUM	42.6	0.025 / 0.25	8	J	7.4	J	10.6	J	9.8	J	12.2	J	5.3	J
ZINC	54.6	48 / 480	**13.8**		**10.1**		**13.7**		**19.3**		**16**		**11.9**	
PCBs (mg/kg)														
PCB-1254 (AROCLOR 1254)	NE	0.041 / 0.41	0.0081	U	0.0079	U	0.0075	U	**0.0108**	J	0.0079	U	0.008	U
PETROLEUM HYDROCARBONS (mg/kg)														
DIESEL RANGE ORGANICS C10-C28	NE	NE	4.1	U	3.9	U	**5.31**	J	**4.83**	J	3.9	U	4	U
OIL RANGE ORGANICS C28-C40	NE	NE	4.1	U	3.9	U	**5.03**	J	**9.63**	J	3.9	U	4	U

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
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Holloman Air Force Base, New Mexico

LANL (2012) ESL values represented as: No-Effect ESL / Low-Effect ESL (e.g., 1.2 / 6.3 for acetone)

LANL (2012) ESL Exceeded

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *Los Alamos National Laboratory (LANL), 2012, ECORISK Database, LA-UR-12-24548, Release 3.1, October.*

[c] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
ESL = ecological screening level
HAFB = Holloman Air Force Base
IS = investigative soil (sample)
J = estimated value
LANL = Los Alamos National Laboratory
mg/kg = milligrams per kilogram
NE = not established
NMED = New Mexico Environment Department
NSV = no screening value (available)
RCRA = Resource Recovery and Conservation Act
RFI = RCRA Facility Investigation
U = not detected at the detection limit shown
VQ = validation qualifier

1				**General UCL Statistics for Data Sets with Non-Detects**								
2			**User Selected Options**									
3			From File	WorkSheet.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	**Mercury (mg/kg)**											
10												
11						**General Statistics**							
12						Number of Valid Data	6			Number of Detected Data	2	
13						Number of Distinct Detected Data	2			Number of Non-Detect Data	4	
14										Percent Non-Detects	66.67%	
15												
16						**Raw Statistics**				**Log-transformed Statistics**		
17						Minimum Detected	0.0099			Minimum Detected	-4.615	
18						Maximum Detected	0.015			Maximum Detected	-4.2	
19						Mean of Detected	0.0125			Mean of Detected	-4.407	
20						SD of Detected	0.00361			SD of Detected	0.294	
21						Minimum Non-Detect	0.0096			Minimum Non-Detect	-4.646	
22						Maximum Non-Detect	0.0099			Maximum Non-Detect	-4.615	
23												
24	Note: Data have multiple DLs - Use of KM Method is recommended									Number treated as Non-Detect	4	
25	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected	2	
26	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage	66.67%	
27												
28	**Warning: Data set has only 2 Distinct Detected Values.**											
29	**This may not be adequate enough to compute meaningful and reliable test statistics and estimates.**											
30	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
31												
32	**Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.**											
33												
34	**The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.**											
35	**Those methods will return a 'N/A' value on your output display!**											
36												
37	**It is necessary to have 4 or more Distinct Values for bootstrap methods.**											
38	**However, results obtained using 4 to 9 distinct values may not be reliable.**											
39	**It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.**											
40												
41												
42						**UCL Statistics**							
43						**Normal Distribution Test with Detected Values Only**				**Lognormal Distribution Test with Detected Values Only**			
44						Shapiro Wilk Test Statistic	N/A			Shapiro Wilk Test Statistic	N/A	
45						5% Shapiro Wilk Critical Value	N/A			5% Shapiro Wilk Critical Value	N/A	
46						**Data not Normal at 5% Significance Level**				**Data not Lognormal at 5% Significance Level**		
47												
48						**Assuming Normal Distribution**				**Assuming Lognormal Distribution**		
49						DL/2 Substitution Method				DL/2 Substitution Method		
50						Mean	0.00739			Mean	-5.02	
51						SD	0.00424			SD	0.492	
52						95% DL/2 (t) UCL	0.0109			95% H-Stat (DL/2) UCL	0.0133	

53												
54					Maximum Likelihood Estimate(MLE) Method	N/A					Log ROS Method	
55					**MLE method failed to converge properly**						Mean in Log Scale	N/A
56											SD in Log Scale	N/A
57											Mean in Original Scale	N/A
58											SD in Original Scale	N/A
59											95% t UCL	N/A
60											95% Percentile Bootstrap UCL	N/A
61											95% BCA Bootstrap UCL	N/A
62											95% H-UCL	N/A
63												
64					**Gamma Distribution Test with Detected Values Only**						**Data Distribution Test with Detected Values Only**	
65					k star (bias corrected)	N/A					**Data do not follow a Discernable Distribution (0.05)**	
66					Theta Star	N/A						
67					nu star	N/A						
68												
69					A-D Test Statistic	N/A					**Nonparametric Statistics**	
70					5% A-D Critical Value	N/A					Kaplan-Meier (KM) Method	
71					K-S Test Statistic	N/A					Mean	0.0108
72					5% K-S Critical Value	N/A					SD	0.0019
73					**Data not Gamma Distributed at 5% Significance Level**						SE of Mean	0.0011
74											95% KM (t) UCL	0.013
75					**Assuming Gamma Distribution**						95% KM (z) UCL	0.0126
76					Gamma ROS Statistics using Extrapolated Data						95% KM (jackknife) UCL	0.0147
77					Minimum	N/A					95% KM (bootstrap t) UCL	0.0108
78					Maximum	N/A					95% KM (BCA) UCL	0.015
79					Mean	N/A					95% KM (Percentile Bootstrap) UCL	0.015
80					Median	N/A					95% KM (Chebyshev) UCL	0.0155
81					SD	N/A					97.5% KM (Chebyshev) UCL	0.0176
82					k star	N/A					99% KM (Chebyshev) UCL	0.0217
83					Theta star	N/A						
84					Nu star	N/A					**Potential UCLs to Use**	
85					AppChi2	N/A					95% KM (t) UCL	0.013
86					95% Gamma Approximate UCL (Use when n >= 40)	N/A					95% KM (% Bootstrap) UCL	0.015
87					95% Adjusted Gamma UCL (Use when n < 40)	N/A						
88	**Note: DL/2 is not a recommended method.**											
89												
90	**Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.**											
91	**These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).**											
92	**For additional insight, the user may want to consult a statistician.**											
93												

Final

RCRA Facility Investigation Report
Group 1 – Building 1175 (OT-C543)
Holloman Air Force Base, New Mexico

Prepared for U.S. Air Force Civil Engineer Center
2261 Hughes Ave., Suite 155
Lackland Air Force Base, Texas 78236-9861

Prepared by Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

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Project No. 144106
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Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)

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Acronyms and Abbreviations

AFB	Air Force Base
bgs	below ground surface
COPC	constituent of potential concern
DPT	direct push technology
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
ft	foot/feet
GPR	ground-penetrating radar
GRO	gasoline range organics
HI	hazard index
IDW	investigation-derived waste
MDL	method detection limit
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MCL	maximum contaminant level
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
ORO	oil range organics
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RSL	Regional Screening Level
Shaw	Shaw Environmental & Infrastructure, Inc. (a CB&I Company)
SSL	soil screening level
SVOC	semivolatile organic compound
TAL	target analyte list
TDS	total dissolved solids
TPH	total petroleum hydrocarbons
VOC	volatile organic compound
WQS	water quality standard

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1.0 INTRODUCTION

Shaw Environmental & Infrastructure. Inc. (Shaw), a CB&I company, prepared this Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for the Air Force Civil Engineer Center (formerly the Air Force Center for Engineering and the Environment) under Contract No. FA8903-09-D-8580, Task Order No. 0013, Modification 01. Results presented in this report are from the investigation and corrective measures of the removed septic tank formerly located at Building 1175 (OT-C543) at Holloman Air Force Base (AFB), New Mexico, which was one of the fifteen Group 1 septic tank sites under the Midwestern Region Performance-Based Remediation Contract. This RFI Report has been prepared pursuant to the requirements of the Holloman AFB Hazardous Waste Facility RCRA Permit No. NM6572124422 (the Permit) (New Mexico Environment Department [NMED], 2004). The purpose of this RFI was to delineate potential contamination that may have been released to the environment from the Building 1175 septic tank system.

Holloman AFB is situated in south-central New Mexico in the northwest central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). The 15 Group 1 former septic tank sites are located throughout Holloman AFB (Figure 1-2). Each former septic tank is positioned adjacent to a building; as such, each septic tank is named in reference to its most proximal building, as follows: OT-C530 (Building 308), OT-C531 (Buildings 920, 921, and 922), OT-C532 (Building 924), OT-C533 (Building 1190), OT-C534 (Building 1194), OT-C535 (Building 1196), OT-C536 (Building 1199), OT-C537 (Building 1200), OT-C538 (Building 1201), OT-C539 (Building 1221), OT-C540 (Building 1251), OT-C541 (Building 1269), OT-C542 (Building 1166), OT-C543 (Building 1175), and OT-C544 (Building 1176). This report presents a summary of the RFI work conducted at removed septic tank OT-C543 at Building 1175.

Building 1175 was constructed in 1949. The 3,200-square foot (ft) building is located at the south end of the High Speed Test Track, and is known as the Launch Control Facility. Building 1175 contained a lavatory and janitorial sink during the time it was connected to the septic system. The *Holloman Air Force Septic Tanks* (U.S. Air Force, 2007) report (included as Appendix A) indicated that the 2,970-gallon septic tank was removed as of 2006.

1.1 Purpose of the Investigation

Investigative activities were undertaken at Holloman AFB to determine the nature and extent of contamination, and propose recommendations for either closure or additional corrective action, if necessary, at 15 inactive, abandoned, or removed septic tank systems, following the

general guidance for closing septic systems found in 20.7.3.307 New Mexico Administrative Code (NMAC) Standards – Abandoned Sewers and On-Site Liquid Waste Systems.

Project quality objectives for each septic tank site consisted of the following:

- Gather and review all site historical information
- Identify septic tank components and historical uses
- Remove septic tank contents and contaminated soil (where necessary), and abandon the tank (where necessary)
- Determine the nature and extent of residual constituents of concern at each site, including potential pathways to groundwater
- Evaluate the risk at each site
- Develop conclusions and recommendations for each site.

This RFI Report presents the data collected to meet these project quality objectives at the Building 1175 abandoned septic tank.

1.2 Scope of Activities

This RFI Report describes all activities associated with the removed septic tank investigation and remediation at Building 1175, including soil and groundwater sampling, sample analysis, as-built pipe mapping, and site boundary survey. All work was performed in accordance with the *Holloman AFB Basewide Septic Tank Solid Waste Management Unit RFI Work Plan* (U.S. Army Corps of Engineers [USACE], 2010) and the *Quality Program Plan* (Shaw, 2012a). The *Quality Program Plan* (Shaw, 2012a) contains the Site Safety and Health Plan; the Uniform Federal Policy–Sampling and Analysis Plan/Quality Assurance Project Plan; and the Construction Quality Plan, which defines the methodology and practices that were used to control construction work during the performance of the RFI.

1.3 Regulatory Setting

The Permit (NMED, 2004) established the general and specific standards and activities for managing hazardous waste pursuant to Subtitle C of RCRA, the New Mexico Hazardous Waste Act, and the New Mexico Hazardous Waste Management Regulations. The Permit also set forth requirements for investigation, notification, corrective action, and reporting for the storage, management, and releases of hazardous wastes.

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The 15 septic systems were either abandoned, inactive, or previously removed as indicated in *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) report in Appendix A, and were not listed in the Permit (NMED, 2004). The *RFI Work Plan* (USACE, 2010) was approved by NMED in a letter dated January 13, 2010 (NMED, 2010). The NMED-approved *RFI Work Plan* (USACE, 2010) contained investigation activities only; therefore, Shaw submitted a *Voluntary Corrective Measure Request* (Shaw, 2012b) to include remediation and closure tasks that address septic system abandonment using 20.7.3.307 NMAC (Abandoned Sewers and On-Site Liquid Waste Systems). NMED has primary regulatory responsibility for the septic system sites; therefore, corrective action must be performed under Title 20 NMAC.

The septic tank investigations were based on action/cleanup levels stipulated in Appendix 4-F of the Permit to be protective of human health and the environment. Permit Appendix 4-F specifies that soil contaminant concentrations be compared with the NMED residential soil screening levels (SSL), as presented in the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a), or the U.S. Environmental Protection Agency (EPA) Regional Screening Levels (RSL) if no NMED SSL has been established (EPA, 2012a). Holloman AFB also has NMED-approved background values for metals in soil (NMED, 2012b).

For groundwater, the Permit specifies that the more stringent of either the New Mexico Water Quality Control Commission (NMWQCC) water quality standards (WQS) (20.6.2 NMAC), or the EPA maximum contaminant levels (MCLs) for drinking water, be used for comparison with measured sample concentrations (EPA, 2012b).

1.4 RFI Report Organization

This RFI Report is organized into the following sections:

- **Section 1.0, Introduction**: Identifies the objectives and purpose of this report.
- **Section 2.0, Environmental Setting**: Provides pertinent descriptions of history, location, physiography, topography, surface water, hydrology, regional geology, soil types, regional hydrogeology, climate, current and future land use, and current and future water use for Holloman AFB.
- **Section 3.0, Source Characterization**: Presents the data collection techniques and locations, as well as analytical methods.
- **Section 4.0, Investigation Results and Evaluation**: Details the soil analytical results, and evaluates the human health risk due to site contaminants.

- **Section 5.0, Data Quality Assurance and Data Quality Control Review**: Summarizes the analytical data validation results.

- **Section 6.0, Conclusions and Recommendations**: Presents the conclusions and recommendations of this RFI report.

- **Section 7.0, References**: Lists the references cited in this report.

In addition to the figures and tables listed in the table of contents, the following appendices are included in this report:

- **Appendix A** – Historical Records
- **Appendix B** – Geophysical Report
- **Appendix C** – Sample Collection Logs
- **Appendix D** – Boring Logs
- **Appendix E** – Well Construction Diagrams
- **Appendix F** – Well Purge Records
- **Appendix G** – Site Survey Data
- **Appendix H** – Laboratory Analytical Data and Data Validation Checklists
- **Appendix I** – Waste Manifests
- **Appendix J** – Risk Evaluation Calculations
- **Appendix K** – Ecological Evaluation.

2.0 ENVIRONMENTAL SETTING

This section provides background information for Holloman AFB including physical setting, history, topography, climate, soils, geology, hydrology, and land and water use.

2.1 Physical Setting

Holloman AFB is situated in south-central New Mexico, in the northwest-central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). Holloman AFB has a population of 6,000, and occupies 59,639 acres in the northeast quarter of Section 1, Township 17 South, Range 8 East. The White Sands Missile Range testing facilities occupy additional land extending northward from the base. Privately- and publicly-owned lands border the remainder of Holloman AFB. The major highway servicing Holloman AFB is Highway 70, which runs southwest from the town of Alamogordo, New Mexico, and separates Holloman AFB from publicly owned lands to the south. Alamogordo, New Mexico, which has a population of 30,401 according to the 2010 U.S. Census, is located approximately 7 miles east of the base.

2.2 Holloman Air Force Base History

Holloman AFB was first established in 1942 as Alamogordo Army Air Field. From 1942 through 1945, Alamogordo Army Air Field served as the training grounds for over 20 different flight groups, flying primarily B-17s, B-24s, and B-29s. After World War II, most operations had ceased at the base. In 1947, Air Material Command announced the air field would be its primary site for the testing and development of unmanned aircraft, guided missiles, and other research programs. On January 13, 1948, the Alamogordo installation was renamed in honor of the late Colonel George V. Holloman, a pioneer in guided missile research. In 1968, the 49th Tactical Fighter Wing arrived at Holloman AFB, and has remained since. Today, Holloman AFB also serves as the training center for the German Air Force's Tactical Training Center.

2.3 Physiography and Topography

Holloman AFB is located within the Sacramento Mountains physiographic province on the western edge of the Sacramento Mountains. The base is approximately 59,600 acres in area, and is located at a mean elevation of 4,093 ft above mean sea level. The region is characterized by high tablelands with rolling summit plains; cuesta-formed mountains dipping eastward; and west-facing escarpments, with the wide bracketed basin forming the basin and range complex. Holloman AFB is located in the Tularosa Basin, which is part of the Central Closed Basins. The bordering mountains rise abruptly to altitudes of 7,000 to 12,000 ft above mean sea level. The San Andres Mountains bound the basin to the west

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(approximately 30 miles) with the Sacramento Mountains approximately 10 miles to the east (Figure 2-1). At its widest, the basin is approximately 60 miles east to west, and stretches approximately 150 miles north to south.

2.4 Climate

As a whole, New Mexico has a mild, arid to semiarid continental climate characterized by light precipitation totals, abundant sunshine, relatively low humidity, and relatively large annual and diurnal temperature ranges (Western Regional Climate Center, 2013). The climate of the Central Closed Basins varies with elevation. The base is located in the low areas and is characterized by warm temperatures and dry air. Daytime temperatures often exceed 100 degrees Fahrenheit in the summer months, and are in the middle 50s (degrees Fahrenheit) in the winter. A preponderance of clear skies and relatively low humidity permits rapid nighttime cooling resulting in average diurnal temperature ranges of 25 to 35 degrees Fahrenheit. Potential evapotranspiration, at 67 inches per year, significantly exceeds annual precipitation, usually less than 15 inches. Arid conditions resulting from very low rainfall amounts, coupled with the topographically induced wind patterns combining with the sparse vegetation, tend to cause localized “dust devils.” The annual rainfall for Alamogordo, New Mexico is 12 inches per year. Much of the precipitation falls during the midsummer monsoonal period (July and August) as brief, yet frequent, intense thunderstorms culminating in 30 to 40 percent of the total annual rainfall.

2.5 Regional Geology and Soils

2.5.1 Geology

The sedimentary rocks that make up the adjacent mountain ranges are between 250 and 500 million years old (New Mexico Bureau of Geology and Mineral Resources, 2012). During the period when the area was submerged beneath the shallow intracontinental sea, the layers of limestone, shale, gypsum, and sandstone were formed. In time, these layers were pushed upward through various tectonic forces forming a large bulge on the surface. Approximately 10 million years ago, the center began to subside resulting in a vertical drop of thousands of ft, leaving the edges still standing (the present-day Sacramento and San Andres mountain ranges). In the millions of years following, rainfall, snowmelt, and wind eroded the mountain sediments depositing them in the valley (i.e., Tularosa Basin). Water carrying eroded limestone, dolomite, gravel, and other materials continue to flow into the basin.

As the Tularosa Basin is a bolson, which is a basin with no surface drainage outlet, sediments carried by surface water into a closed basin are bolson deposits. The overlying alluvium generally consists of unconsolidated gravels, sands, and clays. Soils in the basin are derived from the adjacent ranges as erosional deposits of limestone, dolomite, and gypsum. A fining

sequence from the ranges towards the basin's center characterizes the area with the near-surface soils as alluvial, eolian, and lacustrine deposits. The alluvial fan deposits are laterally discontinuous units of interbedded sand, silt, and clay while the eolian deposits consist primarily of gypsum sands. The eolian and alluvial deposits are usually indistinguishable due to the reworking of the alluvial sediment by eolian processes. The playa, or lacustrine deposits, consist of clay containing gypsum and are contiguous with the alluvial fan and eolian deposits throughout the base. Stiff caliche layers, varying in thickness, have been identified at different areas of the base.

2.5.2 Soils

The U.S. Natural Resources Conservation Service (formerly the Soil Conservation Service) has identified two soil associations in the vicinity of Holloman AFB: (1) the Holloman-Gypsum Land-Yesum Complex, and (2) the Mead silty clay loam (Figure 2-2) (U.S. Department of Agriculture, 1981). The permeability of these horizons ranges from 4×10^{-4} to 1×10^{-3} centimeters per second.

The Holloman-Gypsum Land-Yesum Complex, 0 to 5 percent sloped soil, consists of larger areas of shallow and deep, well-drained soils and areas of exposed gypsum. The Holloman soil makes up approximately 35 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 13 inches of the substratum is pink, very fine sandy loam that is very high in gypsum. Below that, the substratum is white gypsum to a depth of more than 60 inches. This soil is calcareous and mildly alkaline to moderately alkaline. Permeability is moderate. Available water capacity is very low.

Gypsum Land makes up approximately 30 percent of the Holloman-Gypsum Land-Yesum Complex (0 to 5 percent slopes). Typically, less than 1 inch of very fine sandy loam overlies soft to hard, white gypsum. The deep Yesum consists of very fine sandy loam that makes up approximately 20 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 9 inches of the substratum is light brown, fine sandy loam that is very high in gypsum. Below that, the substratum is pink, very fine sandy loam to a depth of more than 60 inches. The soil is calcareous throughout, and is mildly alkaline. Permeability is moderate. Available water capacity is moderate. Many fine gypsum crystals are found throughout the profile.

The soil type found across the main drainage area for the installation is Mead silty clay loam, 0 to 1 percent slopes. This deep, poorly drained, nearly level soil is on outer fringes of alluvial fans. This soil formed in fine textured alluvium over lacustrine lake sediment. It is very high in salt content because of periodic flooding and poor drainage. Slopes are smooth and concave. Typically, the surface layer is reddish brown, silty clay loam, and clay loam

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approximately 5 inches thick. The substratum, to a depth of 48 inches, is light reddish brown clay that has a high content of salt. Below that, the substratum is lacustrine material of variable texture and color to a depth of more than 60 inches. Included within this soil are areas of Holloman soils and Gypsum Land along the margins of the unit of steep, short gully sides and knolls. These inclusions make up approximately 15 percent of the map unit for this soil type. Individual areas are generally smaller than 10 acres. This soil is moderately calcareous throughout and is moderately to strongly alkaline. It has a layer of salt that is more soluble than gypsum. Permeability is very low. Available water capacity is low (USACE, 2010).

2.6 Regional Hydrogeology

Groundwater occurs as an unconfined aquifer in the unconsolidated deposits of the central basin, with the primary source of recharge as rainfall percolation and minor amounts of stream runoff along the western edge of the Sacramento Mountains. Surface water/rainfall migrates downward into the alluvial sediments at the edge of the shallow aquifer near the ranges and flows through progressively finer-grained sediments towards the central basin. Because the Tularosa Basin is a closed system, water that enters the area leaves either through evaporation or percolation. This elevated amount of percolation results in a fairly high water table. Beneath Holloman AFB, groundwater ranges from 5 to 50 ft below ground surface (bgs). Flow for the base is generally towards the southwest with localized influences from the variations in the topography of the base (Figure 2-3). In the northern and western portions of the base, groundwater flows more to the west towards the Ritas Draw, Malone Draw, and Lost River drainages. Groundwater flow is affected by local topography in areas immediately adjacent to arroyos, where groundwater flows directly toward the drainages regardless of the regional flow pattern.

Groundwater in the Tularosa Basin is of potable quality at the recharge areas in close proximity to the Sacramento Mountains and becomes increasingly mineralized toward the central portion of the basin and discharge areas. The majority (over 70 percent) of the Environmental Restoration Program sites located across Holloman AFB have groundwater monitoring wells containing water with an average total dissolved solids (TDS) concentration greater than 10,000 milligrams per liter (mg/L). These TDS data support the hypothesis that TDS concentrations below 10,000 mg/L at Holloman AFB are caused by dilution of natural groundwater quality from leaking water lines and surface irrigation from the domestic water supply. TDS concentrations greater than 10,000 mg/L exceed the NMWQCC limit as potable water (20.6.2 NMAC), and thus, the groundwater beneath Holloman AFB has been designated as unfit for human consumption. Likewise, the EPA guidelines have identified the groundwater as a Class IIIB water source, characterized by TDS concentrations exceeding 10,000 mg/L, and is characterized by a low degree of

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interconnection with adjacent surface water or groundwater of a higher class. Groundwater does not discharge or connect to any adjacent aquifers, because the Tularosa Basin is a closed basin. Adjacent surface waters include Lost River and Lake Holloman, which also have high concentrations of TDS, and are not considered potential drinking water sources.

2.7 Surface Water and Hydrology

The Tularosa Basin contains all of the surface flow in its boundaries. The nearest inflow of surface waters to Holloman AFB comes from the Lost River, located in the north-central region of the base. The upper reaches of the Three Rivers and the Sacramento River are perennial in the basin. Holloman AFB is dissected by several southwest-trending arroyos that control the surface drainage. Hay Draw arroyo is located in the far north. Malone and Ritas Draws, which drain into the Lost River and Dillard Draw arroyos, are located along the eastern perimeter of the base. Approximately 10,000 years ago, indications are that a much wetter climate existed. The present-day Lake Otero encompassed a much larger area, possibly upwards of several hundred square miles. Its remains are the Alkali Flat and Lake Lucero. Lake Lucero is a temporary feature of merely a few inches in depth during the rainy season.

Ancient lakes and streams deposited water-bearing deposits over the older bedrock basement materials. Fractures, cracks, and fissures in the Permian and Pennsylvanian bedrock yield small quantities of relatively good-quality water in the deeper peripheral. Potable water is only found from wells near the edges of the basin, with more saline water towards the center. Two of the principal sources of potable water are: (1) a long narrow area on the upslope sides of Tularosa and Alamogordo, and (2) in the far southwestern part of the basin. A portion of the city of Alamogordo's water, as well as Holloman AFB's water, is supplied from Bonito Lake (which is in the Pecos River Basin).

2.8 Current and Future Land Use

The land surrounding Holloman AFB consists of residential areas to the east and northeast (city of Alamogordo, New Mexico), rangeland to the south, the White Sands National Monument to the west, and areas where military activities are conducted to the north. The desert terrain of the area immediately surrounding Holloman AFB has limited development, and there are no agricultural operations, residential communities, or large industrial operations located adjacent to the base. The Boles Well Field, a freshwater source for Holloman AFB, is located approximately 6 miles to the southeast of the base. Holloman AFB is an active military installation and is expected to remain active for the foreseeable future. No transfer of military property to the public is anticipated, and public access to the base is restricted. Future land use is not expected to differ significantly from current land use practices (Foster Wheeler Environmental Corporation, 2002).

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2.9 Current and Future Water Use

At present, Holloman AFB receives approximately 50 percent of its freshwater supply from the Boles Well Field. An additional freshwater resource for Holloman AFB, and for the city of Alamogordo, New Mexico, is Bonito Lake, located 60 miles northeast of the Tularosa Basin. Currently, there are no potable supplies of groundwater or surface water located on the base because of poor groundwater quality with TDS concentrations greater than 10,000 mg/L.

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3.0 SOURCE CHARACTERIZATION

This section presents the overall technical approach in general accordance with the *RFI Work Plan* (USACE, 2010) (except where otherwise noted), and details the investigative and remediation activities that were implemented at Building 1175.

The primary environmental media of concern at Building 1175 are soil and groundwater. The extent of contamination in soil was expected to be relatively local to the removed septic tank location. Therefore, the basic approach was to identify the former septic tank location, and then sample at the individual features of the septic tank system in characterizing the soil. To evaluate the potential impacts to groundwater, a monitoring well was installed in the downgradient end of the leach field. The analytical programs for both soil and groundwater focused on the expected nature of contamination likely to be associated with septic tank discharges.

The RFI conducted at the location of the former septic tank OT-C543 at Building 1175 (septic tank removed in 2006) was initiated as part of the Midwestern Region Performance-Based Remediation Contract. The *RFI Work Plan* (USACE, 2010) for this site included the following field work activities: pre-mobilization and mobilization/site setup activities, soil boring advancement, soil sample collection, monitoring well installation and development, groundwater sample collection, sample analysis, investigation-derived waste (IDW) management, and land surveying.

3.1 Pre-mobilization/Mobilization Activities

Several pre-investigation documents were filed and approvals obtained, as follows:

- Civil Engineer Work Request (Air Force Form 332) approval
- Base digging permits (Air Force Form 103, Base Civil Engineering Work Clearance Request) with utility clearances
- Site security clearances
- Facility manager notification of the intended operations.

Prior to the start of activities, a pre-investigation kick-off meeting and site walk-through were conducted with the Air Force Civil Engineer Center resident engineer, Holloman AFB personnel, and Shaw's Construction Manager, to plan for equipment access, equipment staging, decontamination area layout, potential site hazards, emergency evacuation routes, and project schedule.

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Prior to the submittal of the base digging permits, the drilling locations were delineated using marker flags, stakes, and paint. Utility clearance approvals were completed by the appropriate Holloman AFB utility office (i.e., telephone, sewer, water, natural gas, etc.), and by the New Mexico One Call utility clearance system. Upon receipt of the approved digging permit and utility clearances, Shaw's Construction Manager completed a site walk-through to confirm the utility and intrusive work locations. In addition, Shaw performed a site survey prior to the start of drilling activities to search for signs of other buried or overhead utilities.

3.2 Geophysical Investigation

A geophysical investigation was performed at Building 1175 in an attempt to define the limits of the removed septic system. Methods employed included: visual inspection, electromagnetic induction conductivity detection, ground-penetrating radar (GPR), and electromagnetic pipe and cable location.

Electromagnetic induction conductivity detection ground induction methods are employed to detect broad metal mass anomalies or conductive zones that may be indicative of potential septic tanks, and lateral changes in conductive zones of soil or backfill materials relative to native soil. GPR is used to detect abandoned septic tank excavation sidewalls and fill areas. An electromagnetic pipe and cable survey was conducted to detect buried utility lines.

Electromagnetic and GPR surveys were conducted at Building 1175 in June 2012. The location of the removed septic tank and leach field were identified, approximately 75 ft southeast of Building 1175. The locations of the individual leach field piping could not be directly detected by the geophysical survey due to the similarity of composition of the clay pipes and the surrounding soil. However, the leach field could be identified by the geophysical survey equipment due to the differences in mineralization and conductivity between the native soil and the soils that were physically affected by normal leach field operation. The presence of the leach field piping was assumed within the leach field as identified by the geophysical survey which allowed for representative soil and groundwater sample collection. Underground utility locations were delineated to guide the soil boring placement. Geophysical findings are shown on Figure 3-1. The complete geophysical report is included in Appendix B.

3.3 Soil Investigation

The soil investigation of the removed septic tank at Building 1175 was conducted on July 5, 2012. The program consisted of sampling four borings advanced at the removed septic tank location, as shown on Figure 3-1. Soil boring OT-C543-Station 1 (sample numbers OTC543-IS-0001-070512 and OTC543-IS-0002-070512) was placed northwest of the removed septic tank along the influent line, OT-C543-Station 2 (sample numbers OTC543-IS-0003-070512

and OTC543-IS-0004-070512) was placed at the removed septic tank location, OT-C543-Station 3 (samples numbers OTC543-IS-0005-070512 and OTC543-IS-0006-070512) was placed southwest of the removed septic tank near the effluent line, and OT-C543-Station 4 (sample numbers OTC543-IS-0007-070512, OTC543-IS-0008-070512-FD, OTC543-IS-0009-070512, OTC543-IS-0010-070512, and OTC543-IS-0011-070512) was placed in the leach field of the removed septic tank. The borings were advanced using direct push technology (DPT), with soil samples collected at depths of 3 to 5 ft and 10 to 12 ft at OT-C543-Station 1; and 7 to 9 ft and 14 to 16 ft at OT-C543-Station 2; 3 to 5 ft and 10 to 12 ft at OT-C543-Station 3; and 0 to 2, 3 to 5 ft, 10 to 12, and 20 to 22 ft at OT-C543-Station 4 (Appendix C has copies of the sample collection logs). A field duplicate sample was collected from the 10 to 12 ft depth at OT-C543-Station 4.

Soil samples were logged in the field in accordance with the Unified Soil Classification System requirements, and sample depths were in general accordance with the *RFI Work Plan* (USACE, 2010). Soil samples were not screened with a photoionization detector since there was no sensory evidence of contamination. Appendix D contains copies of the soil boring logs.

Soil samples for volatile organic compound (VOC) analysis were collected in accordance with EPA Method 5035, using a TerraCore® Sampler device (EPA, 1986), while non-VOC sample aliquots were placed in laboratory-provided containers. Samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), explosives, polychlorinated biphenyls (PCBs), target analyte list (TAL) metals, total petroleum hydrocarbons (TPH)-gasoline range organics (GRO), TPH-diesel range organics (DRO), TPH-oil range organics (ORO), cyanide, percent solids, and tritium by Accutest Laboratories, Inc., a National Environmental Laboratory Accreditation Program-accredited laboratory, using EPA analytical methods, as summarized on Table 3-1.

The excess sample core soil extracted using the DPT drilling method was placed in 55-gallon drums for later characterization and transport to a licensed disposal facility. The boreholes were abandoned upon completion by plugging from the bottom of the borehole to ground surface using bentonite pellets, then patched with cement to match the surrounding land surface contour. The soil borings were then covered with gravel to match the surrounding land surface contour. Soil boring equipment was decontaminated between borings as detailed in Holloman AFB Standard Operating Procedure 2, “Sampling Equipment Decontamination” which is provided in Appendix B of the *RFI Work Plan* (USACE, 2010) and Shaw’s Standard Operating Procedure No. EI-FS-014, “Decontamination of Contact Sampling Equipment.”

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3.4 Groundwater Investigation

One monitoring well was installed at the Building 1175 septic system site to determine impacts to groundwater. Monitoring well OTC543-MW01 was installed in the leach field, approximately 75 ft southwest of the removed septic tank, as shown on Figure 3-1.

The monitoring well was installed using hollow-stem auger drilling techniques in accordance with NMED Ground Water Quality Bureau *Monitoring Well Construction and Abandonment Guidelines* (NMED, 2011). The 10-inch borehole was advanced through a silty, clayey sand unit into a sand layer at approximately 21 ft bgs to a depth approximately 7 ft into the water table and was completed such that the top of the well screen was set 2 ft below the top of the approximate level of the groundwater observed during drilling. The well screen was set in a position just below the water table level to monitor the water bearing zone in the sand layer below a dry silty, clayey sand unit. The monitoring well was constructed of 2-inch-diameter Schedule-40 polyvinyl chloride riser with 2-inch diameter, Schedule-40 polyvinyl chloride screen fitted with pre-packed, very fine stainless-steel meshing (Appendix E). The screened section of the well was 5 ft long (as opposed to the stipulated 10 ft in the *RFI Work Plan* [USACE, 2010]; the variance is based on observed lithology). A silica sand filter pack was placed around the screen to approximately 3 ft above the top of the screen, with a 2-ft thick bentonite seal placed above the filter pack. The remaining annular space was grouted with cement and bentonite.

The monitoring well was constructed as a "flush-mount" surface completion with a water-tight well vault, locking, expandable well plug, and finished to surrounding grade. Table 3-2 and Appendix E provide monitoring well construction details.

The newly-installed monitoring well was developed to create an effective filter pack around the well screen, remove fine particles from the formation near the borehole, and assist in restoring the natural water quality of the aquifer in the vicinity of the well. Development occurred four days after installation to allow for grout curing. Surging and pumping were both employed to achieve the most effective well development.

Information recorded during well development included water-level measurements, depth-to-bottom measurements, water-quality parameters (pH, temperature, and specific conductance), discharge-water color, water volume, and time period. Well development was performed until the following criteria were met:

- Water removed from the well was visually clear, and the turbidity measures were less than or equal to 10 nephelometric turbidity units. In this case turbidity was reduced two orders of magnitude to below 50 nephelometric turbidity units.

- The pH, temperature, and specific conductance parameters were stabilized (less than 10 percent variation for three successive readings).

Groundwater sampling was conducted at OTC543-MW01 on August 14, 2012 using low-flow sampling techniques. Water quality indicator parameters were measured and recorded during purging of the monitoring wells (Appendix F) using a field-calibrated water quality meter. Table 3-3 contains final water quality readings from the sampling event. Groundwater samples were collected once indicator parameters had stabilized, and analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium by Accutest Laboratories, Inc.

3.5 Investigation-Derived Waste

The nonhazardous IDW that was generated during the Building 1175 RFI were segregated into the following categories:

- Soil – drill cuttings soil
- Water – decontamination liquids and purge water.

Upon generation, IDW was properly containerized and temporarily stored at the designated laydown yard, as specified by Holloman AFB. Wastes were contained in sealed, U.S. Department of Transportation-approved, steel 55-gallon drums (for soil cuttings and decontamination water), roll-off containers with liners and covers (for excavated waste soil), and a 1,400-gallon plastic tank (for waste water). The waste soil drums were emptied into 20-cubic yard roll-off containers, and the wastewater was pumped into a bulk plastic tank prior to characterization sampling and analysis for disposal. The drill cuttings from the Building 1175 Site were placed into the 20-cubic yard roll-off containers along with soils from other Holloman AFB investigation sites.

3.6 Site Surveying

The soil borings and monitoring well locations, along with the septic tank location and associated site features shown on Figure 3-1, were surveyed by Albuquerque Surveying Company, Inc. from Albuquerque, New Mexico, a state-licensed surveyor.

Horizontal coordinates are referenced to the North American Datum 1983 State Plane Coordinate System, New Mexico-Central, and surveyed to an accuracy of $\pm$1.0 ft. Vertical elevations are referenced to the North American Vertical Datum 1988 coordinate system to an accuracy of $\pm$0.01 ft. A copy of the survey results is presented in Appendix G.

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3.7 Decontamination Procedures

A decontamination pad was constructed at the designated laydown area for decontamination of all downhole drilling equipment. The drilling rig was decontaminated prior to entering the site. Drilling equipment that came into contact with the borehole was decontaminated by hot-water pressure washing. Disposable equipment used for soil sample collection did not require decontamination.

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4.0 INVESTIGATION RESULTS AND EVALUATION

Soil analytical results presented in this section were used to delineate constituents of concern that may have been released to the environment, and confirm that no additional remedial measures are required.

4.1 Soil Analytical Results

DPT soil boring samples and post-excavation confirmation samples were collected during the Building 1175 RFI, at the locations shown on Figure 3-1. All soil samples were sent to Accutest Laboratories, Inc., for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium analyses. Analytical results for the soil samples are presented in Table 4-1. Laboratory analytical data packages, and the data validation checklists for the soil sample data, are provided in Appendix H.

The analytical results for metals in Table 4-1 show that Holloman AFB soil samples contain significant amounts of calcium, typically greater than 100,000 milligrams per kilogram (mg/kg) (10 percent), and can be as high as 250,000 mg/kg (25 percent). Calcium at these levels contributes spectral interferences during inductively-coupled plasma metals analysis, and can also clog the nebulizer that is used to introduce the sample. Sample dilution is the recommended method for solving both the spectral interference issue and the nebulizer clogging issue. However, sample dilution raises the analytical method detection limits (MDL) for all associated metals, including thallium.

A typical method detection limit for thallium during inductively-coupled plasma analysis is 0.13 mg/kg. Diluting by a factor of 5 to 20 to eliminate calcium spectral interference and nebulizer clogging causes the thallium detection limit to be elevated by a factor of 5 to 20. This results in a MDL that is above the NMED residential SSL of 0.782 mg/kg thallium. Consequently, the required remedy to allow for proper equipment operation resulted in MDLs that were above the NMED residential SSL. However, thallium is not an element that is anticipated to be present at Building 1175 as a result of normal septic tank operation and maintenance.

The validated soil analytical results were compared with the NMED SSLs (NMED, 2012a), or the EPA RSLs (EPA, 2012a), if NMED residential SSLs have not been established for a given analyte. The soil analytical results were also compared to the NMED-approved Holloman AFB background values (NMED, 2012b). In addition, a TPH screening level of 1,000 mg/kg was used to evaluate the laboratory analytical data. The 1,000 mg/kg action level for petroleum-contaminated soil is the Residential Direct Exposure Limit for unknown

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oil, listed in Table 6-2 (TPH Screening Guidelines for Potable Groundwater) of the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a).

No parameters had detections above the NMED residential SSLs in any of the soil samples collected at Building 1175. Likewise, all soil samples from all locations and depths had TPH-GRO, TPH-DRO, and TPH-ORO concentrations below the TPH screening level.

Antimony was detected in duplicate sample OTC543-IS-0008-070512-FD at a concentration (4.3 mg/kg) that exceeded the Holloman AFB soil background value (1.6 mg/kg), but was below the NMED residential SSL screening criteria (31.3 mg/kg). Antimony was not detected in the sample (OTC543-IS-0009-070512) associated with the field duplicate sample, at a detection limit of 1.1 mg/kg. No other soil detections exceeded the Holloman AFB soil background values.

4.2 Groundwater Analytical Results

One monitoring well (OTC543-MW01) was installed in the leach field during the investigation, as shown on Figure 3-1. Groundwater collected from the well was analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium by Accutest Laboratories, Inc.

The groundwater analytical results were compared to the NMWQCC WQS and EPA drinking water MCLs. Analytical results for the Building 1175 groundwater samples are shown in Table 4-2. All analytical parameter concentrations were below the NMWQCC WQS and EPA drinking water MCLs. The Building 1175 groundwater sample had a TDS value below 10,000 mg/L.

4.3 Investigation-Derived Waste Analytical Results

Waste characterization samples were collected from the bulk waste soil for analysis of Toxicity Characteristic Leaching Procedure VOCs, SVOCs, and RCRA metals. The results are presented in Table 4-3. The results of the waste soil analysis returned no concentrations above 40 Code of Federal Regulations Part 261.24 limits. The waste soil could be managed as nonhazardous waste and was subsequently transported to Otero/Greentree Regional Landfill, Alamogordo, New Mexico for disposal. A copy of the Waste Manifest is provided in Appendix I. The wastewater from equipment decontamination was sampled and analyzed for VOCs, SVOCs, TAL metals, TPH-GRO, TPH-DRO, and TPH-ORO, with the analytical results presented in Table 4-4. The analytical results were reviewed by the Holloman AFB wastewater treatment plant personnel, and subsequently accepted for disposal.

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4.4 Risk-Based Evaluation

4.4.1 Soil

Eleven soil samples were collected at Building 1175, from depths of 0 to 22 ft bgs, during the removed septic tank investigation. Per NMED (2012a), the soil depths of interest for a risk evaluation are 0 to 10 ft bgs for construction workers and residential receptors, and 0 to 1 ft bgs for commercial/industrial workers. Therefore, results from the screening assessment (Table 4-1) that present data for 0 to 10 ft bgs were used for this risk evaluation. Based on the results of the screening evaluation, no constituents of potential concern (COPC) had a concentration greater than NMED residential screening values (or EPA residential RSLs, if NMED values have not been established), or the Holloman AFB soil background values.

Total cancer risk ratios and total hazard ratios (hazard index [HI]) to address potential additive toxicological effects were also assessed (per NMED 2012a, Section 5.0). This was conducted by using maximum detected concentrations of carcinogens and non-carcinogens, estimating risk and hazard ratios, and scaling a total cancer risk and total HI. The total cancer risk did not exceed 1.0×10^{-5} (total cancer risk: 4.6×10^{-6}), as shown in Appendix J. The total HI based on maximum detected concentrations was equal to 0.44 (Appendix J). As the target HI is 1.0, this is acceptable because the HI does not exceed 1.0.

Therefore, as no COPCs were selected for soil, the future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios were not health risks.

4.4.2 Groundwater

One groundwater sample was collected from the Building 1175 monitoring well OTC543-MW01 on August 14, 2012. Based on the results of the screening evaluation (Table 4-2), none of the results had concentrations greater than NMWQCC WQS or EPA drinking water MCLs. Therefore, as no constituents were selected as a COPC for groundwater, the future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not a health risk.

4.4.3 Risk-Based Conclusions

No COPCs were selected in soil or groundwater. Therefore, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not health risks. In addition, total cancer risks and non-cancer hazards in soil were acceptable.

4.5 Ecological Evaluation

The site of the former septic tank at Building 1175 is a relatively flat-lying area that serves as parking and staging in support of the test track buildings. The ground surface is gravel covered and is adjacent to an electrical substation.

A screening-level ecological risk assessment (SLERA) Scoping Assessment Site Assessment Checklist was completed for the Building 1175 (OT-C543) septic tank system and is included in Appendix K. Results of the checklist Exclusion Criteria Decision Tree indicate that the site is a potential viable ecological habitat and a potential exposure pathway exists for soil; therefore, the SLERA should be continued.

Soil data results from 0 to 10 ft bgs were included in the comparison and are provided in Table A of Appendix K. According to NMED (2012c), this is the potential depth of interest for wildlife, including burrowing animals. As shown in Table A in Appendix K, five soil samples were available within the 0 to 10 ft bgs zone. Detected constituents in soil included 16 metals, three VOC, two SVOCs, and petroleum hydrocarbons (both diesel and oil range organics). All other constituents analyzed for were non-detected.

Metals concentrations were compared to Holloman soil background values (Table A, Appendix K). Detected concentrations of metals did not exceed Holloman AFB soil background values in any of the soil samples. Therefore, no further evaluation was performed for metals.

Detected concentrations of ethylbenzene, toluene, xylenes (total), caprolactam, and pyrene in soil data collected at the site were compared to the lowest available ecological screening level (ESL) presented in the Los Alamos National Laboratory (LANL) Eco Risk Database version 3.1 (LANL, 2012). The LANL database provides both No-Effect ESLs and Low-Effect ESLs for soil, and both values are provided in Table A (Appendix K). Each of these organics was detected in only one soil sample, and concentrations were below their respective LANL ESLs, if available, indicating that ecological impacts are not likely to occur from these constituents.

Ethylbenzene and caprolactam were detected in one soil sample each. These organic constituents do not have an ESL available in LANL (2012). Therefore, no comparison could be made, and the potential for ecological impacts from these two organics is uncertain.

Since all detected site concentrations are either below their respective background screening values for metals, or below their respective LANL ESLs, it is concluded that potential risk to the ecological system at the site are generally acceptable. Since there are no ESLs available to compare with site concentrations of ethylbenzene and caprolactam, there is uncertainty

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regarding the potential ecological effects of these two organic constituents. Current methodology does not provide a protocol for assessing the level of uncertainty; however, the uncertainty is likely limited, given that these two organics were detected in just one of five site soil samples.

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5.0 DATA QUALITY ASSURANCE AND DATA QUALITY CONTROL REVIEW

All analytical data was reviewed in accordance with EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA, 2004a) and the EPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (EPA, 2004b). Data qualifiers were added to the database prior to project use. The data tables provided in Section 4.0 show the data qualifiers added during data validation. Detailed data validation checklists for each data deliverable are provided in Appendix H.

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6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary and Conclusions

6.1.1 Soil

Eleven soil samples were collected from various locations during the investigation at former septic tank system for Building 1175. The samples were analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium. Validated analytical results were compared with the NMED residential SSLs (or the EPA RSLs if a NMED SSL was not established for a given analyte), the NMED Residential Direct Exposure Limit for soil contaminated with unknown petroleum oil, and the Holloman AFB soil background values. No samples from the 0 to 10 feet bgs zone had constituent concentrations that exceeded the NMED residential SSLs. In addition, TPH was not detected above 1,000 mg/kg in any of the soil samples from any depth or location. Antimony was detected in one soil sample at a concentration above the Holloman AFB soil background value but below the NMED residential SSL.

Risk-based health screening concluded that there were no COPCs above limits in the soil. The ecological evaluation concluded that potential risks to the ecological system at and surrounding the site are generally acceptable. Ethylbenzene and caprolactam have no established ESLs, therefore, there is uncertainty regarding the potential ecological effects of these two organic constituents. However, the uncertainty is likely limited, given that these two organics were detected in one of five site soil samples

6.1.2 Groundwater

One groundwater sample was collected from the Building 1175 monitoring well OTC543-MW01. The sample was analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium. No parameters had concentrations greater than the NMWQCC WQS or the EPA drinking water MCLs.

Risk-based health screening concluded that no COPCs were identified for groundwater.

6.2 Recommendations

6.2.1 Soil

No COPCs were detected in soil above the NMED residential SSLs and potential risk to the ecological system at and surrounding the site are generally acceptable. Therefore, no additional corrective action is recommended for soil at Building 1175.

6.2.2 Groundwater

No COPCs were detected in groundwater above the NMWQCC WQS or EPA drinking water MCLs. Therefore no corrective action is recommended for groundwater at Building 1175.

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Tables

Table 3-1
Sample Summary
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Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C543-Station1	685551.4241	1671045.8463	7/5/2012	Investigation Soil	3 - 5	OTC543-IS-0001-070512	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/5/2012	Investigation Soil	10 - 12	OTC543-IS-0002-070512	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OT-C543-Station2	685535.3328	1671064.3589	7/5/2012	Investigation Soil	7 - 9	OTC543-IS-0003-070512	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/5/2012	Investigation Soil	14 - 16	OTC543-IS-0004-070512	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C543-Station3	685528.9966	1671029.8949	7/5/2012	Investigation Soil	3 - 5	OTC543-IS-0005-070512	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/5/2012	Investigation Soil	10 - 12	OTC543-IS-0006-070512	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OTC543-MW01 (OT-C543-Station4)	685471.4153	1671011.2233	7/5/2012	Investigation Soil	3 - 5	OTC543-IS-0007-070512	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/5/2012	Investigation Soil - Field Duplicate	10 - 12	OTC543-IS-0008-070512-FD	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OTC543-MW01 (OT-C543-Station4)	685471.4153	1671011.2233	7/5/2012	Investigation Soil	10 - 12	OTC543-IS-0009-070512	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/5/2012	Investigation Soil	0 - 2	OTC543-IS-0010-070512	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/5/2012	Investigation Soil	20 - 22	OTC543-IS-0011-070512	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			8/14/2012	Groundwater	NA	OTC543-GW-5431-081412	TDS	SM2540C
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7470B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

[a] Coordinates are referenced to the North American Datum, 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] EPA, 2007, Test Methods for Evaluating Soil Waste Physical/Chemical Methods, EPA Publication SW-846, Final Update IV. Available online at www.epa.gov/osw/hazard/testmethods/sw846.

Percent Solids and Total Dissolved Solids from *Standard Methods for the Examination of Water and Wastewater*, 19th edition, 1995.

DRO = diesel diesel range organics
EPA = Enviro Environmental Protection Agency
FD = field duplicate
ft bgs = feet below ground surface
GRO = gasoline range organics
GW = groundwater
IS = investigation soil
MW = monitoring well
ORO = oil range organics
PCB = polychlorinated biphenyl
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
SVOC = semivolatile organic compound
TAL = target analyte list
TDS = total dissolved solids
TPH = total petroleum hydrocarbons
VOC = volatile organic compound

Table 3-2
Monitoring Well Construction Details and Groundwater Elevation Data
Building 1175 (OT-C543)
Holloman Air Force Base, New Mexico

Well ID	Monitoring Well Construction Details						Groundwater Elevation Data: 8/14/2012		
	Location Coordinates		Installation Date	Well Diameter (in)	Well Depth at Construction (ft bgs)	Screened Interval (ft bgs)	Top of PVC Riser Pipe Elevation[b] (ft amsl)	Depth to Water (ft below top of PVC riser pipe)	Potentiometric Surface Elevation[b] (ft amsl)
	Grid Northing[a]	Grid Easting[a]							
OTC543-MW01	685471.4153	1671011.2233	7/5/2012	2	28.0	23.0-28.0	4055.13	22.10	4033.03

[a] Location coordinates are referenced to the North American Datum 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] Elevations are referenced to the North American Vertical Datum of 1988 (NAVD 88).

ft = feet
ft amsl = feet above mean sea level
ft bgs = feet below ground surface
ID = identification
in = inches
PVC = polyvinyl chloride

Table 3-3
Monitoring Well Purge Water Quality Parameters
Building 1175 (OT-C543)
Holloman Air Force Base, New Mexico

Well ID	Sample Date	Depth to Water (ft below top of PVC riser pipe)	Total Depth (ft below top of PVC riser pipe)	Purge Water Volume (gallons)	Temperature (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	TDS (g/L)
OTC543-MW01	8/14/2012	22.10	30.7*	2.0	27.50	7.43	6.221	20.7	5.57	52.2	4.051

* Well depth measured during well development.

°C = degrees Celsius
DO = dissolved oxygen
ft = feet
g/L = grams per liter
ID = identification
mg/L = milligrams per liter
mS/cm = millisiemens per centimeter
mV = millivolts
NTU = Nephelometric Turbidity Unit
ORP = oxidation-reduction potential
PVC = polyvinyl chloride
TDS = total dissolved solid

Table 4-1
Soil Analytical Data
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC543-IS-0001-070512		OTC543-IS-0002-070512		OTC543-IS-0003-070512		OTC543-IS-0004-070512		OTC543-IS-0005-070512		OTC543-IS-0006-070512		OTC543-IS-0007-070512		OTC543-IS-0008-070512-FD		OTC543-IS-0009-070512		OTC543-IS-0010-070512		OTC543-IS-0011-070512	
				Sample Date	7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		10 - 12		0 - 2		20 - 22	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**68.4**		**81.5**		**71.9**		**84.8**		**75.2**		**76.4**		**81.7**		**85.5**		**81**		**73.1**		**79.3**	
VOLATILES (mg/kg)																										
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0013	U	0.00097	U	0.0014	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U	0.0017	U	0.074	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0014	U	0.0011	U	0.0016	U	0.0015	U	0.0016	U	0.0016	U	0.0015	U	0.0015	U	0.0016	U	0.0019	U	0.074	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.002	U	0.0015	U	0.0022	U	0.0022	U	0.0022	U	0.0023	U	0.0021	U	0.0021	U	0.0022	U	0.0026	U	0.074	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0013	U	0.00097	U	0.0014	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U	0.0017	U	0.09	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0013	U	0.00097	U	0.0014	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U	0.0017	U	0.081	U
1,1-DICHLOROETHENE	NE	240	449		0.0017	U	0.0012	U	0.0018	U	0.0018	U	0.0018	U	0.0019	U	0.0017	U	0.0018	U	0.0019	U	0.0022	U	0.074	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0014	U	0.0011	U	0.0016	U	0.0015	U	0.0016	U	0.0016	U	0.0015	U	0.0015	U	0.0016	U	0.0019	U	0.074	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0027	U	0.002	U	0.003	U	0.0029	U	0.003	U	0.0031	U	0.0028	U	0.0029	U	0.003	U	0.0036	U	0.074	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.0012	U	0.00088	U	0.0013	U	0.0013	U	0.0013	U	0.0013	U	0.0012	U	0.0013	U	0.0013	U	0.0015	U	0.074	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0013	U	0.00097	U	0.0014	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U	0.0017	U	0.094	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.0012	U	0.00088	U	0.0013	U	0.0013	U	0.0013	U	0.0013	U	0.0012	U	0.0013	U	0.0013	U	0.0015	U	0.074	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0014	U	0.0011	U	0.0016	U	0.0015	U	0.0016	U	0.0016	U	0.0015	U	0.0015	U	0.0016	U	0.0019	U	0.086	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0014	U	0.0011	U	0.0016	UJ	0.0015	U	0.0016	U	0.0016	U	0.0015	U	0.0015	U	0.0016	U	0.0019	U	0.074	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0013	U	0.00097	U	0.0014	UJ	0.0014	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U	0.0017	U	0.074	U
2-HEXANONE	NE	210	NE		0.0064	U	0.0048	U	0.0071	U	0.0069	U	0.007	U	0.0072	U	0.0067	U	0.0068	U	0.0071	U	0.0083	U	0.006	U
ACETONE	NE	61000	66600		0.024	U	0.018	U	0.026	U	0.026	U	0.026	U	0.027	U	0.025	U	0.025	U	0.026	U	0.031	U	0.022	U
BENZENE	NE	1.1	15.4		0.0018	U	0.0013	U	0.002	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.0019	U	0.002	U	0.0023	U	0.0017	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0013	U	0.00097	U	0.0014	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U	0.0017	U	0.0012	U
BROMOFORM	NE	62	616		0.0018	U	0.0013	U	0.002	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.0019	U	0.002	U	0.0023	U	0.0017	U
BROMOMETHANE	NE	7.3	16.5		0.0024	U	0.0018	U	0.0026	U	0.0026	U	0.0026	U	0.0027	U	0.0025	U	0.0025	U	0.0026	U	0.0031	U	0.0022	U
CARBON DISULFIDE	NE	820	1530		0.0024	U	0.0018	U	0.0026	U	0.0026	U	0.0026	U	0.0027	U	0.0025	U	0.0025	U	0.0026	U	0.0031	U	0.0022	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0021	U	0.0016	U	0.0024	U	0.0023	U	0.0023	U	0.0024	U	0.0022	U	0.0023	U	0.0024	U	0.0028	U	0.002	U
CHLOROBENZENE	NE	290	376		0.0012	U	0.00088	U	0.0013	U	0.0013	U	0.0013	U	0.0013	U	0.0012	U	0.0013	U	0.0013	U	0.0015	U	0.0011	U
CHLOROETHANE	NE	15000	29800		0.0024	U	0.0018	U	0.0026	U	0.0026	U	0.0026	U	0.0027	U	0.0025	U	0.0025	U	0.0026	U	0.0031	U	0.0022	U
CHLOROFORM	NE	0.29	5.86		0.0014	U	0.0011	U	0.0016	U	0.0015	U	0.0016	U	0.0016	U	0.0015	U	0.0015	U	0.0016	U	0.0019	U	0.0013	U
CHLOROMETHANE	NE	120	275		0.0024	U	0.0018	U	0.0026	U	0.0026	U	0.0026	U	0.0027	U	0.0025	U	0.0025	U	0.0026	U	0.0031	U	0.0022	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0018	U	0.0013	U	0.002	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.0019	U	0.002	U	0.0023	U	0.0017	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0012	U	0.00088	U	0.0013	U	0.0013	U	0.0013	U	0.0013	U	0.0012	U	0.0013	U	0.0013	U	0.0015	U	0.0011	U
CYCLOHEXANE	NE	7000	NE		0.0017	U	0.0012	U	0.0018	U	0.0018	U	0.0018	U	0.0019	U	0.0017	U	0.0018	U	0.0019	U	0.0022	U	0.0015	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.0012	U	0.00088	U	0.0013	U	0.0013	U	0.0013	U	0.0013	U	0.0012	U	0.0013	U	0.0013	U	0.0015	U	0.0011	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0018	U	0.0013	U	0.002	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.0019	U	0.002	U	0.0023	U	0.0017	U
ETHYLBENZENE	NE	5.4	68.4		**0.005**	J	0.00088	U	0.0013	U	0.0013	U	0.0013	U	0.0013	U	0.0012	U	0.0013	U	0.0013	U	0.0015	U	0.0011	U
ISOPROPYLBENZENE	NE	2100	2430		0.0013	U	0.00097	U	0.0014	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U	0.0017	U	0.0012	U
METHYL ACETATE	NE	78000	78200		0.015	U	**0.0427**		0.016	U	0.016	U	0.016	U	0.017	U	0.015	U	0.016	U	0.017	U	0.019	U	0.014	U
METHYL ETHYL KETONE	NE	28000	37100		0.0072	U	0.0054	U	0.008	U	0.0078	U	0.008	U	0.0081	U	0.0076	U	0.0077	U	0.0081	U	0.0094	U	0.0067	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0065	U	0.0048	U	0.0072	U	0.007	U	0.0072	U	0.0073	U	0.0068	U	0.0069	U	0.0073	U	0.0085	U	0.0061	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0015	U	0.0011	U	0.0017	UJ	0.0017	U	0.0017	U	0.0017	U	0.0016	U	0.0016	U	0.0017	U	0.002	U	0.0014	U
METHYLENE CHLORIDE	NE	56	409		0.0055	U	0.0041	U	0.0061	U	0.0059	U	0.006	U	0.0061	U	0.0057	U	0.0058	U	0.0061	U	0.0071	U	0.0051	U

Table 4-1
Soil Analytical Data
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC543-IS-0001-070512		OTC543-IS-0002-070512		OTC543-IS-0003-070512		OTC543-IS-0004-070512		OTC543-IS-0005-070512		OTC543-IS-0006-070512		OTC543-IS-0007-070512		OTC543-IS-0008-070512-FD		OTC543-IS-0009-070512		OTC543-IS-0010-070512		OTC543-IS-0011-070512	
				Sample Date	7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		10 - 12		0 - 2		20 - 22	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																										
STYRENE	NE	6300	7280		0.0031	U	0.0023	U	0.0034	U	0.0033	U	0.0034	U	0.0035	U	0.0032	U	0.0033	U	0.0034	U	0.004	U	0.0029	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0024	U	0.0018	U	0.0026	U	0.0026	U	0.0026	U	0.0027	U	0.0025	U	0.0025	U	0.0026	U	0.0031	U	0.0022	U
TETRACHLOROETHYLENE	NE	22	7.02		0.0012	U	0.00088	U	0.0013	U	0.0013	U	0.0013	U	0.0013	U	0.0012	U	0.0013	U	0.0013	U	0.0015	U	0.0011	U
TOLUENE	NE	5000	5270		**0.0041**	J	**0.0026**	J	0.0016	U	0.0015	U	0.0016	U	0.0016	U	0.0015	U	0.0015	U	0.0016	U	0.0019	U	0.0013	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0018	U	0.0013	U	0.002	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.0019	U	0.002	U	0.0023	U	0.0017	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0013	U	0.00097	U	0.0014	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U	0.0017	U	0.0012	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0014	U	0.0011	U	0.0016	U	0.0015	U	0.0016	U	0.0016	U	0.0015	U	0.0015	U	0.0016	U	0.0019	U	0.0013	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0024	U	0.0018	U	0.0026	U	0.0026	U	0.0026	U	0.0027	U	0.0025	U	0.0025	U	0.0026	U	0.0031	U	0.0022	U
VINYL CHLORIDE	NE	0.06	0.728		0.0018	U	0.0013	U	0.002	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.0019	U	0.002	U	0.0023	U	0.0017	U
XYLENES, TOTAL	NE	630	814		**0.0252**		0.0028	U	0.0042	UJ	0.0041	U	0.0042	U	0.0043	U	0.004	U	0.004	U	0.0042	U	0.0049	U	0.0035	U
SEMIVOLATILES (mg/kg)																										
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.097	U	0.02	U	0.023	UJ	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	UJ
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
2,4-DICHLOROPHENOL	NE	180	183		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.12	U	0.025	U	0.029	U	0.025	U	0.028	U	0.027	U	0.025	U	0.025	U	0.026	U	0.029	U	0.027	U
2,4-DINITROPHENOL	NE	120	122		1.9	U	0.4	U	0.46	U	0.39	U	0.44	U	0.44	U	0.4	U	0.39	U	0.41	U	0.46	U	0.42	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
2,6-DINITROTOLUENE	NE	61	61.1		0.12	U	0.024	U	0.027	U	0.023	U	0.026	U	0.026	U	0.024	U	0.023	U	0.024	U	0.027	U	0.025	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
2-CHLOROPHENOL	NE	390	391		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
2-METHYLNAPHTHALENE	NE	230	NE		0.097	U	0.02	U	0.023	UJ	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
2-METHYLPHENOL	NE	3100	NE		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
2-NITROANILINE	NE	610	NE		0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
2-NITROPHENOL	NE	NE	NE		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
3-NITROANILINE	NE	NE	NE		0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.39	U	0.081	U	0.092	U	0.078	U	0.088	U	0.087	U	0.08	U	0.078	U	0.082	U	0.092	U	0.085	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
4-CHLOROANILINE	NE	2.4	NE		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
4-NITROANILINE	NE	24	NE		0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
4-NITROPHENOL	NE	NE	NE		0.78	U	0.16	U	0.18	U	0.16	U	0.18	U	0.17	U	0.16	U	0.16	U	0.16	U	0.18	U	0.17	U
ACENAPHTHENE	NE	3400	3440		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
ACENAPHTHYLENE	NE	NE	NE		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
ACETOPHENONE	NE	7800	7820		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
ANTHRACENE	NE	17000	17200		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
ATRAZINE	NE	2.1	NE		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U

Table 4-1
Soil Analytical Data
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC543-IS-0001-070512		OTC543-IS-0002-070512		OTC543-IS-0003-070512		OTC543-IS-0004-070512		OTC543-IS-0005-070512		OTC543-IS-0006-070512		OTC543-IS-0007-070512		OTC543-IS-0008-070512-FD		OTC543-IS-0009-070512		OTC543-IS-0010-070512		OTC543-IS-0011-070512	
				Sample Date	7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		10 - 12		0 - 2		20 - 22	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																										
BENZALDEHYDE	NE	7800	NE	0.97	U	0.2	U	0.23	U	0.19	U	0.22	U	0.22	U	0.2	U	0.19	U	0.21	U	0.23	U	0.21	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
BENZO(A)PYRENE	NE	0.015	0.148	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
BIPHENYL	NE	51	57.1	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.39	U	0.081	U	0.092	U	0.078	U	0.088	U	0.087	U	0.08	U	0.078	U	0.082	U	0.092	U	0.085	U
CAPROLACTAM	NE	31000	NE	0.31	U	0.065	U	0.074	UJ	0.062	U	0.07	U	0.07	U	0.064	U	0.062	U	**0.0665**	J	**0.0875**	J	0.068	U
CARBAZOLE	NE	NE	NE	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
CHRYSENE	NE	15	148	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
DIBENZOFURAN	NE	78	NE	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
DIETHYL PHTHALATE	NE	49000	48900	0.39	U	0.081	U	0.092	U	0.078	U	0.088	U	0.087	U	0.08	U	0.078	U	0.082	U	0.092	U	0.085	U
DIMETHYL PHTHALATE	NE	611000	611000	0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.39	U	0.081	U	0.092	U	0.078	U	0.088	U	0.087	U	0.08	U	0.078	U	0.082	U	0.092	U	0.085	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
FLUORANTHENE	NE	2300	2290	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
FLUORENE	NE	2300	2290	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.43	U	0.089	U	0.1	U	0.086	U	0.097	U	0.096	U	0.088	U	0.086	U	0.091	U	0.1	U	0.093	UJ
HEXACHLOROETHANE	NE	12	42.8	0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
ISOPHORONE	NE	510	5120	0.097	UJ	0.02	UJ	0.023	UJ	0.019	UJ	0.022	UJ	0.022	UJ	0.02	UJ	0.019	UJ	0.021	UJ	0.023	UJ	0.021	UJ
M,P-CRESOL	NE	NE	NE	0.14	U	0.029	U	0.033	U	0.028	U	0.032	U	0.031	U	0.029	U	0.028	U	0.03	U	0.033	U	0.03	U
NAPHTHALENE	NE	3.6	43.0	0.16	U	0.032	U	0.037	U	0.031	U	0.035	U	0.035	U	0.032	U	0.031	U	0.033	U	0.037	U	0.034	U
NITROBENZENE	NE	4.8	53.5	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
PENTACHLOROPHENOL	NE	0.89	8.94	1.2	U	0.24	U	0.28	U	0.23	U	0.26	U	0.26	U	0.24	U	0.23	U	0.25	U	0.28	U	0.25	U
PHENANTHRENE	NE	1830	1830	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
PHENOL	NE	18000	18300	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
PYRENE	NE	1700	1720	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	**0.033**	J	0.021	U

Table 4-1
Soil Analytical Data
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC543-IS-0001-070512		OTC543-IS-0002-070512		OTC543-IS-0003-070512		OTC543-IS-0004-070512		OTC543-IS-0005-070512		OTC543-IS-0006-070512		OTC543-IS-0007-070512		OTC543-IS-0008-070512-FD		OTC543-IS-0009-070512		OTC543-IS-0010-070512		OTC543-IS-0011-070512	
				Sample Date	7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		10 - 12		0 - 2		20 - 22	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																										
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
1,3-DINITROBENZENE	NE	6.10	NE	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
2,4-DINITROTOLUENE	NE	1.60	15.7	0.078	U	0.094	U	0.08	U	0.079	U	0.088	U	0.083	U	0.085	U	0.079	U	0.083	U	0.09	U	0.075	U
2,6-DINITROTOLUENE	NE	61.0	61.1	0.07	U	0.084	U	0.072	U	0.071	U	0.079	U	0.074	U	0.077	U	0.07	U	0.074	U	0.081	U	0.067	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
2-NITROTOLUENE	NE	2.90	29.1	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
3-NITROTOLUENE	NE	6.10	7.82	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
4-NITROTOLUENE	NE	30.0	244.4	0.081	U	0.098	U	0.083	U	0.082	U	0.092	U	0.086	U	0.089	U	0.082	U	0.086	U	0.094	U	0.078	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
NITROBENZENE	NE	4.80	53.5	0.075	U	0.09	U	0.077	U	0.076	U	0.085	U	0.079	U	0.082	U	0.075	U	0.079	U	0.086	U	0.072	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
TETRYL	NE	240.0	244.0	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
METALS (mg/kg)																										
ALUMINUM	13722	77000	78000	**5770**		**1770**		**1180**		**6810**		**5840**		**884**		**3670**		**929**		**1360**		**3240**		**2430**	
ANTIMONY	1.6	31	31.3	1.2	U	0.9	U	1.1	UJ	0.78	U	1.3	U	0.99	U	0.9	U	**4.3**	J	1.1	U	1.2	U	0.91	U
ARSENIC	3.7	0.39	3.90	**1.8**	J	0.9	U	1.1	U	**1.9**	J	1.3	U	0.99	U	0.9	U	0.84	U	1.1	U	1.2	U	0.91	U
BARIUM	169.3	15000	15600	**77.4**	J	**17.2**	J	**18.3**	J	**68.5**	J	**58.2**	J	**17.1**	J	**43.4**	J	**12.7**	J	**16.3**	J	**41.2**	J	**25.9**	J
BERYLLIUM	1.6	160	156	0.6	U	0.45	U	0.55	U	0.39	U	0.63	U	0.5	U	0.45	U	0.42	U	0.55	U	0.59	U	0.46	U
CADMIUM	0.3	70	70.3	0.6	U	0.45	U	0.55	U	0.39	U	0.63	U	0.5	U	0.45	U	0.84	U	0.55	U	0.59	U	0.46	U
CALCIUM	317332	NE	NE	**272000**		**196000**		**251000**		**108000**		**226000**		**246000**		**228000**		**252000**		**248000**		**277000**		**189000**	
CHROMIUM[d]	25	117000	117000	**6.4**		**1.8**	J	**0.95**	J	**6.5**		**5.4**	J	**0.74**	J	**3.2**	J	0.84	U	**1.2**	J	**3.1**	J	**3.1**	J
COBALT	7.7	23	NE	**2**	J	**0.49**	J	**0.56**	J	**2.7**	J	**1.8**	J	0.5	U	**1.2**	J	0.42	U	0.55	U	**1.1**	J	**0.85**	J
COPPER	13	3100	3130	**4.4**	J	0.9	U	1.1	U	**3.1**	J	**3.9**	J	0.99	U	**2.6**	J	0.84	U	1.1	U	**2.9**	J	**1.5**	J
IRON	23049	55000	54800	**5200**		**1660**		**1190**		**7120**		**5270**		**740**		**3300**		**880**		**1230**		**3080**		**2700**	
LEAD	10.9	400	400	**2.8**	J	**0.84**	J	**0.61**	J	**3.5**	J	**2.8**	J	0.5	U	**1.4**	J	0.84	U	**0.57**	J	**2**	J	**1.2**	J
MAGNESIUM	16991	NE	NE	**10900**		**889**	J	**674**	J	**3680**		**11100**		**922**	J	**7200**		**636**	J	**930**	J	**5280**		**2040**	J
MANGANESE	393	1800	1860	**104**		**23.6**		**15.4**		**95.7**		**115**		**14.6**		**75.9**		**12.9**		**15.1**		**79.3**		**28.8**	
MERCURY	0.0108	10	15.6	0.012	U	0.01	U	0.011	U	0.0091	U	0.01	U	0.0098	U	0.0096	U	0.0096	U	0.01	U	0.011	U	0.0099	U
NICKEL	17.4	1500	1560	**4.7**	J	**1**	J	**1**	J	**6.1**	J	**4.2**	J	**0.91**	J	**2.7**	J	**0.56**	J	**0.77**	J	**2.6**	J	**2**	J
POTASSIUM	5077	NE	NE	**1430**	J	**469**	J	**316**	J	**1610**	J	**1430**	J	**258**	J	**1080**	J	**299**	J	**438**	J	**1000**	J	**652**	J
SELENIUM	1.4	390	391	2.4	U	1.8	U	2.2	U	1.6	U	2.5	U	2	U	1.8	U	3.3	U	2.2	U	2.4	U	1.8	U
SILVER	1.1	390	391	0.6	U	0.45	U	0.55	U	0.39	U	0.63	U	0.5	U	0.45	U	0.42	U	0.55	U	0.59	U	0.46	U
SODIUM	5196	NE	NE	660	U	500	U	610	U	430	U	690	U	550	U	**1370**	J	460	U	600	U	**1470**	J	500	U
THALLIUM	1.3	0.78	0.782	1.6	U	1.2	U	1.4	U	1	U	1.6	U	1.3	U	1.2	U	2.2	U	1.4	U	1.5	U	1.2	U
VANADIUM	42.6	390	391	**13.3**	J	**3.1**	J	**2.9**	J	**15.5**	J	**12.1**	J	**2.2**	J	**7**	J	**1.9**	J	**2.8**	J	**6.5**	J	**7.3**	J
ZINC	54.6	23000	23500	**13.9**		**3.8**	J	**3.2**	J	**14.7**		**13.6**		2.5	U	**8.1**	J	4.2	U	2.7	U	**8.7**	J	**6.9**	J

Table 4-1
Soil Analytical Data
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC543-IS-0001-070512		OTC543-IS-0002-070512		OTC543-IS-0003-070512		OTC543-IS-0004-070512		OTC543-IS-0005-070512		OTC543-IS-0006-070512		OTC543-IS-0007-070512		OTC543-IS-0008-070512-FD		OTC543-IS-0009-070512		OTC543-IS-0010-070512		OTC543-IS-0011-070512	
			Sample Date	7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012	
			Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		10 - 12		0 - 2		20 - 22	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																									
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0097	U	0.0082	U	0.0093	U	0.0079	U	0.0088	U	0.0086	U	0.008	U	0.0078	U	0.0082	U	0.0091	U	0.0083	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.012	U	0.01	U	0.012	U	0.0099	U	0.011	U	0.011	U	0.01	U	0.0097	U	0.01	U	0.011	U	0.01	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.012	U	0.01	U	0.012	U	0.0099	U	0.011	U	0.011	U	0.01	U	0.0097	U	0.01	U	0.011	U	0.01	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0097	U	0.0082	U	0.0093	U	0.0079	U	0.0088	U	0.0086	U	0.008	U	0.0078	U	0.0082	U	0.0091	U	0.0083	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0097	U	0.0082	U	0.0093	U	0.0079	U	0.0088	U	0.0086	U	0.008	U	0.0078	U	0.0082	U	0.0091	U	0.0083	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0097	U	0.0082	U	0.0093	U	0.0079	U	0.0088	U	0.0086	U	0.008	U	0.0078	U	0.0082	U	0.0091	U	0.0083	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0097	U	0.0082	U	0.0093	U	0.0079	U	0.0088	U	0.0086	U	0.008	U	0.0078	U	0.0082	U	0.0091	U	0.0083	U
PETROLEUM HYDROCARBONS (mg/kg)																									
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	4.1	U	3.6	U	4	U	4.1	U	4.8	U	4.7	U	5.3	U	4	U	4.4	U	5.2	U	3.2	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	**12.3**		**5.76**	J	4.6	U	3.9	U	4.4	U	**5.38**	J	4.1	U	3.9	U	4.1	U	**23.7**		**13.3**	
OIL RANGE ORGANICS C28-C40	NE	NE	1000	**45.9**		**14.3**		4.6	U	3.9	U	**4.81**	J	**4.69**	J	4.1	U	3.9	U	4.1	U	**23.7**		**10.2**	J
CYANIDE (mg/kg)																									
CYANIDE	NE	22.0	46.9	0.086	U	0.071	U	0.08	U	0.068	U	0.078	U	0.076	U	0.072	U	0.07	U	0.074	U	0.082	U	0.073	U
TRITIUM (pCi/g)																									
TRITIUM	NE	NE	NE	5.89	U	5.99	U	5.64	U	5.63	U	5.89	U	5.57	U	5.84	U	5.24	U	5.69	U	5.77	U	5.71	U

Table 4-1
Soil Analytical Data
Buidling 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," letter to D. Scruggs, Chief, Environmental Restoration Program, Holloman Air Force Base from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, New Mexico Environment Department, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Table 4-2
Groundwater Analytical Data
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC543-GW-5431-081412	
			Sample date	8/14/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NM WQCC WQS (µg/L)[c]	Result	VQ
TOTAL DISSOLVED SOLIDS (mg/L)	NE	NE	10,000	**4120**	
VOLATILES (µg/L)					
1,1,1-TRICHLOROETHANE	NE	200	60	0.2	U
1,1,2,2-TETRACHLOROETHANE	NE	NE	10	0.23	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	NE	NE	0.47	U
1,1,2-TRICHLOROETHANE	NE	5	10	0.22	U
1,1-DICHLOROETHANE	NE	NE	25	0.25	U
1,1-DICHLOROETHENE	NE	7	5	0.23	U
1,2,4-TRICHLOROBENZENE	NE	70	NE	0.5	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.20	NE	0.5	U
1,2-DIBROMOETHANE	NE	0.05	0.10	0.37	U
1,2-DICHLOROBENZENE	NE	600	NE	0.25	U
1,2-DICHLOROETHANE	NE	5	10	0.2	U
1,2-DICHLOROPROPANE	NE	5	NE	0.25	U
1,3-DICHLOROBENZENE	NE	NE	NE	0.2	U
1,4-DICHLOROBENZENE	NE	75	NE	0.23	U
2-HEXANONE	NE	NE	NE	4	UJ
ACETONE	NE	NE	NE	10	UJ
BENZENE	NE	5	10	0.2	U
BROMODICHLOROMETHANE	NE	80	NE	0.2	U
BROMOFORM	NE	80	NE	0.2	U
BROMOMETHANE	NE	NE	NE	0.5	U
CARBON DISULFIDE	NE	NE	NE	0.5	U
CARBON TETRACHLORIDE	NE	5	10	0.25	U
CHLOROBENZENE	NE	100	NE	0.2	U
CHLOROETHANE	NE	NE	NE	0.5	U
CHLOROFORM	NE	80	100	0.22	U

Table 4-2
Groundwater Analytical Data
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC543-GW-5431-081412	
			Sample date	8/14/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NM WQCC WQS (µg/L)[c]	Result	VQ
VOLATILES - continued (µg/L)					
CHLOROMETHANE	NE	NE	NE	0.5	UJ
CIS-1,2-DICHLOROETHYLENE	NE	70	NE	0.26	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	0.2	U
CYCLOHEXANE	NE	NE	NE	0.31	U
DIBROMOCHLOROMETHANE	NE	80	NE	0.2	U
DICHLORODIFLUOROMETHANE	NE	NE	NE	0.5	UJ
ETHYLBENZENE	NE	700	750	0.2	U
ISOPROPYLBENZENE	NE	NE	NE	0.2	U
METHYL ACETATE	NE	NE	NE	5	U
METHYL ETHYL KETONE	NE	NE	NE	2	UJ
METHYL ISOBUTYL KETONE	NE	NE	NE	2	UJ
METHYLCYCLOHEXANE	NE	NE	NE	0.38	U
METHYLENE CHLORIDE	NE	5	100	2	U
STYRENE	NE	100	NE	0.2	U
TERT-BUTYL METHYL ETHER	NE	NE	NE	0.34	U
TETRACHLOROETHYLENE	NE	5	20	0.25	U
TOLUENE	NE	1000	750	0.2	U
TRANS-1,2-DICHLOROETHENE	NE	100	NE	0.35	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.2	U
TRICHLOROETHYLENE	NE	5	100	0.26	U
TRICHLOROFLUOROMETHANE	NE	NE	NE	0.5	UJ
VINYL CHLORIDE	NE	2	1	0.22	U
XYLENES, TOTAL	NE	10000	620	0.52	U

Table 4-2
Groundwater Analytical Data
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC543-GW-5431-081412	
			Sample date	8/14/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NM WQCC WQS (µg/L)[c]	Result	VQ
SEMIVOLATILES (µg/L)					
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	0.52	U
2,4,5-TRICHLOROPHENOL	NE	NE	NE	0.48	U
2,4,6-TRICHLOROPHENOL	NE	NE	NE	0.48	U
2,4-DICHLOROPHENOL	NE	NE	NE	0.48	U
2,4-DIMETHYLPHENOL	NE	NE	NE	1.1	U
2,4-DINITROPHENOL	NE	NE	NE	9.6	U
2,4-DINITROTOLUENE	NE	NE	NE	0.48	U
2,6-DINITROTOLUENE	NE	NE	NE	0.48	U
2-CHLORONAPHTHALENE	NE	NE	30	0.48	U
2-CHLOROPHENOL	NE	NE	NE	0.48	U
2-METHYLNAPHTHALENE	NE	NE	30	0.55	U
2-METHYLPHENOL (O-CRESOL)	NE	NE	NE	0.52	U
2-NITROANILINE	NE	NE	NE	0.48	U
2-NITROPHENOL	NE	NE	NE	0.52	U
3,3'-DICHLOROBENZIDINE	NE	NE	NE	0.96	U
3-NITROANILINE	NE	NE	NE	0.48	U
4,6-DINITRO-2-METHYLPHENOL	NE	NE	NE	1.9	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.48	U
4-CHLORO-3-METHYLPHENOL	NE	NE	NE	0.48	U
4-CHLOROANILINE	NE	NE	NE	0.48	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.48	U
4-NITROANILINE	NE	NE	NE	0.48	U
4-NITROPHENOL	NE	NE	NE	4.8	U
ACENAPHTHENE	NE	NE	30	0.48	U
ACENAPHTHYLENE	NE	NE	30	0.48	U
ACETOPHENONE	NE	NE	NE	0.49	U
ANTHRACENE	NE	NE	30	0.48	U

Table 4-2
Groundwater Analytical Data
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NM WQCC WQS (µg/L)[c]	Sample Number: OTC543-GW-5431-081412	
				Sample date: 8/14/2012	
				Location: MW-01	
				Result	VQ
SEMIVOLATILES - continued (µg/L)					
ATRAZINE	NE	3	NE	0.65	U
BENZALDEHYDE	NE	NE	NE	4.8	UJ
BENZO(A)ANTHRACENE	NE	NE	30	0.48	U
BENZO(A)PYRENE	NE	0.20	0.7	0.48	U
BENZO(B)FLUORANTHENE	NE	NE	30	0.48	U
BENZO(G,H,I)PERYLENE	NE	NE	30	0.48	U
BENZO(K)FLUORANTHENE	NE	NE	30	0.48	U
BENZYL BUTYL PHTHALATE	NE	NE	NE	1.1	U
BIPHENYL	NE	NE	NE	0.48	U
BIS(2-CHLOROETHOXY) METHANE	NE	NE	NE	0.48	U
BIS(2-CHLOROETHYL) ETHER	NE	NE	NE	0.52	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	6	NE	1.1	U
CAPROLACTAM	NE	NE	NE	3.8	U
CARBAZOLE	NE	NE	NE	0.48	U
CHRYSENE	NE	NE	30	0.48	U
DIBENZ(A,H)ANTHRACENE	NE	NE	30	0.5	U
DIBENZOFURAN	NE	NE	NE	0.48	U
DIETHYL PHTHALATE	NE	NE	NE	1.1	U
DIMETHYL PHTHALATE	NE	NE	NE	0.95	U
DI-N-BUTYL PHTHALATE	NE	NE	NE	0.84	U
DI-N-OCTYLPHTHALATE	NE	NE	NE	1.1	U
FLUORANTHENE	NE	NE	30	0.48	U
FLUORENE	NE	NE	30	0.48	U
HEXACHLOROBENZENE	NE	1	NE	0.54	U
HEXACHLOROBUTADIENE	NE	NE	NE	0.96	U
HEXACHLOROCYCLOPENTADIENE	NE	50	NE	1.8	U
HEXACHLOROETHANE	NE	NE	NE	0.96	U

Table 4-2
Groundwater Analytical Data
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC543-GW-5431-081412	
			Sample date	8/14/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NM WQCC WQS (µg/L)[c]	Result	VQ
SEMIVOLATILES - continued (µg/L)					
INDENO(1,2,3-C,D)PYRENE	NE	NE	30	0.48	U
ISOPHORONE	NE	NE	NE	0.48	U
M,P-CRESOL	NE	NE	NE	1.1	U
NAPHTHALENE	NE	NE	30	0.77	U
NITROBENZENE	NE	NE	NE	0.57	U
N-NITROSODI-N-PROPYLAMINE	NE	NE	NE	0.48	U
N-NITROSODIPHENYLAMINE	NE	NE	NE	0.96	U
PENTACHLOROPHENOL	NE	1	NE	5.2	U
PHENANTHRENE	NE	NE	30	0.48	U
PHENOL	NE	NE	NE	0.48	U
PYRENE	NE	NE	30	0.48	U
EXPLOSIVES (µg/L)					
1,3,5-TRINITROBENZENE	NE	NE	NE	0.076	U
1,3-DINITROBENZENE	NE	NE	NE	0.092	U
2,4,6-TRINITROTOLUENE	NE	NE	NE	0.076	U
2,4-DINITROTOLUENE	NE	NE	NE	0.076	U
2,6-DINITROTOLUENE	NE	NE	NE	0.076	U
2-AMINO-4,6-DINITROTOLUENE	NE	NE	NE	0.076	U
2-NITROTOLUENE	NE	NE	NE	0.076	U
3-NITROTOLUENE	NE	NE	NE	0.076	U
4-AMINO-2,6-DINITROTOLUENE	NE	NE	NE	0.078	U
4-NITROTOLUENE	NE	NE	NE	0.076	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	NE	NE	0.076	U
NITROBENZENE	NE	NE	NE	0.08	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	NE	NE	0.076	U
TETRYL	NE	NE	NE	0.076	U

Table 4-2
Groundwater Analytical Data
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC543-GW-5431-081412	
			Sample date	8/14/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NM WQCC WQS (µg/L)[c]**	Result	VQ
METALS (µg/L)					
ALUMINUM	1043	NE	NE	**110**	J
ANTIMONY	6	6	NE	20	U
ARSENIC	10	10	100	**5.7**	J
BARIUM	38	2000	1000	**20.1**	J
BERYLLIUM	4	4	NE	1	U
CADMIUM	5	5	10	10	U
CALCIUM	1,136,664	NE	NE	**653000**	
CHROMIUM, TOTAL	12	100	50	10	U
COBALT	36	NE	NE	1	U
COPPER	9.8	1300	1000	**9.1**	J
IRON	300	NE	1000	**102**	J
LEAD	9	15	50	10	U
MAGNESIUM	3,692,782	NE	NE	**219000**	
MANGANESE	50	NE	200	**48**	
MERCURY	0.5	2	2	0.05	U
NICKEL	22	NE	NE	2	U
POTASSIUM	212,144	NE	NE	**76500**	
SELENIUM	50	50	50	20	U
SILVER	10	NE	50	1	U
SODIUM	20,989,580	NE	NE	**376000**	
THALLIUM	2	2	NE	19	U
VANADIUM	90	NE	NE	**36.9**	J
ZINC	17	NE	10000	50	U

Table 4-2
Groundwater Analytical Data
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NM WQCC WQS (µg/L)[c]	Sample Number: OTC543-GW-5431-081412	
				Sample date: 8/14/2012	
				Location: MW-01	
				Result	VQ
PCBs (mg/kg)					
PCB-1016 (AROCHLOR 1016)	NE	NE	1	0.19	U
PCB-1221 (AROCHLOR 1221)	NE	NE	1	0.24	U
PCB-1232 (AROCHLOR 1232)	NE	NE	1	0.24	U
PCB-1242 (AROCHLOR 1242)	NE	NE	1	0.19	U
PCB-1248 (AROCHLOR 1248)	NE	NE	1	0.19	U
PCB-1254 (AROCHLOR 1254)	NE	NE	1	0.19	U
PCB-1260 (AROCHLOR 1260)	NE	NE	1	0.19	U
PETROLEUM HYDROCARBONS (µg/L) [d]					
GASOLINE RANGE ORGANICS C6-C10	NE	NE	See individual VOC & SVOC	50	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	400	**154**	J
OIL RANGE ORGANICS C28-C40	NE	NE	200	96	U
CYANIDE (µg/L)					
CYANIDE	NE	200	200	5	U
TRITIUM (pCi/L)					
TRITIUM	NE	NE	NE	316	U

Table 4-2
Groundwater Analytical Data
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NM WQCC Water Quality Standard

Value exceeds EPA Maximum Contaminant Level

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," letter to D. Scruggs, Chief, Environmental Restoration Program, Holloman Air Force Base from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, New Mexico Environment Department, March 1.*

[b] *U.S. Environmental Protection Agency (EPA), 2012, National Primary Drinking Water Regulations: List of Drinking Water Contaminants and Maximum Contaminant Levels.*

[c] *New Mexico Water Quality Control Commission, Water Quality Standards, 20.6.2 New Mexico Administrative Code.*

[d]New Mexico Environment Department (NMED), 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, New Mexico Environment Department, Santa Fe, New Mexico, February, Table 6-2. TPH Screening Guidelines for Potable Groundwater (GW-1), February 2012, Table A-1: NMED Soil Screening Levels, updated June 2012. "Unknown oil" criteria used for Oil Range Oraganics.

EPA = U.S. Environmental Protection Agency

GW = groundwater

J = estimated value

MCL = Maximum Contaminant Level

µg/L = micrograms per liter

mg/L = milligrams per liter

NA = not analyzed

NE = not established

NMED = New Mexico Environment Department

NM WQCC= New Mexico Water Quality Control Commission

pCi/L = picocuries per liter

RCRA = Resource Conservation and Recovery Act

RFI = RCRA Facility Investigation

U = not detected at the detection limit shown

VQ = validation qualifier

WQS = Water Quality Standard

Table 4-3
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	LDY-IDW01-090412	
		Sample Date	9/4/2012	
		Sample Type	Waste Characterization	
		40 CFR 261 Waste Characteristic Criteria	Result	Lab Qual
General Chemistry				
Corrosivity as pH	pH Units	> 2 and < 12.5	**7.7**	
Cyanide Reactivity	mg/kg	< 250	1.5	U
Ignitability (Flashpoint)	°F	> 140 °F	>200	
Solids, Percent	%	NA	**84.4**	
Sulfide Reactivity	mg/kg	< 500	59	U
TCLP Volatiles				
Benzene	mg/L	0.5	0.0020	U
Chlorobenzene	mg/L	100	0.0020	U
Chloroform	mg/L	6	0.0022	U
Carbon tetrachloride	mg/L	0.5	0.0025	U
1,1-Dichloroethylene	mg/L	0.7	0.0023	U
1,2-Dichloroethane	mg/L	0.5	0.0020	U
p-Dichlorobenzene	mg/L	7.5	0.0023	U
Methyl ethyl ketone	mg/L	200	0.020	U
Tetrachloroethylene	mg/L	0.7	0.0025	U
Trichloroethylene	mg/L	0.5	0.0026	U
Vinyl chloride	mg/L	0.2	0.0022	U
TCLP Semivolatiles				
2-Methylphenol	mg/L	200	0.0054	U
3&4-Methylphenol	mg/L	200	0.011	U
Pentachlorophenol	mg/L	100	0.054	U
2,4,5-Trichlorophenol	mg/L	400	0.0050	U
2,4,6-Trichlorophenol	mg/L	2	0.0050	U
1,4-Dichlorobenzene	mg/L	7.5	0.0100	U
2,4-Dinitrotoluene	mg/L	0.13	0.0050	U
Hexachlorobenzene	mg/L	0.13	0.0056	U
Hexachlorobutadiene	mg/L	0.5	0.0100	U
Hexachloroethane	mg/L	3	0.010	U
Nitrobenzene	mg/L	2	0.0059	U
Pyridine	mg/L	100	0.016	U
TCLP Metals				
Arsenic	mg/L	5	0.020	U
Barium	mg/L	100	**0.12**	J
Cadmium	mg/L	1	0.010	U
Chromium	mg/L	5	0.010	U
Lead	mg/L	5	0.010	U
Mercury	mg/L	0.2	0.00050	U
Selenium	mg/L	1	0.020	U
Silver	mg/L	5	0.010	U

Table 4-3
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

°F = degrees Fahrenheit
> = greater than
< = less than
% = percent
CFR = Code of Federal Regulations
J = estimated value
Lab Qual = laboratory qualifier
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
NA = not applicable
TCLP = Toxicity Characteristic Leaching Procedure
U = not detected at the detection limit shown

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles				
Acetone	µg/L	NE	10	U
Benzene	µg/L	5	0.21	U
Bromodichloromethane	µg/L	80	0.20	U
Bromoform	µg/L	80	0.34	U
Chlorobenzene	µg/L	100	0.20	U
Chloroethane	µg/L	NE	0.50	U
Chloroform	µg/L	80	0.26	U
Carbon disulfide	µg/L	NE	0.49	U
Carbon tetrachloride	µg/L	5	0.31	U
Cyclohexane	µg/L	NE	0.48	U
1,1-Dichloroethane	µg/L	NE	0.21	U
1,1-Dichloroethylene	µg/L	7	0.20	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.71	U
1,2-Dibromoethane	µg/L	0.05	0.30	U
1,2-Dichloroethane	µg/L	5	0.22	U
1,2-Dichloropropane	µg/L	5	0.26	U
Dibromochloromethane	µg/L	80	0.20	U
Dichlorodifluoromethane	µg/L	NE	0.50	U
cis-1,2-Dichloroethylene	µg/L	70	**0.42**	J
cis-1,3-Dichloropropene	µg/L	NE	0.22	U
m-Dichlorobenzene	µg/L	NE	0.25	U
o-Dichlorobenzene	µg/L	600	0.22	U
p-Dichlorobenzene	µg/L	75	0.20	U
trans-1,2-Dichloroethylene	µg/L	100	0.23	U
trans-1,3-Dichloropropene	µg/L	NE	0.21	U
Ethylbenzene	µg/L	700	0.29	U
Freon 113	µg/L	NE	0.33	U
2-Hexanone	µg/L	NE	2.0	U
Isopropylbenzene	µg/L	NE	0.20	U
4-Methyl-2-pentanone	µg/L	NE	2.3	U
Methyl Acetate	µg/L	NE	5.0	U
Methyl bromide	µg/L	NE	0.79	U
Methyl chloride	µg/L	NE	0.50	U
Methylcyclohexane	µg/L	NE	0.20	U
Methylene chloride	µg/L	5	2.0	U
Methyl ethyl ketone	µg/L	NE	3.1	U
Methyl Tert Butyl Ether	µg/L	NE	0.21	U
Styrene	µg/L	100	0.20	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles (continued)				
1,1,1-Trichloroethane	µg/L	200	0.20	U
1,1,2,2-Tetrachloroethane	µg/L	NE	0.24	U
1,1,2-Trichloroethane	µg/L	5	0.20	U
1,2,4-Trichlorobenzene	µg/L	70	0.50	U
Tetrachloroethylene	µg/L	5	0.32	U
Toluene	µg/L	1000	0.20	U
Trichloroethylene	µg/L	5	0.31	U
Trichlorofluoromethane	µg/L	NE	0.50	U
Vinyl chloride	µg/L	2	0.44	U
Xylene (total)	µg/L	10000	0.50	U
Semivolatiles				
2-Chlorophenol	µg/L	NE	0.68	U
4-Chloro-3-methyl phenol	µg/L	NE	0.78	U
2,4-Dichlorophenol	µg/L	NE	0.67	U
2,4-Dimethylphenol	µg/L	NE	0.74	U
2,4-Dinitrophenol	µg/L	NE	5.0	U
4,6-Dinitro-o-cresol	µg/L	NE	1.4	U
2-Methylphenol	µg/L	NE	0.69	U
3&4-Methylphenol	µg/L	NE	1.3	U
2-Nitrophenol	µg/L	NE	0.65	U
4-Nitrophenol	µg/L	NE	4.8	U
Pentachlorophenol	µg/L	1	4.8	U
Phenol	µg/L	NE	0.53	U
2,4,5-Trichlorophenol	µg/L	NE	0.86	U
2,4,6-Trichlorophenol	µg/L	NE	0.75	U
Acenaphthene	µg/L	NE	0.67	U
Acenaphthylene	µg/L	NE	0.67	U
Acetophenone	µg/L	NE	0.72	U
Anthracene	µg/L	NE	0.72	U
Atrazine	µg/L	3	0.83	U
Benzaldehyde	µg/L	NE	4.8	U
Benzo(a)anthracene	µg/L	NE	0.52	U
Benzo(a)pyrene	µg/L	0.2	0.55	U
Benzo(b)fluoranthene	µg/L	NE	0.73	U
Benzo(g,h,i)perylene	µg/L	NE	0.64	U
Benzo(k)fluoranthene	µg/L	NE	0.64	U
4-Bromophenyl phenyl ether	µg/L	NE	0.76	U
Butyl benzyl phthalate	µg/L	NE	0.68	U
1,1'-Biphenyl	µg/L	NE	0.92	U
2-Chloronaphthalene	µg/L	NE	0.70	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Semivolatiles (continued)				
4-Chloroaniline	µg/L	NE	0.66	U
Caprolactam	µg/L	NE	2.4	U
Carbazole	µg/L	NE	0.50	U
Chrysene	µg/L	NE	0.56	U
bis(2-Chloroethoxy)methane	µg/L	NE	0.67	U
bis(2-Chloroethyl)ether	µg/L	NE	0.69	U
bis(2-Chloroisopropyl)ether	µg/L	NE	0.76	U
4-Chlorophenyl phenyl ether	µg/L	NE	0.84	U
2,4-Dinitrotoluene	µg/L	NE	0.66	U
2,6-Dinitrotoluene	µg/L	NE	0.77	U
3,3'-Dichlorobenzidine	µg/L	NE	0.71	U
Dibenzo(a,h)anthracene	µg/L	NE	0.56	U
Dibenzofuran	µg/L	NE	0.72	U
Di-n-butyl phthalate	µg/L	NE	0.96	U
Di-n-octyl phthalate	µg/L	NE	0.96	U
Diethyl phthalate	µg/L	NE	0.96	U
Dimethyl phthalate	µg/L	NE	0.77	U
bis(2-Ethylhexyl)phthalate	µg/L	6	1.1	U
Fluoranthene	µg/L	NE	0.56	U
Fluorene	µg/L	NE	0.73	U
Hexachlorobenzene	µg/L	1	0.66	U
Hexachlorobutadiene	µg/L	NE	0.92	U
Hexachlorocyclopentadiene	µg/L	50	0.76	U
Hexachloroethane	µg/L	NE	0.71	U
Indeno(1,2,3-cd)pyrene	µg/L	NE	0.55	U
Isophorone	µg/L	NE	0.61	U
2-Methylnaphthalene	µg/L	NE	0.66	U
2-Nitroaniline	µg/L	NE	0.72	U
3-Nitroaniline	µg/L	NE	0.62	U
4-Nitroaniline	µg/L	NE	0.93	U
Naphthalene	µg/L	NE	0.61	U
Nitrobenzene	µg/L	NE	0.69	U
N-Nitroso-di-n-propylamine	µg/L	NE	0.82	U
N-Nitrosodiphenylamine	µg/L	NE	0.96	U
Phenanthrene	µg/L	NE	0.68	U
Pyrene	µg/L	NE	0.65	U
Petroleum Hydrocarbons				
Gasoline Range Organics (C6-C10)	mg/L	NE	0.05	U
Diesel Range Organics (C10-C28)	mg/L	NE	**0.115**	J
Oil Range Organics (C28-C40)	mg/L	NE	0.10	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Metals				
Aluminum	µg/L	NE	**36.2**	J
Antimony	µg/L	6	**6.7**	J
Arsenic	µg/L	10	2.5	U
Barium	µg/L	2000	**29.1**	J
Beryllium	µg/L	4	0.50	U
Cadmium	µg/L	5	1.0	U
Calcium	µg/L	NE	**654,000**	
Chromium	µg/L	100	4	U
Cobalt	µg/L	NE	**6.2**	J
Copper	µg/L	1300	**2.9**	J
Iron	µg/L	NE	**97.5**	J
Lead	µg/L	15	2.2	U
Magnesium	µg/L	NE	**310,000**	
Manganese	µg/L	NE	**179**	
Mercury	µg/L	2	0.03	U
Nickel	µg/L	NE	**3.7**	J
Potassium	µg/L	NE	**16,500**	
Selenium	µg/L	50	4.0	U
Silver	µg/L	NE	0.50	U
Sodium	µg/L	NE	**762,000**	
Thallium	µg/L	2	0.078	U
Vanadium	µg/L	NE	**4.5**	J
Zinc	µg/L	NE	**12.8**	J

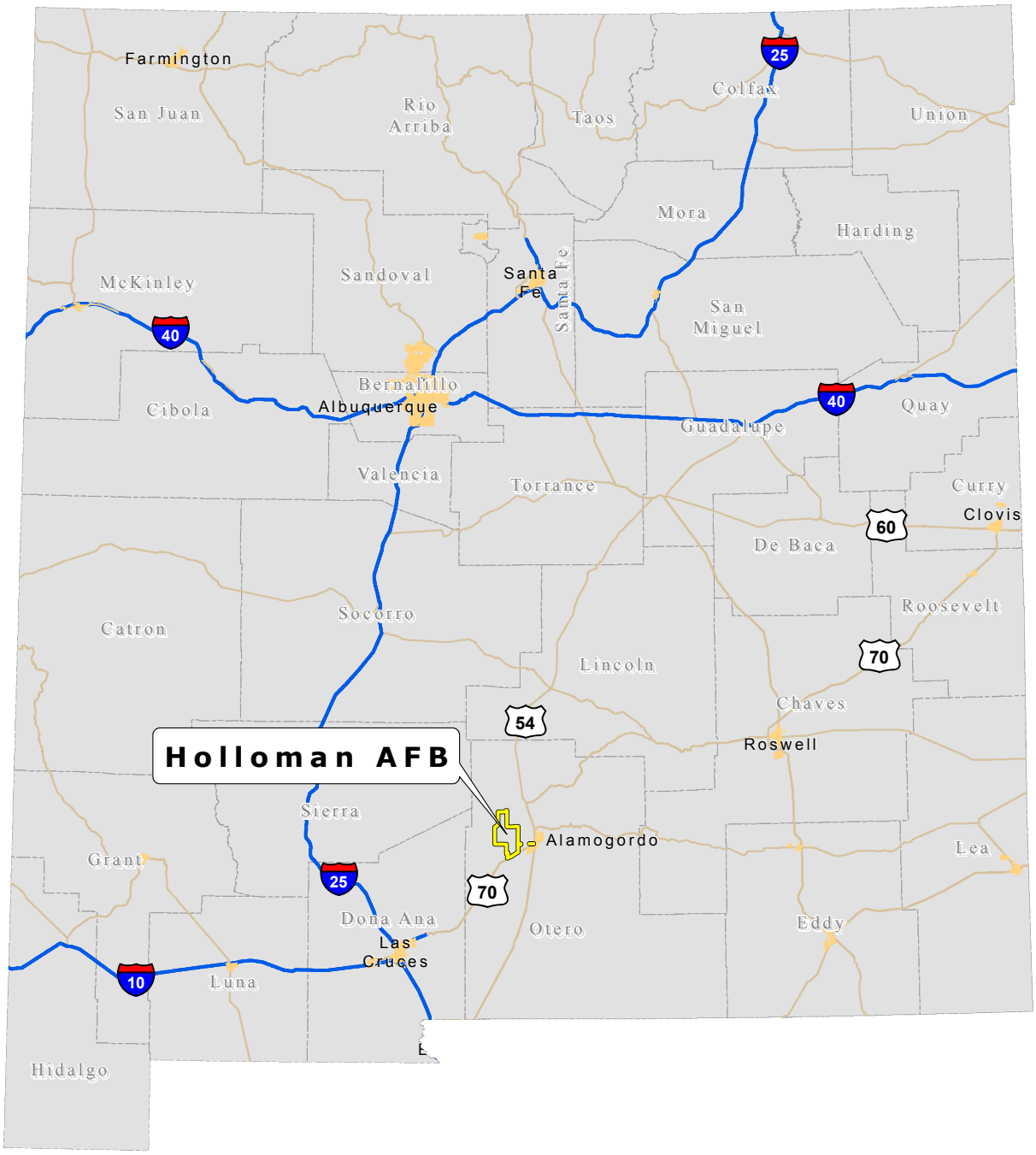
Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

[a] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

EPA = U.S. Environmental Protection Agency
J = estimated value
MCL = maximum contaminant level
µg/L = micrograms per liter
mg/L = milligrams per liter
NE = not established
RSL = regional screening level
U = not detected at the detection limit shown
VQ = validation qualifier

Figures



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Date: 8/28/2013

Approved By: BFoss

Checked By: CLong

Drawn By: BGrod

Office: Hou

Legend

Holloman AFB

N

WGS 84 UTM Zone 13N Meters

0 20 40 80
Kilometers

0 10 20 40
Miles

Figure 1-1

Holloman Air Force Base Location

Holloman AFB, New Mexico

Office	Drawn By	Checked By	Approved By	Date	File Path
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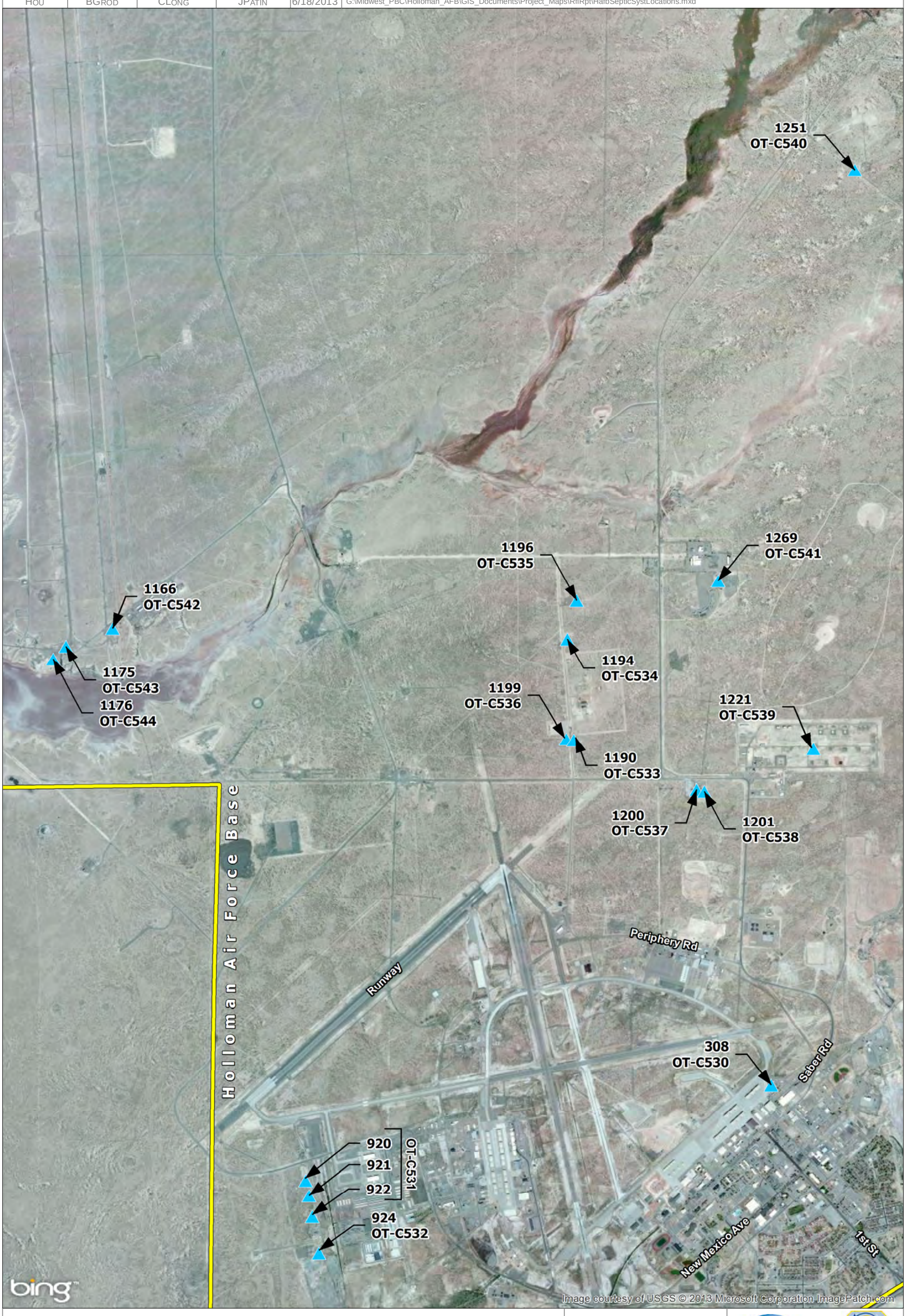


LEGEND

- Holloman AFB
- Septic Tank System

N

WGS 84 UTM Zone 13N
Meters

1 inch = 2,800 feet

0 700 1,400 2,800
Feet

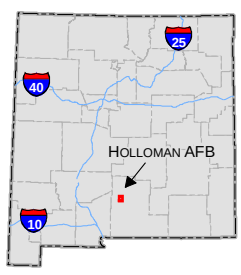
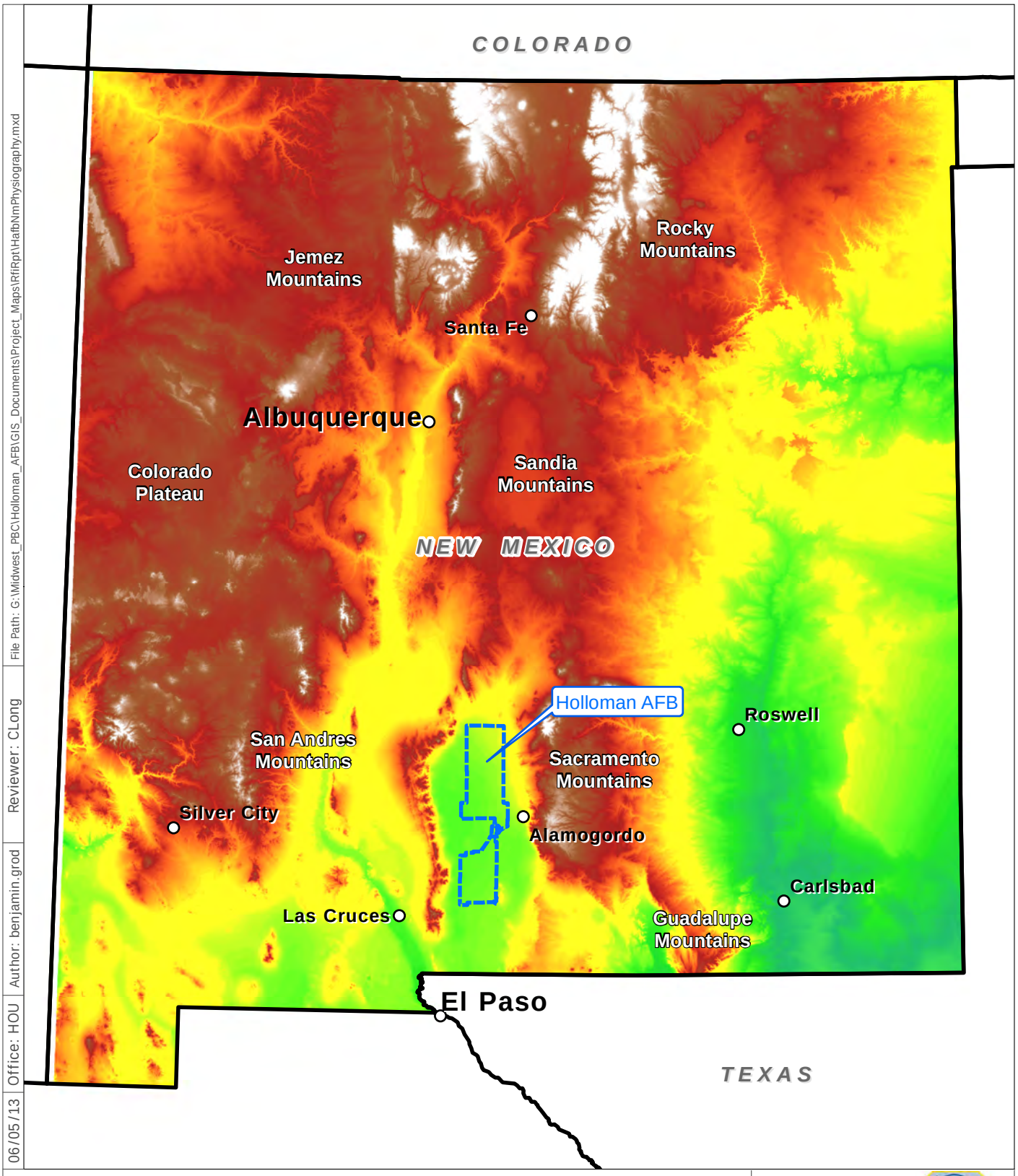


Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
Holloman AFB, NM



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Reviewer: CLong
Author: benjamin.grod
Office: HOU
06/05/13

Legend

Holloman Air Force Base (AFB) Installation Area

Elevation
- High : 3,936 meters
- Low : 0 meters

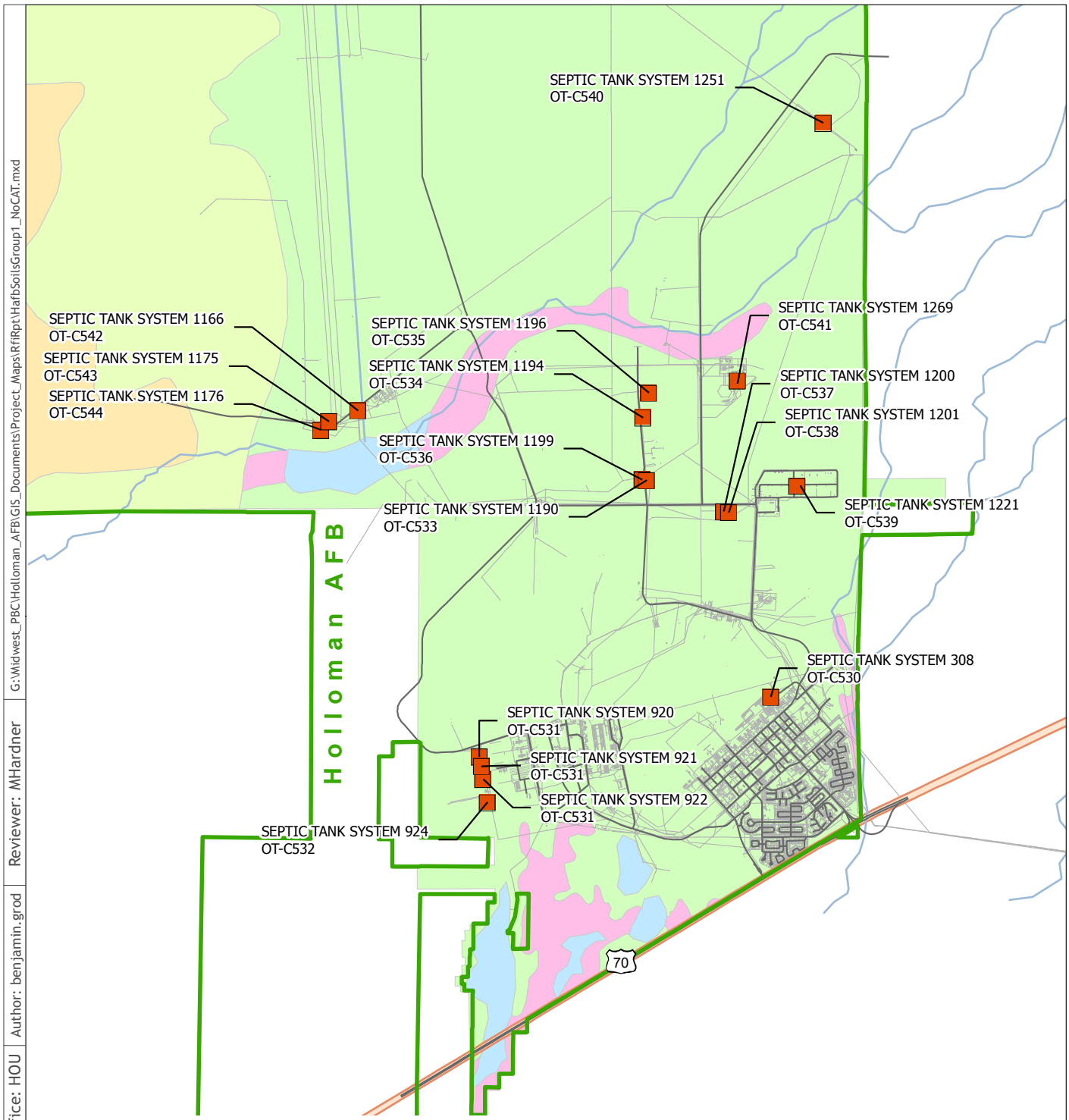
NAD 83 SPCS
New Mexico Central
Feet

0 50
Miles

Figure 2-1

Physiographic Map

Holloman AFB, New Mexico



Note:
1) Soils types at Holloman Air Force Base, New Mexico are based on United States Department of Agriculture (USDA) Soil Conservation Service Classifications. Source USDA, 1981

06/18/13 | Office: HOU | Author: benjamin.grod | Reviewer: MHardner | G:\Widwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbSoilsGroup1_NoCAT.mxd

Legend

- Installation Area
- Group 1 Septic Tank Sites
- Surface Water
- Active Dune Land Gypsum
- Duneland Yesum Association
- Holloman-Gypsum Land-Yesum complex
- Intermittent Water
- Mead Silty Clay Loam
- Rock Land Warm

NAD 83 SPCS
New Mexico Central
Feet

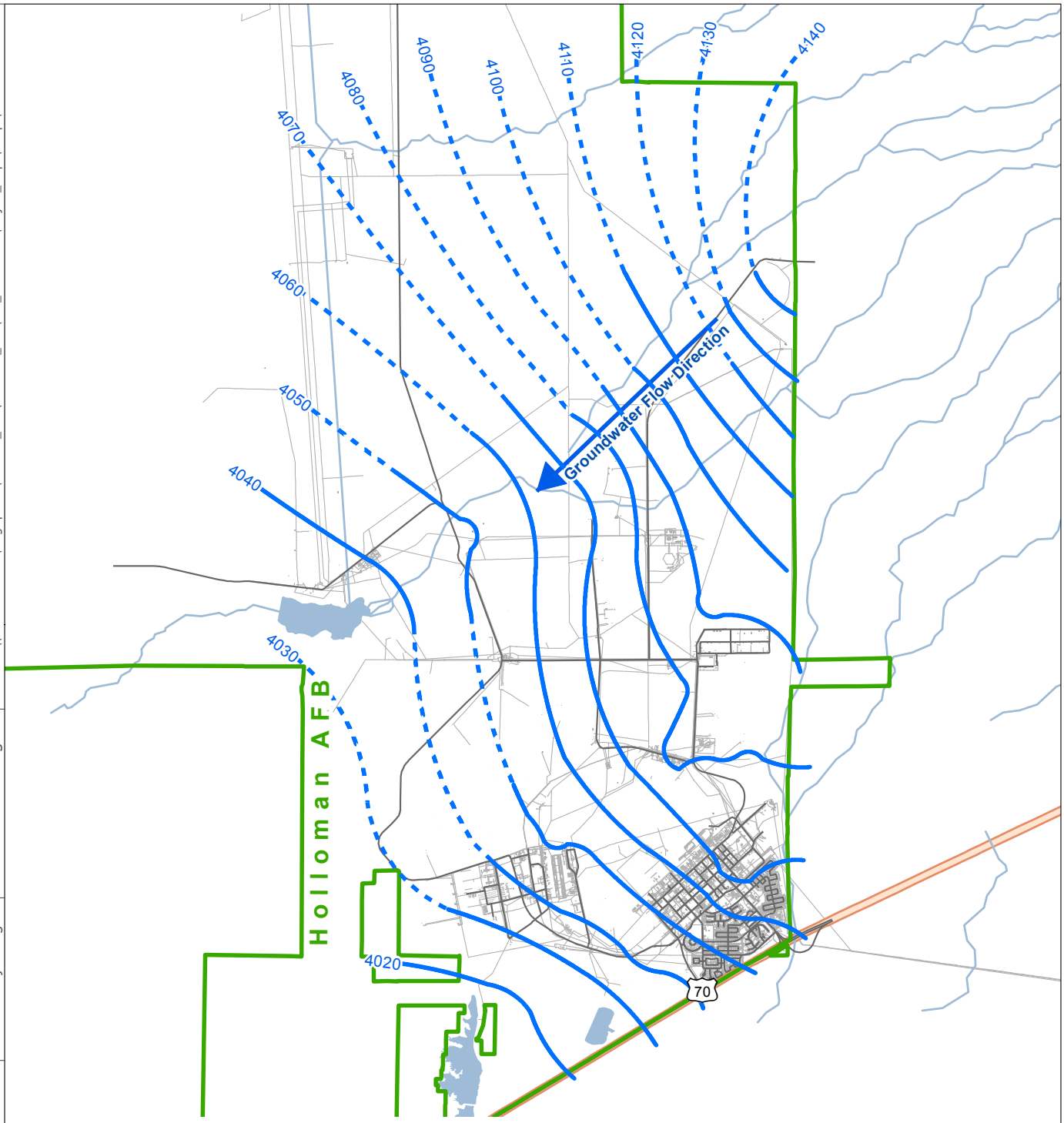
0 7,000
Feet

CBI

Figure 2-2

Septic Systems Soils Map

Holloman AFB, New Mexico



Note:
1) Groundwater contour map showing groundwater elevation contours across Holloman Air Force Base, New Mexico, are based on 2002 measurements taken from the shallow aquifer.
2) Source: Holloman AFB GIS, 2002 LTM.

08/28/13 | Office: HOU | Author: benjamin.grod | Reviewer: CLong | File Path: \\cfsfs01.cfs.com\arcgisprod2\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbGw2002.mxd

Legend

- Installation Area
- Groundwater Flow Direction
- Groundwater Elevation Contour (ft) (Dashed where inferred)
- Surface Water

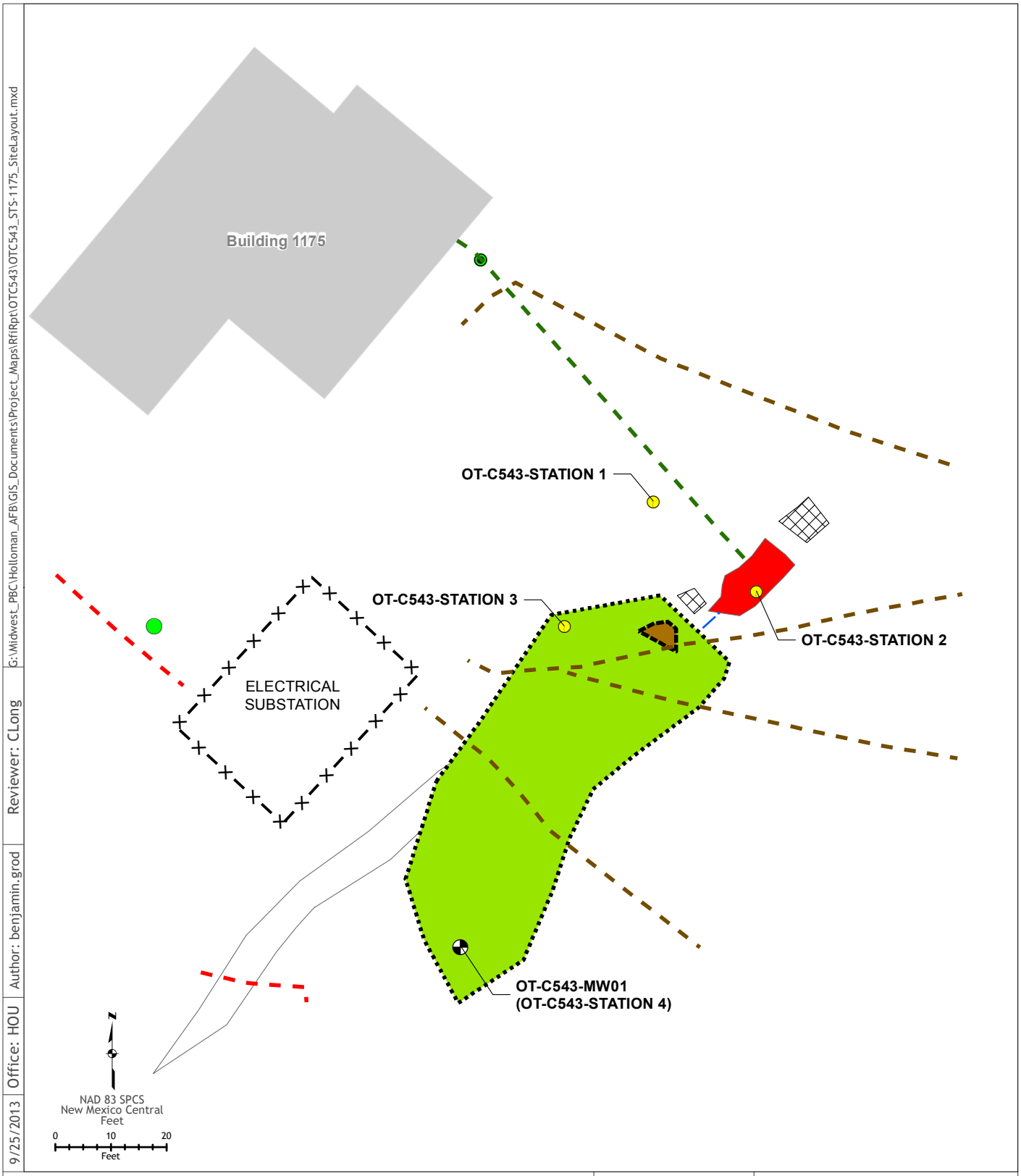
NAD 83 SPCS
New Mexico Central
Feet

0 8,000
Feet

Figure 2-3

Regional Groundwater Contour Map

Holloman AFB, New Mexico



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Reviewer: CLong

Author: benjamin.grod

Office: HOU

9/25/2013

Legend

- Monitoring Well
- Soil Boring Station
- Sewer Cleanout
- Sewer Manhole
- Fence
- Influent Line
- Effluent Line
- Unknown Utility
- Electric Utility
- Hole and Void
- Suspected Leach Field
- Former Septic Tank Location
- MAG Anomaly
- Surface Erosion
- Building

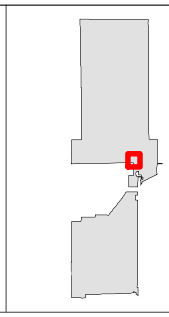


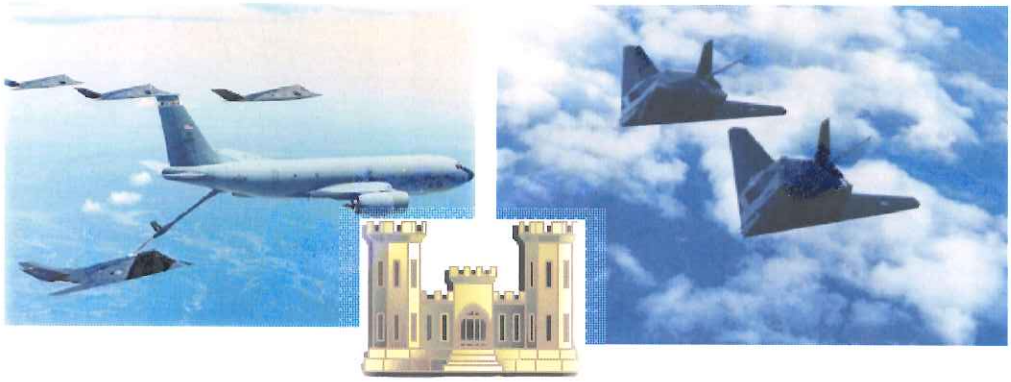
Figure 3-1

Site Layout and
Sampling Locations
Building 1175
Septic Tank System OT-C543

Holloman AFB, New Mexico

Appendix A
Historical Records

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS



Holloman Air Force Base
New Mexico

APRIL 2007

Headquarters, Air Combat Command
Langley Air Force Base, Virginia

49 CES/CEV
Holloman Air Force Base, New Mexico

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH FIGHTER WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

APR 27 2007

MEMORANDUM FOR NEW MEXICO ENVIRONMENT DEPARTMENT
Attn: Mr. James P. Bearzi
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe NM 87505-6303

FROM: 49 CES/CEV
550 Tabosa Ave.
Holloman AFB NM 88330-8458

SUBJECT: Submittal of Information Required by NMED Letter of August 30, 2006
Septic Tanks and Associated Drain Fields, Holloman AFB
EPA ID# NM6572124422

1. Pursuant to Part 4, Condition IV.B.3 of Permit No. NM6572124422, Holloman AFB is submitting the final portion of the required information.

2. This final portion of the required information covers the history of the facilities served by each septic tank and, based on the historic activities that occurred in each facility, the possible wastes that were discharged into the septic systems.

3. If you have any questions or comments, please contact Mr. Dave Griffin or Mr. George Fish at (505) 572-3931.

DEBORAH J. HARTELL
Chief, Environmental Flight

cc: w/Attachments
Mr. Cornelius Amindyas
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

Mr. David Strasser
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS
HISTORY

Holloman's records show a list of fifty seven (57) septic tank systems broken into three categories- Active Septic Systems, Inactive Septic Systems, and Removed Septic Systems. The systems are identified by the Building number they are/were attached to. There are twenty five (25) Active Septic Systems which are listed in this report. There are twenty one (21) Inactive Septic Systems that are listed and the history of activities in the building associated with the system is identified to the extent of available knowledge. There are eleven (11) Removed Septic Systems listed with histories based on available record knowledge.

The Active systems are identified, but no histories of the buildings are provided as this will likely change over time particularly with change in mission (aircraft on base) or tie-in to the base waste water treatment system. A history will be added to this list if and when the septic system is no longer needed and moved to the Inactive or Removed list.

The Inactive systems are scheduled for proper closure per guidance given in the NMED Liquid Waste Regulation 20.7.3.307 NMAC. This regulation calls for capping of the line(s) from the building to the septic tank, pumping out the tanks contents, penetration of the bottom of the tank, along with collapse of the tank roof and filling of the tank with sand or soil.

The septic systems on the Removed list have had the actual septic tank excavated and removed.

A search of Real Property records and the Historic Properties Inventory yielded the information available on the buildings. There was not information available on every building, but if new information becomes available, it will be added to the list.

Attachment 54a-e shows the current plan of where the sewer system lies to show what buildings are currently connected to Holloman's Sewer System. Any building that does not have an active septic tank is either abandoned or connect to Holloman's Sewer System.

ACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	149	1998		1000
2	312	1994		1000
3	375	1968		500
4	882			
5	864 (863)	1994	5'x8'x6'4"	750
6	885	1970	7'10"x4'8"x6'10"	1000
7	886			
8	887	1991		1000
9	923	1959	4'2"x7"x7'9.5"	1600
10	1022	1992		1200
11	1066	1994		1000
12	1160	1957	5'x12'4"x7'6"	1500
13	1161	1957		750
14	1162	1957		350
15	1163	1957		350
16	1169	1962		1680
17	1195	1962		1260
18	1256	1970	12'8"x4'8"x5'	
19	1270			
20	1271			
21	1278	2004		1250
22	1284			
23	1625			
24	75600	1989		1200
25	La Luz Gate (1290)(**1292**)	2004		1250

INACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	308	1965		
2	920	1959	4'2"x7"x7'9.5"	1600
3	921	1959	4'2"x7"x7'9.5"	1600
4	922	1959	4'2"x7"x7'9.5"	1600
5	924	1959	4'2"x7"x7'9.5"	1600
6	1091	1969	6'8"x3'x8'5"	
7	1097	1987	5'10"x5'x7'8"	1672
8	1190	1952	9'x4'x8'10"	3000
9	1194	1987	4'x4'x8'10"	1350
10	1196	1993	4'6"x11'x6'	1300
11	1199	1957		500
12	1200	1954	4'x8'x4'	1000
13	1201	1951	2'6"x6'6"x5'5"	650
14	1219	1985	5'4"x10'6"x8'4"	
15	1221	1983	4'8"x9'4"x6'2"	1100
16	1226	1985	5'6'2"x6'	
17	1235	1986		1189
18	1239	1977	4'6"x8'6"x6'	750
19	1250	1957		350
20	1251			
21	1269	1966	4'6"x9'	500

INACTIVE SEPTIC SYSTEMS

BUILDING 308

This is a 3200 SF building originally constructed in 1965. The original operation in the building was calibration of guided weapons for aircraft. In the 1970s and early 1980s the building was used as a nosedock for F-4 - Test Aircraft Radar electronic work area. It has never had a floor drain.
This facility is currently being used to store air craft support equipment for Building 309. The shop has been used in the past for servicing, inspecting, and repairing AGE equipment, but due to the reduction in personnel, this work is currently only performed in Building 309. The need to expand the work area for AGE equipment maintenance into Building 308 in the near future is not anticipated. A current view of the building is shown below in Figure 1.

Figure 1: Picture of Bldg. 308

Facilities associated with the septic system consist of:

- Toilet
- Lavatory
- Janitorial Sink

The building is located at 340 Delaware Ave. The point of contact for this building is Ms. Vicky Cruz and Mr. Adam Ferrara, they can be reached at 575-~~475~~-5272. The hours

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of operation for this building when it is in use is one 8.5 hr shift (0630-1500) and one 9 hr shift (1500-2400), five days per week.

Industrial Wastewater Drainage: There are no floor or trench drains in this facility. A janitor's sink is located in the restroom. The sanitary sewer pipe from the restroom connects with the pipe from the restrooms in Building in 309. The effluent pipe then proceeds south to Manhole 334E the layout of this facility can be seen below in **Figure 2**. At the time of the inspection surveyors were unable to open Manhole 334E. No cross-connections to the storm sewer were identified.

Industrial Wastewater Sources/Existing Pretreatment/ Existing Management Practices: There is only once source of industrial wastewater from this facility: floor washing

Floor Washing: The floor in this facility is washed every three months using a Tennant floor scrubber, 10 gallons of water and Simple Green. Average and maximum daily wastewater flows from this activity are estimated to be less than one gallon and ten gallons, respectively. The wastewater from this activity is discharged into the French drain at Building 309; therefore, the quantity of wastewater generated by this activity is included in the flow summary for Building 309.

Existing management practices consist of sweeping the floor prior to washing it.

Site Description: Aircraft Corrosion Control
Site Specific Contingency Action Plan: See Attachment 1
Secondary Containment Routes: None
Probable Spill Route: Leaks dissipate in local area on ground
Material Compatibility: No material incompatibilities

Connected to Sewer?

Stored Substances:

Chemical	Container Type
MEK	1 gallon can
Polyurethane Paint	1 gallon can
Naptha	1 gallon can
Toluene	1 gallon can
Epoxy Primer	1 gallon can
PD-680 Type II	55 gallon drum
Waste Paint/Thinners	55 gallon drum

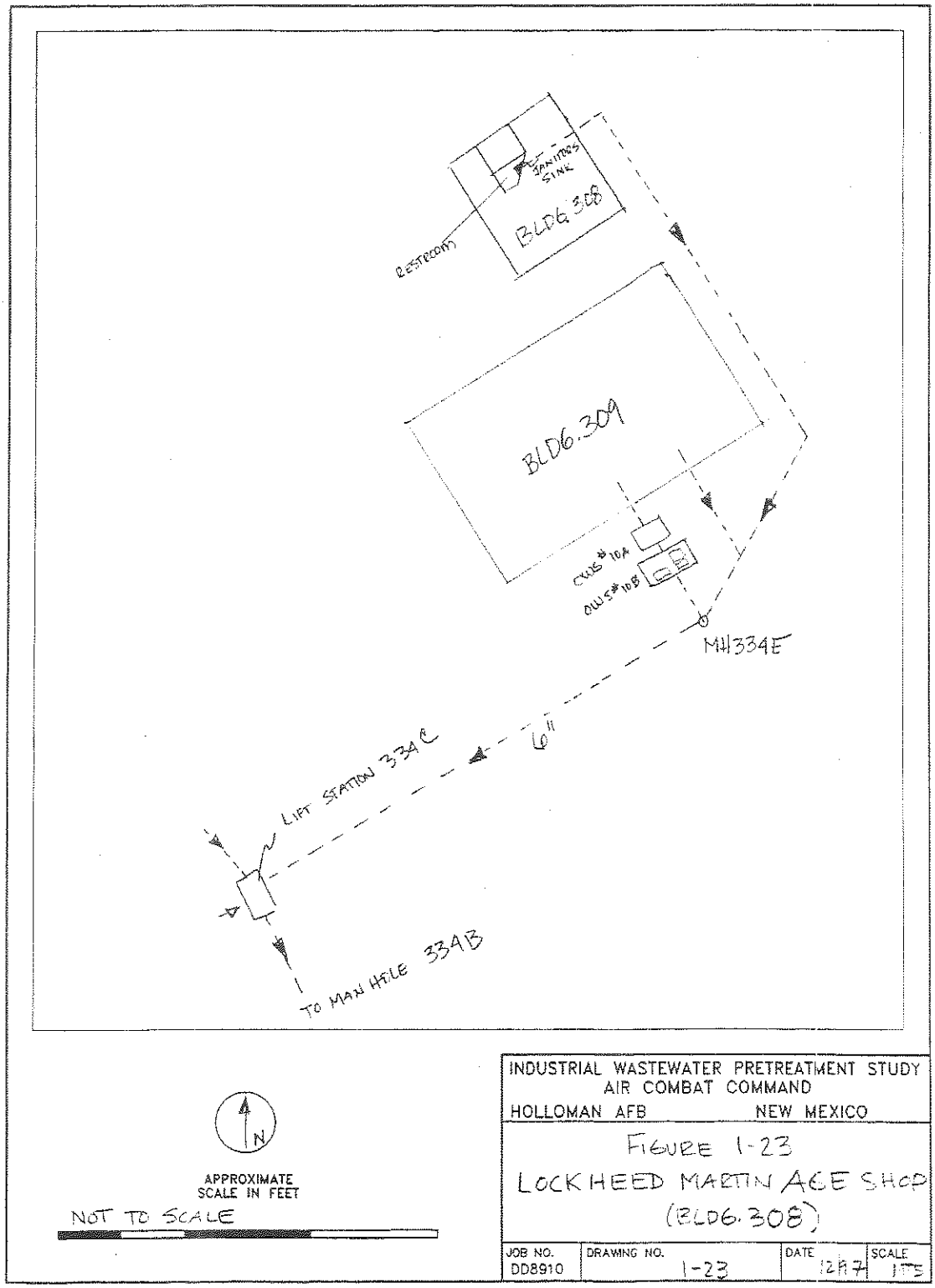

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Figure 2: Layout of Bldg. 308 and 309

INACTIVE SEPTIC SYSTEMS

BUILDINGS 920, 921, 922

These are three identical buildings constructed in 1959. Each building has 1900 SF. They were originally built for ammunition assembly which primarily consisted of bolting rocket components together prior to use. All three buildings are presently vacant and empty.
Each of the three buildings has a simple bathroom consisting of a:

- Toilet
- Lavatory

Multiple inspections were set up for this site, but no one showed up. Therefore, no follow-up information was found. Pictures of the current buildings are shown below in Figures 3-5.

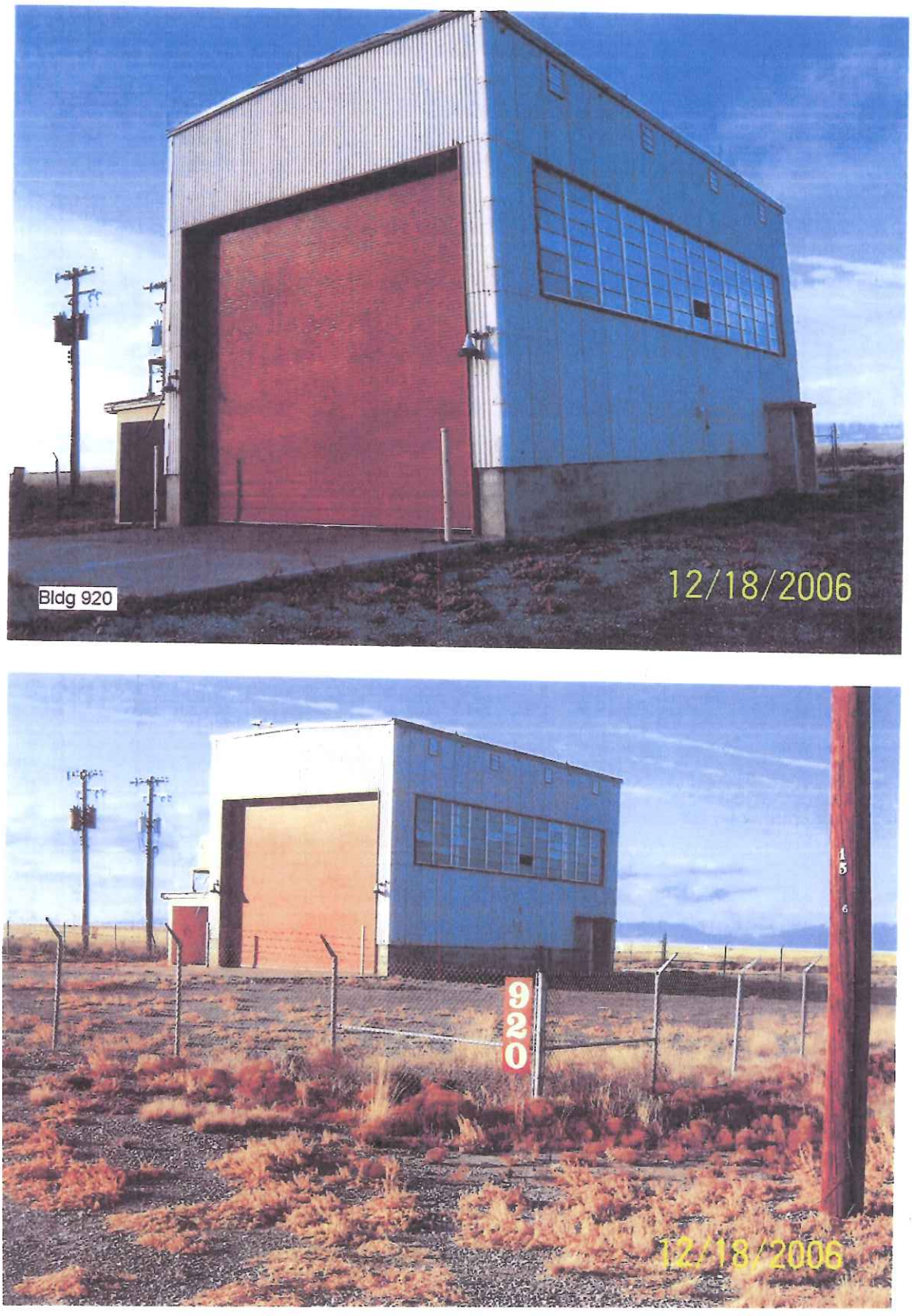


Figure 3: Pictures of Bldg. 920

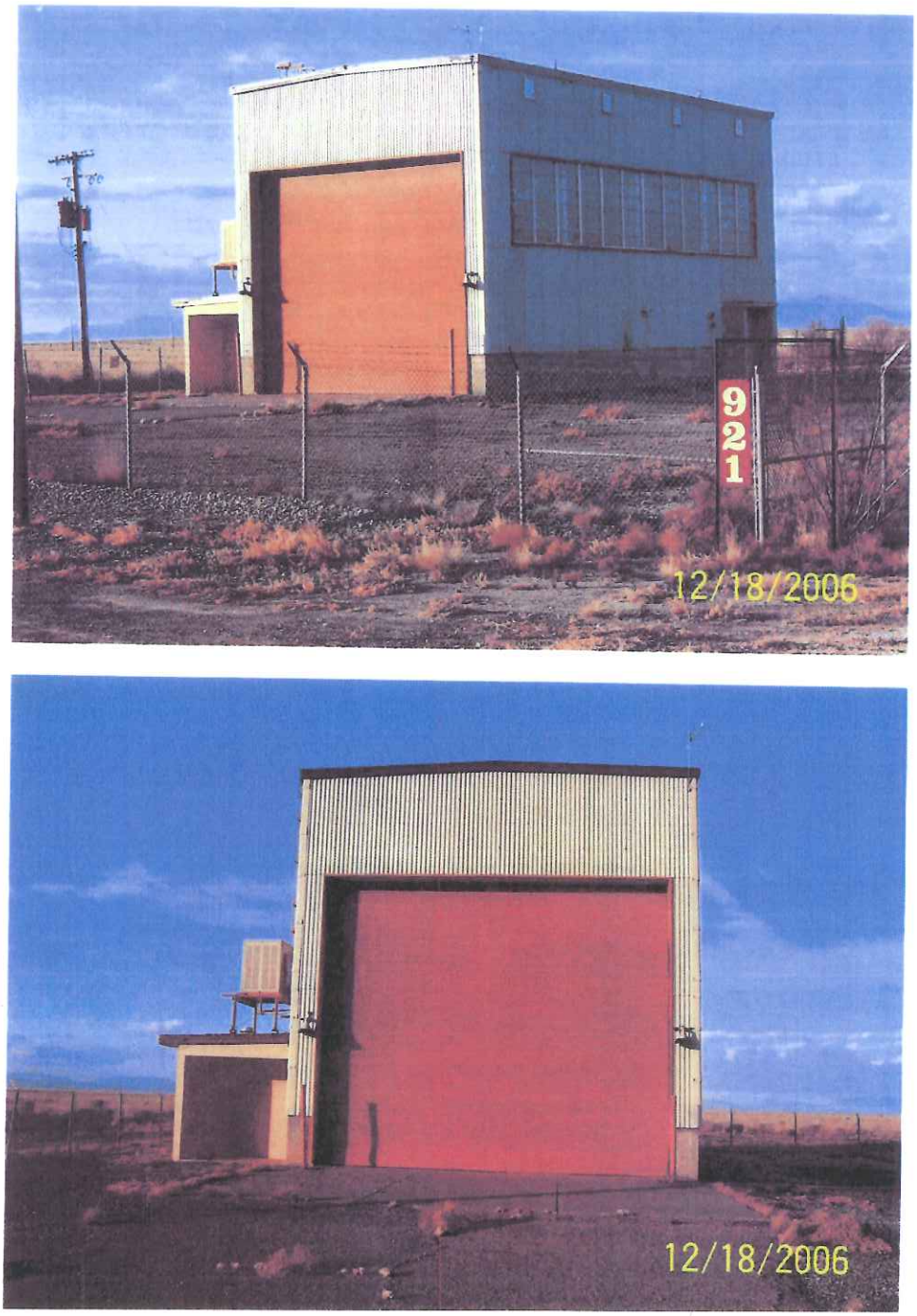


Figure 4: Pictures of Bldg. 921

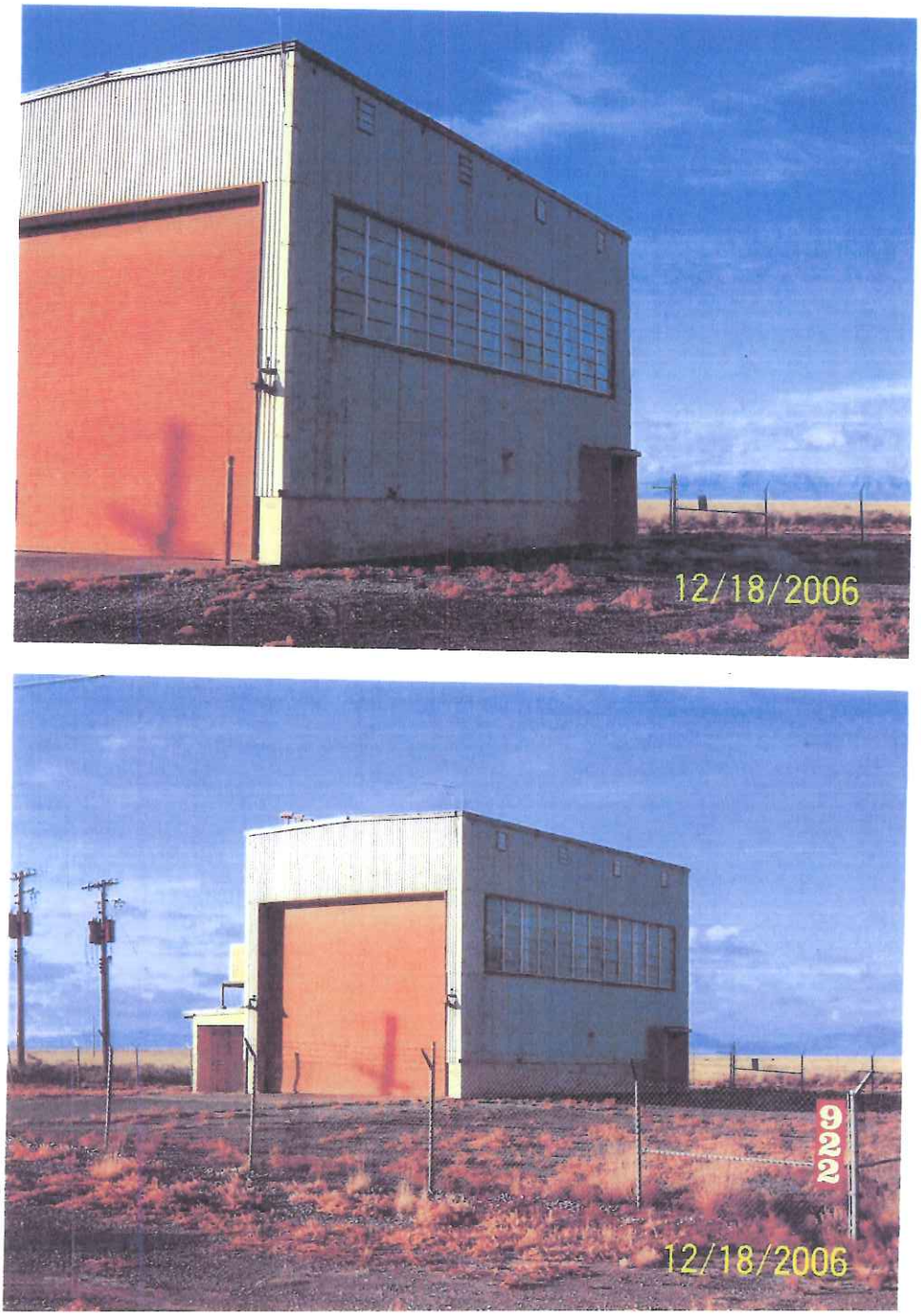


Figure 5: Pictures of Bldg. 922

INACTIVE SEPTIC SYSTEMS

BUILDING 924

This building was constructed in 1959 and has 4800 SF.
The building's original service was ammunition assembly similar to buildings 920-922.
It was later used for maintenance of radar tracking equipment.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

An on site inspection was done for this building on 20 Dec 2007 with the current facility manager, Mr. Michael Tackett. He did not have any information about the history of the septic tank system. Currently the building is being used for munitions storage. For the past two year it has stored rocket motors for the test track. From the on site inspection and drawings (Attachment 4-6) it can be seen that the bathroom drain is separate and there are no floor drains.

There are no pictures on file of this building.

INACTIVE SEPTIC SYSTEMS

BUILDING 1091

Site Description: There are no current files on this building because the building has been demolished. The building served as the Airfield Control Tower until replaced by the present Control Tower
On Attachment 55b a drawing of where the leach field was located in 1984 can be seen.
Grid Coordinates: J.9, 10.2
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: No secondary containment associated with underground storage tank
Probable Spill Route: Leakage from underground tank will contaminate water table in local vicinity

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 / UST

There were also three drawings that were discovered during the research stage of the project. The drawing (Attachment 7) shows the Septic Tank Details, Septic Tank Drain Field and the Drain Field Details.

INACTIVE SEPTIC SYSTEMS

BUILDING 1097

Specifications and history of this building are given in the following "Cold War Survey: Holloman Air Force Base". Along with this survey an on site inspection was done on 28 November 2007 with the current facility managers, A1C Clinton Bennett and TSgt Robert Edyburn. During the on site inspection it was discovered that the bathroom is separated from work area drains. In the past the building was used as a communications work center (office space) until 2005. There are no floor drains in the work area. It is currently being used as a houses base for a radio system network. There were also three drawings (Attachment 8-10) that were discovered in the investigation phase of the project. The drawings show the Materials Septic System, the Septic Tank Placement and Piping, the Latrine Plan, and the Mechanical Plumbing Plan.

Facilities in this building consist of:

- Toilet
- Urinal
- Lavatory

Description: Communications facility
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: None
Probable Spill Route: Leaks dissipate in local area on ground

Tank Location: South of facility
Fuel Flow – South/West

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 /AST
	500 gal each/ 1 /UST (Abandoned)

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Communications, Receiver.
Historic: Transmitter/Receiver.
Street Address: 1432 Sabre Road, HAFB, 88330-7842.

Building Number: 1097

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [ ] Minor [ ] Moderate [x] Major

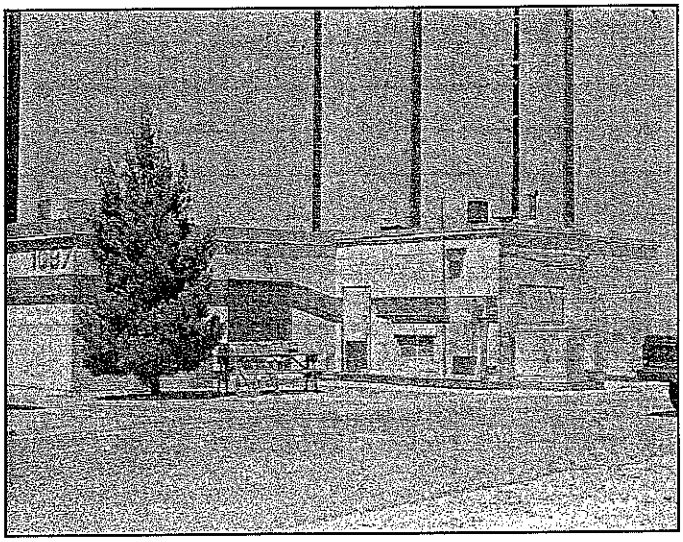
Comments:

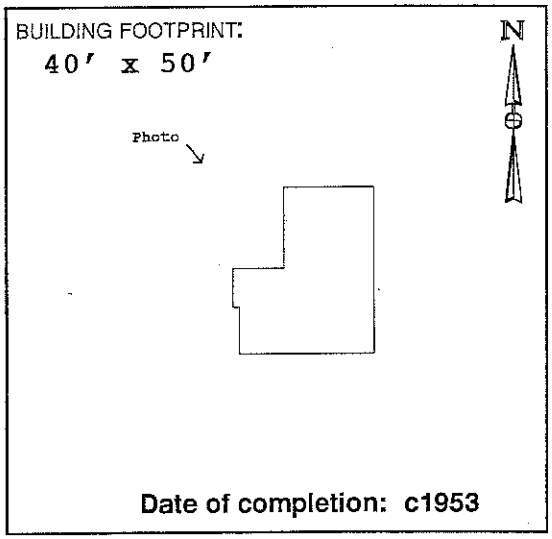
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1097 has not retained historic integrity.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1953

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1097 is a small transmitter building designed with few embellishments for utilitarian use only. Building 1097 originally had a rectangular footprint identical to Building 1098 and Building 1095. The original floor plan was sectioned into 4 rooms. An addition was constructed at the west elevation in 1986 using compatible structural and architectural components (CE File #1097-1). Both the builder and the architect are unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1097.

Current Function: Receiver/Air Traffic Control/Radio Control.

Original Function: Transmitter/Receiving/Communications.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1098-1 (c1952).

Foundation: Concrete wall footing. Concrete slab on granular fill.

Exterior walls: Painted concrete masonary units (CMU).

Roof: BUR on 2" rigid insul.; 2" poured gypsum on gyp board sup. by steel joists.

Notable interior features, including machinery:
Construction drawings document *"UHF Radio Air/Ground Facilities AN/GRC-27"*.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:
Continues to function as a communications facility/receiver site.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1097 has served as a Base communications facility since its completion c1953. Several renovations have resulted in a loss of historic integrity for this building. Building 1097 is no longer eligible for the National Register of Historic Places.

VII. ASSOCIATED BUILDINGS:

Location plan CE File #1098-2 identifies at least three north area transmitter sites. Building 1097 was associated with transmitter Building 1098. This facility is also associated with the flightline, and with communications Building 221.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building #1097 retains its original function as a radio receiver facility, however it has been modified to accommodate electrical, mechanical, and equipment additions and change-outs. Original equipment has been replaced.

Office space was added to the south elevation (1986: CE File #1097-1). All six windows at the north, east and west elevations have been blocked in. Original doors have been replaced. Vinyl floor tile covers original tile throughout. Dropped ceilings have been added.

This building, although retaining historic significance as a receiving site, has lost integrity of design, materials, workmanship, and association with its period of significance. Note: A Sgt. Boots (extension 3132) was identified by Building 1097 personnel as being a possible source for oral history research concerning specific activities associated with this facility.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Office space added to the west elevation (c1986: CE File #1097-1).

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Construction of adjacent buildings has altered viewshed.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Windows have been blocked in.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: An addition obscures the original west elevation. The original window treatments removed. Dropped ceilings added. Original asphalt floor tile covered.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: The presence of interior communications equipment and exterior poles contribute to the integrity of feeling as a radio site.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

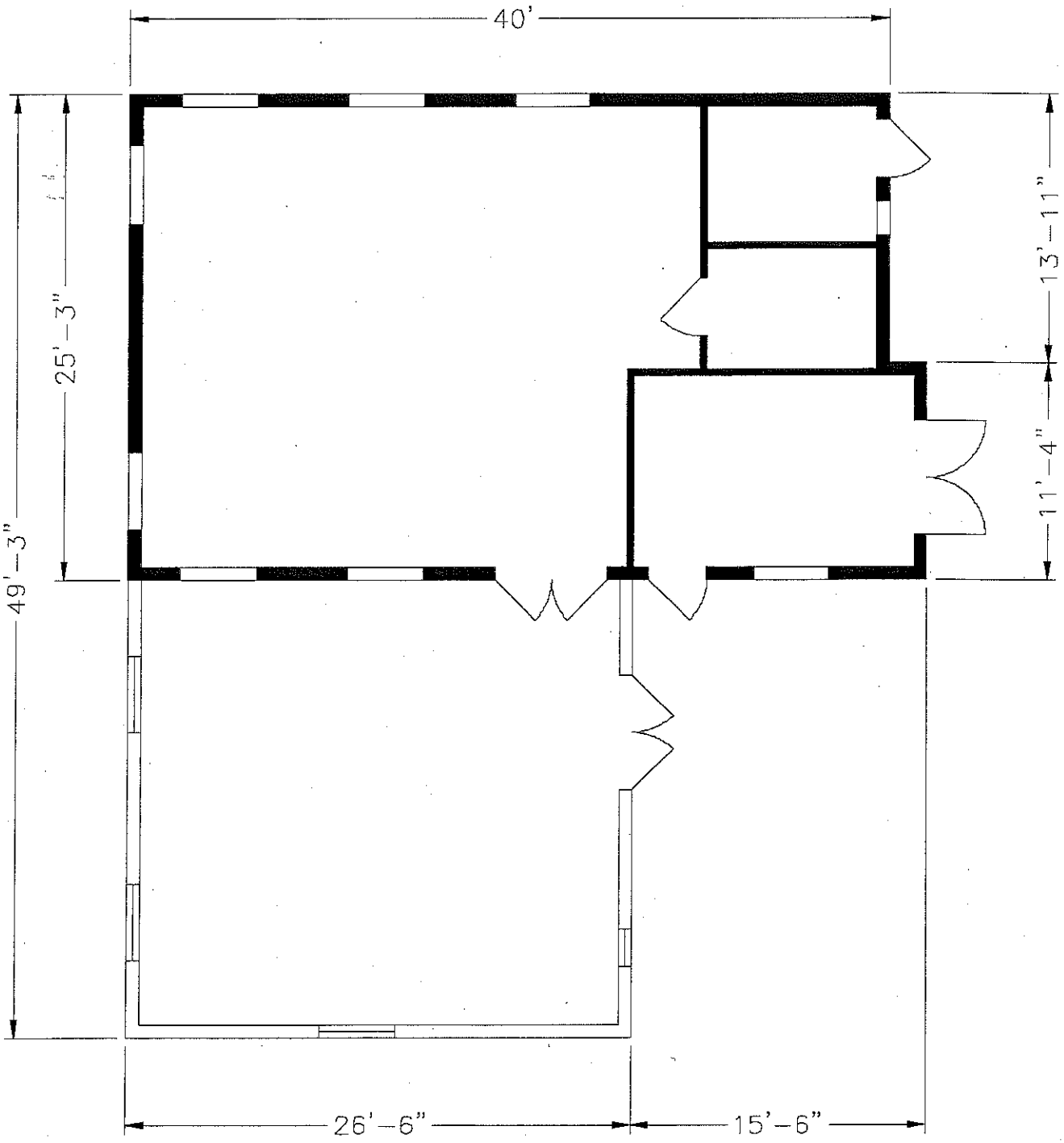
Comments: Original equipment has all been replaced.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #81**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



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Source: CE File #1098-2 (c1971)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1097** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1190

This building was constructed in 1952 and demolished in 2002. Specifications and history are provided in the "Cold War Survey".

The only drawing discovered was the plumbing floor plan and it can be seen in Attachment 11. Attachment 55d shows the current location of the leach field in 1984.

2002 Demolished Due To Unrelated Condition

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Security Police Building.
Historic: Change House/Unconventional Fuel Storage.
Street Address: 1514 Lethal Road, HAFB, 88330-7840.

Building Number: 1190

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1190 is in need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

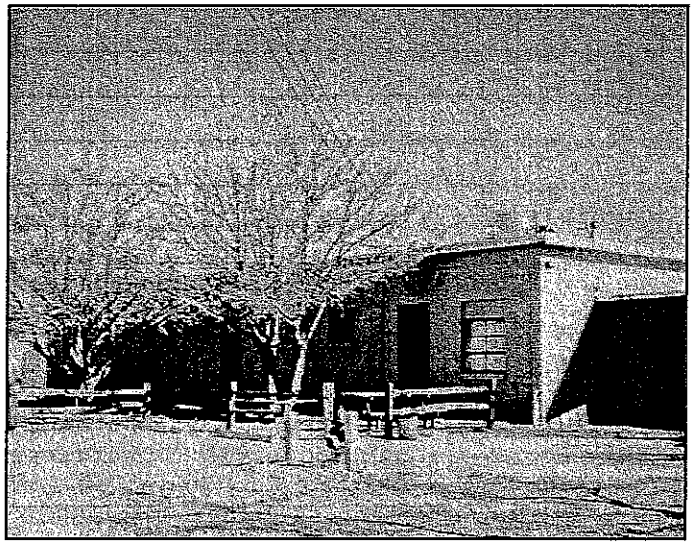
Comments: Interior partitions have been removed (date unknown).

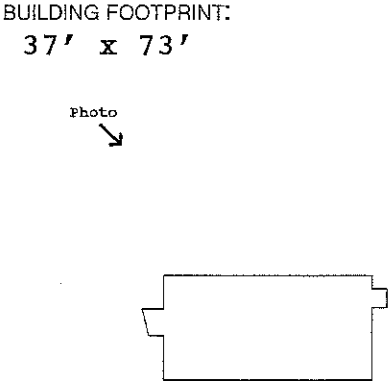
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1190 is a single-story, flat-roofed, concrete masonry unit (CMU) building exhibiting large roll-up equipment doors, numerous personnel access doors, and asymmetrical window fenestration. Construction drawings prepared in 1951 were stamped "As-built" but were not stamped in the revision block. Real Property Accountable Record/1190 indicates that Building 1190 was completed c1952 as a Change House for unconventional fuels personnel. W. C. Kruger Company (Santa Fe, NM) provided the construction drawings stored in CE File #1190. The builder is not known. A comparison of the current building and original blueprints reveals that no structural modifications to the building have occurred.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1190; CE File 1195-1 (c1951).

Current Function: Security Police operations.

Original Function: Change House, Unconventional Fuels.

Interim Functions: "RC Con House" (n.d.); "Prpln R-L Fuel/Lub" (n.d.); Prop Res Lab Rocket" (n.d.); "Prpln R-L Rkt" (n.d.); Sp Operations (n.d.).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1190-1 (c1951).

Foundation: Poured concrete footings and grade beams; concrete slab.

Exterior walls: Concrete masonry units (CMU).

Roof: (Built-up) gravel on rigid insul.; 2" slab sup. by metal lath and steel joists.

Notable interior features, including machinery: Shower stalls, locker room, dressing room, and laboratories.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

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VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Recommend reassessment of Building 1190 once the fifty-year construction date is met in the year 2002. This building retains historic integrity.

VII. ASSOCIATED BUILDINGS:

According to CE File #1190-1 *Title Sheet*, Unconventional Fuels Storage Building 1190 was associated with Building 1194 (Booster Inspection), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

This building retains all aspects of historic integrity. Although not meeting the "exceptional importance" standard imposed on buildings constructed within the last fifty years, Building 1190 remains potentially eligible as an individual property once the fifty-year date of construction is met in the year 2002. Recommend inclusion in a Multiple Property nomination along with the other unconventional fuels storage buildings. Building 1190 is currently being used as a storage and administrative facility by the 49th Squadron Security Police personnel. The original shower stalls, dressing room, locker room, shop, tools and supply rooms are all used for storage. Free-standing shelves have been installed to accommodate storage. As a result, some original doors and windows are blocked from view. Minor alterations have occurred at the interior. Two partitions have been removed. Glazed tile walls appear to have been added to at least one office. Vinyl tile has been installed over one section of the concrete slab in what once served as a machine shop. Some of the window panes have been painted. Because this facility remains potentially eligible, recommend that the original design features be considered in future modifications, and that photographs document any changes to the essential features. Suggested routine maintenance: Prune trees away from principal facade. Noticeable water damage warrants inspection of the roof. Replace broken window panes. Repair hole at exterior south elevation wall.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: Interior room layout as a Change House remains a key design element. This layout includes large open interior spaces, smaller labs/offices, and showers, dressing, and locker rooms used by unconventional fuels personnel.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Although no longer used as such, Building 1190 continues to be situated in the vicinity of other buildings historically associated with unconventional fuels testing and storage. This building appears to been recently landscaped.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two interior partitions removed. Glazed tile walls in office rather than CMU shown on original drawings.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Nearly all original workmanship remains visible, particularly at exterior.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Aside from the change in operations occurring here, Building 1190 remains essentially as it was originally constructed.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

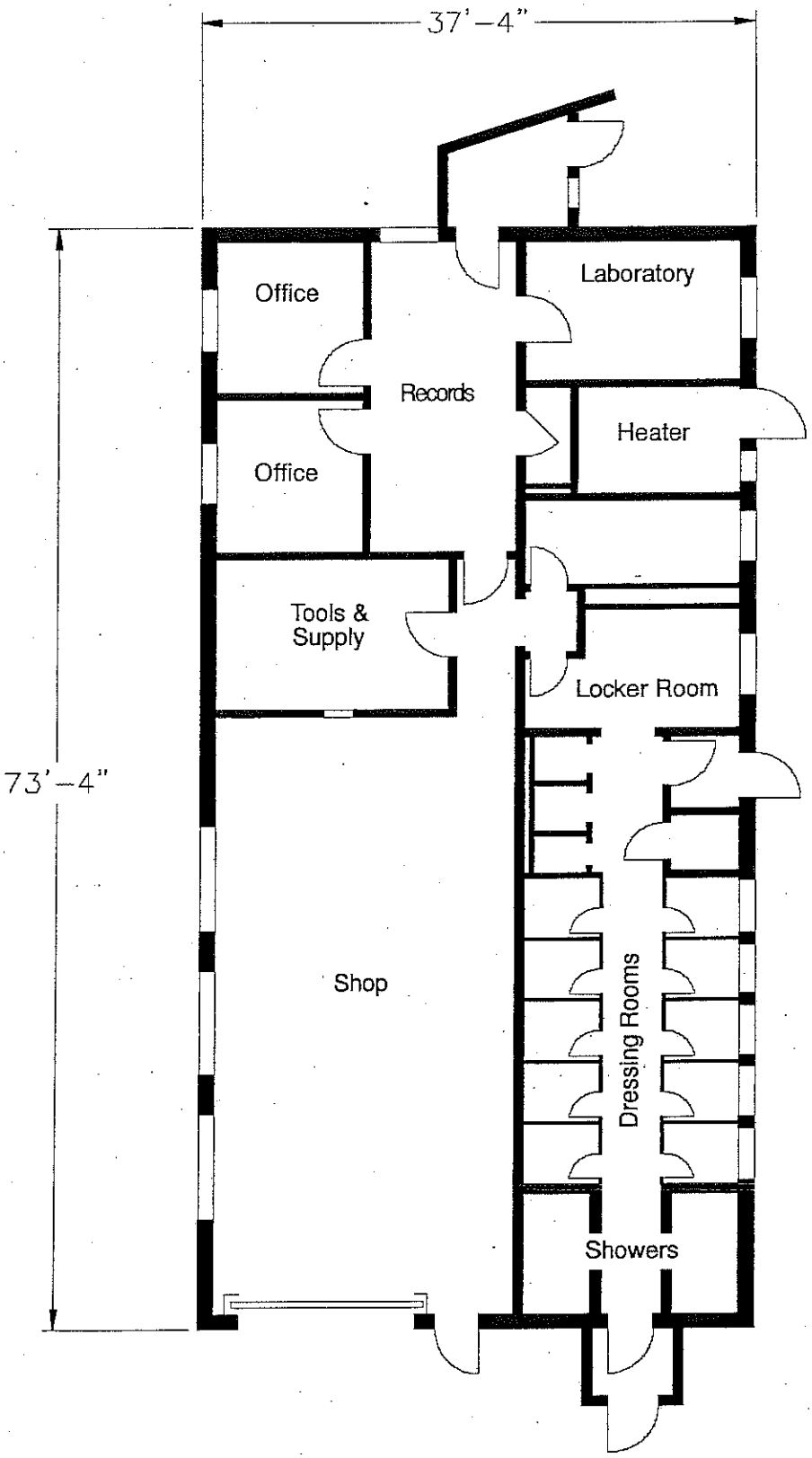
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #-Photo #**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1190-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1190** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Mike Gardner* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1194

Specifications and history are given in the "Cold War Survey".
Facilities in this building consist of:

- Toilet
- Lavatory

An on site inspection was done on 7 Jan 08 with the current facility manager, SSgt Joshua Roberts. In the inspection it was noted that the bathroom is separated from the work area drain. There was no history known. The building is currently being used for storage and it has been used for storage and has been used for storage for the past ten years.
Attachment 55d shows where the leach field for Bldg.1194 was located in 1984.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME: **Building Number:**

Current: Research Equipment Storage.

Historic: Booster Inspection/Unconventional Fuel.

Street Address: 1584 Lethal Rd., HAFB, 88330-7840. **1194**

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1194 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

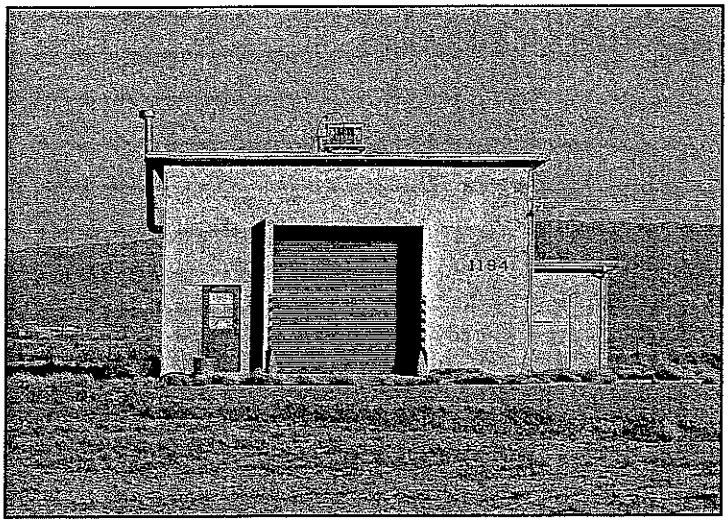
Comments: Interior partitioning is reversible.

Preliminary Determination of National or State Register Eligibility:

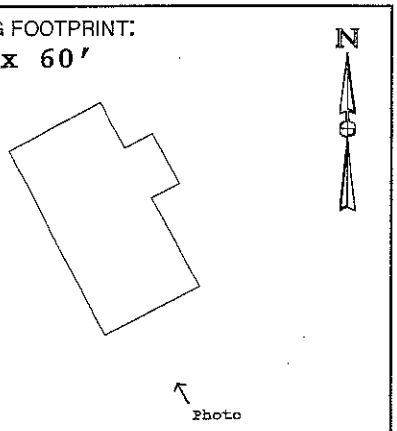
[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.



BUILDING FOOTPRINT:
30' x 60'



Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1194 is a rectangular, single-story, high bay structure made of concrete masonry units (CMU) and exhibiting a flat roof. The principal elevation faces west, showing one large roll-up door, and one personnel door. One row of windows is located below the eave line at the north and south elevations. The ceiling at the interior is exposed. "As-built" construction drawings show that Building 1194 was completed in 1952. W. C. Kruger Co. (Santa Fe, NM) provided the architectural work (1952: CE File 1194). The builder is unknown. No structural modifications to the original structure were noted.

III. HISTORIC AND CURRENT USE:

Current Function: Research equipment storage.

Original Function: Missile Assembly Test Building/Booster Inspection.

Interim Functions: "Mls/Space Rsch Tst" (n.d.); "M/Assembly Test Bldg" (n.d.); "Shp Wpn and Rlse Sys" (c1976); "BE Stor Cv Fclty" (n.d.); "Rsch Equip Stor" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1195-1 (c1952).

Foundation: Poured concrete footings and stem wall. Slab on compacted fill.

Exterior walls: CMU between concrete columns and bond beams.

Roof: BUR gravel. Rigid insulation. 2" concrete deck supported by steel joists.

Notable interior features, including machinery:

4-ton Wright Company chain-operated crane and hoist system, hoist no. 5197, serial no. 4925. The hoist is attached to a runway "I"-beam (crane) supported by steel support beams. Large metal roll-up doors at east and west elevations.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

210

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1194, although not meeting the "exceptional importance" standard, may be eligible for the National Register for its role in early Cold War materiel development once the fifty-year construction date is met in 2002.

VII. ASSOCIATED BUILDINGS:

According to CE File #1195-1 (c1951) *Title Sheet*, Building 1194 was associated with Building 1190 (Change House), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1194 remains essentially as it was constructed c1952. The original floor plan layout included one main room and an equipment room. A small area in the northwest corner of the main room has been partitioned. No documentation was found pertaining to this modification. This minor partitioning of the main room is reversible. This building is no longer associated with either missile assembly and test activities or unconventional fuels storage, and currently serves as an equipment storage room for the 6585th Test Group. Construction drawings (1956: CE File # 1194-1) show that an addition to this building was planned. There is no indication that this addition was ever built. Because this building retains historic integrity, and may be eligible for the National Register under Criteria A and/or C once the 50-year construction date is reached in the year 2002, recommend that future modifications take essential design features into account. Note: One isolated occurrence of prehistoric artifacts was noted on the grounds north of the building, including one white chert core, and one secondary chert flake.

Suggested routine maintenance: Scrape, prime, and paint the exterior. Replace downspouts. Prune landscape plantings away from foundation.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Construction drawings show plans for an addition to the north elevation (1956: CE File #1194-1). There is no evidence that this addition was ever built.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The high open-bay floor plan allowing the crane and hoist system, and the large metal equipment roll-up doors remain as key design elements.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Buildings 1193 and 1194 remain in an unmodified and isolated setting.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Nearly all of the historic materials used to construct this building remain visible.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two doors have been replaced. All windows appear to be original. Interior partitions at the northwest corner divide the original floor plan.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Although retaining its original open floor plan, this building is currently used for storage of modern equipment.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

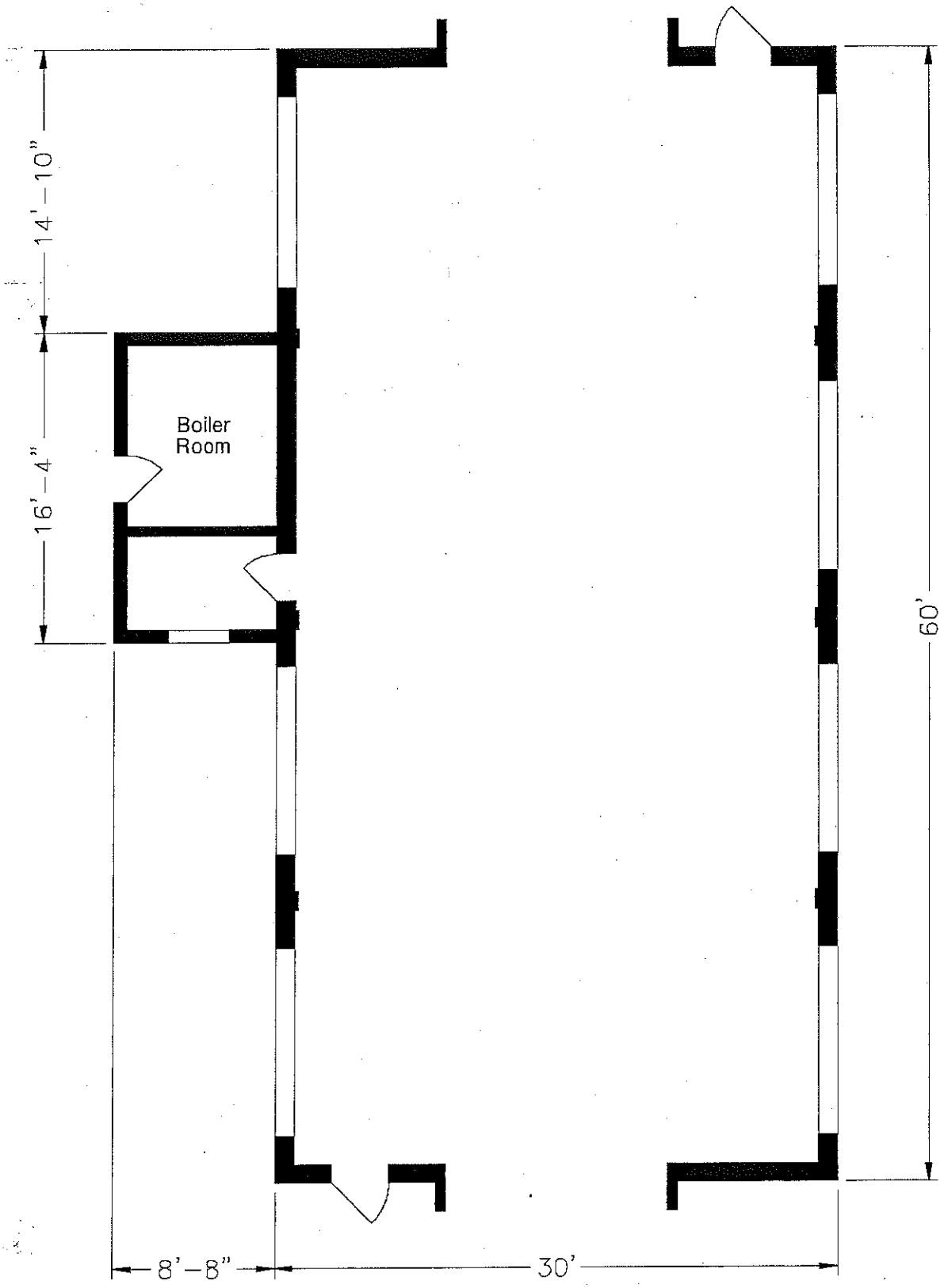
Comments: The open floor plan, isolated setting, hoist system, and nearby continuity check stand (Building 1193) contribute to this building's integrity of association.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #3-Photo #31**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1195-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1194** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1196

This building was constructed in 1956. It originally built for missile assembly, but is now in communications equipment storage.
The original facilities consisted of:

- Toilet
- Lavatory

These facilities were replaced in 1975 with:

- Toilet
- Urinal
- Lavatory

An on site inspection for this building was done on 4 Dec 07 with the current facility manager Sgt Lander. The information gathered from this inspection was that there were not any floor drains located within the building. In the past it was used for TAC can and for the past ten years it has been used for storage.
Attachment 55d shows where the leach field for Bldg. 1196 was located in 1984.

Figure 6: Picture of Bldg. 1196

INACTIVE SEPTIC SYSTEMS

BUILDING 1199

This building was constructed in 1957. It was originally built as a rocket fuel laboratory. In 1987 it was converted to the Security Forces Kennel.
As the fuels laboratory, it contained:

- Toilet
- Urinal
- Lavatory
- Shower

After conversion to the kennel, the facilities were changed to:

- Toilet
- Urinal
- Stainless Steel Sink

During the investigation stage of the project there were drawings found for building 1199. Attachment 12 and 13 are of the Site Plan, the Sewer Isometric, the Plumbing Plan and the Floor Plan.

Along with the drawings that were found an on site inspection was completed on 29 Nov 07 with the current facility manager, SSgt Gilmore. A new Security Forces Kennel area has been built and now the building is currently being used to house animals until they can be transferred to Alamogordo Animal Control.

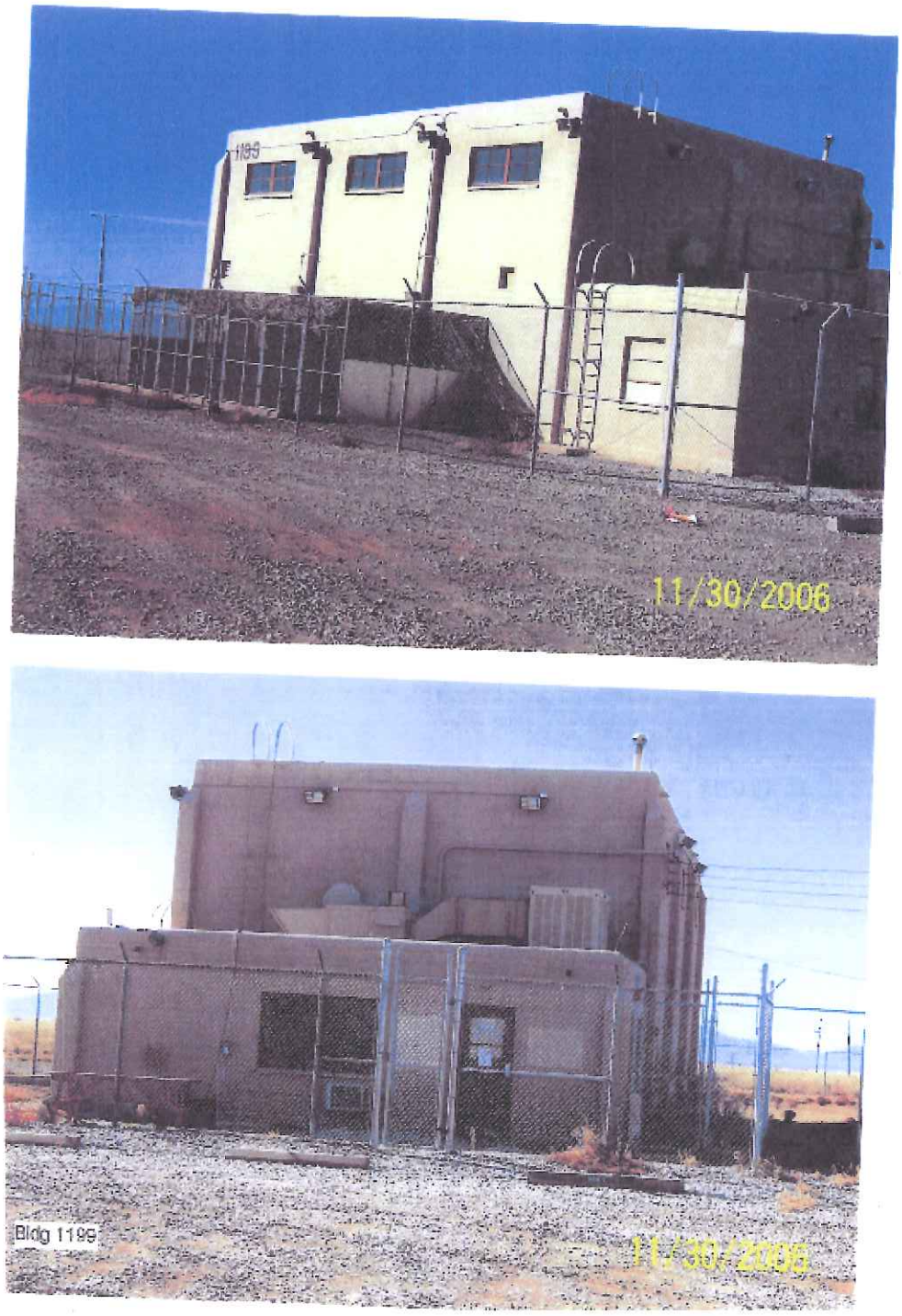


Figure 7: Pictures of Bldg 1199

INACTIVE SEPTIC SYSTEMS

BUILDING 1200

Specifications and History: See "Cold War Survey".

Three drawings were found for this building. These drawings show the Plumbing Floor Plan (Attachment 14), a Floor Plan (Attachment 15) and the Septic Tank and Drain Field (Attachment 16).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab, Medical (VACANT).
Historic: Space Biology Laboratory.
Street Address: 841 Douglas Road, HAFB, 88330-7823.

Building Number: 1200

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [ ] Needs maintenance [x] Deteriorated [ ] Archaeological

Comments: Building 1200 is abandoned, and showing signs of deterioration.

Degree of Alteration: [ ] None [ ] Minor [x] Moderate [ ] Major

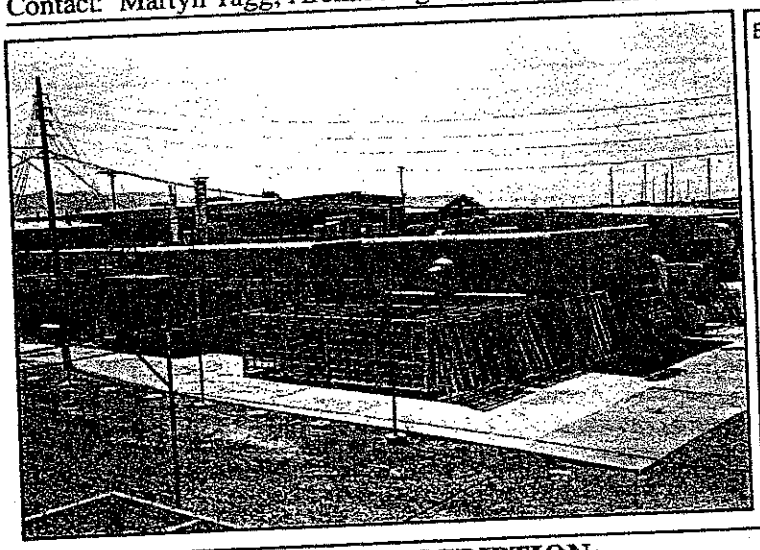
Comments: Alterations are architectural rather than structural.

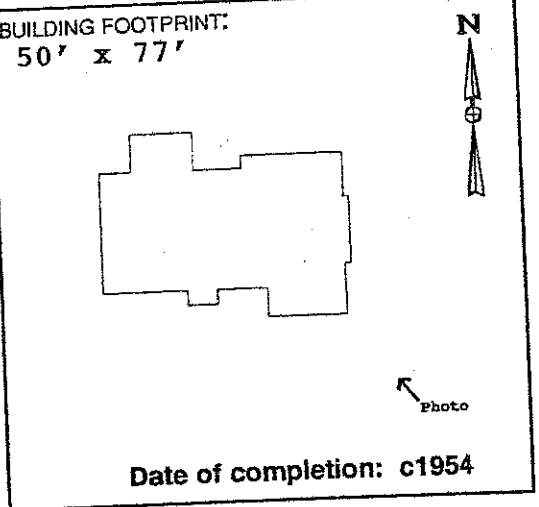
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1200 no longer retains historic integrity. See Section VI.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1954

273

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1200 is a rectangular, single-story, flat-roofed concrete masonry unit (CMU) building constructed as one of several laboratories dedicated to important aeromedical research using both animals and humans. None of the construction drawings were correctly stamped "As-built." According to Real Property Accountable Record/1200, the estimated date of construction is 1954. Subsequent improvements documented in CE File drawer #1200 include an addition to the medical lab (c1958), a covered passageway added to the boiler room (c1957), and a frame wall addition to the surgery room (c1957). Neither the builder nor the architect is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1200; Field visit Summer 1995.

Current Function: Vacant.

Original Function: Space Biology laboratory/Animal experimentation.

Interim Functions: Animal experimentation/Storage.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1200-1 (c1953).

Foundation: Concrete wall footings. Concrete slab on fill.

Exterior walls: Painted concrete masonry units (CMU).

Roof: BUR on concrete deck, supported by metal lathe and steel bar joists.

Notable interior features, including machinery:

Originally used as a medical laboratory, with work tables, work benches, built-in lockers, cabinets, operating tables, x-ray tables, etc.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:

274

One room is currently being used for storage. All medical and laboratory equipment has been removed.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Due to extensive alterations to the exterior, Building 1200 no longer retains historic integrity. Recommend, however, that this building be considered as a contributing feature in a basewide early Cold War National Register of Historic Places Multiple Property nomination.

VII. ASSOCIATED BUILDINGS:

Building 1200 was an integral part of Holloman's aeromedical facilities, including Buildings 1201, 1202, 1203, 1204, 1205, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Since its original construction c1954, Building 1200 has been used as a laboratory and medical facility for a wide variety of research animals, including trout, black bear, dogs, mice, and chimpanzees. Although currently abandoned, this building featured a lead-lined x-ray room, an autopsy room, an observation room, a surgery room, a dark room, and animal pens (c1954: CE File #1200-1). Built-in steel lockers, metal cages, x-ray tables, work benches, food bins, operating tables, scrub sinks, surgical lamps, sterilizers, etc. have been removed. Two exterior doors have been blocked in, and thirteen exterior windows have been blocked in. One exterior door and one exterior window have been added. Interior walls have been added, removed, or relocated. A storage room has been added to the south elevation. Animal cages remain at the west elevation. The presence of dead rodents, foul odors, torn pipe and duct insulation (possible containing asbestos) and peeling paint (possible lead-based) represent hazards to health and safety. Because of the unique and important nature of the research conducted here, recommend that this building be nominated as a contributing feature as part of an HAFB early Cold War National Register Multiple Property nomination.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?
[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.
Comments: The building has been located at its present location since c1954.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?
[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact
Comments: Most of the original doors and windows have been removed. All of the equipment has been removed. Most of the original finishes have been obscured.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting
To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting
Comments: Continues to be situated in an isolated setting with the other Aeromedical facilities.

Materials: To what extent have the original materials used to construct this structure been retained?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Elevations have changed due to modified openings, an addition, and a covered passageway. Interior wainscot and cornice removed, wall tile added.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Exterior walls and cages remain intact. Some architectural features remain. Most of the original interior workmanship has been lost.

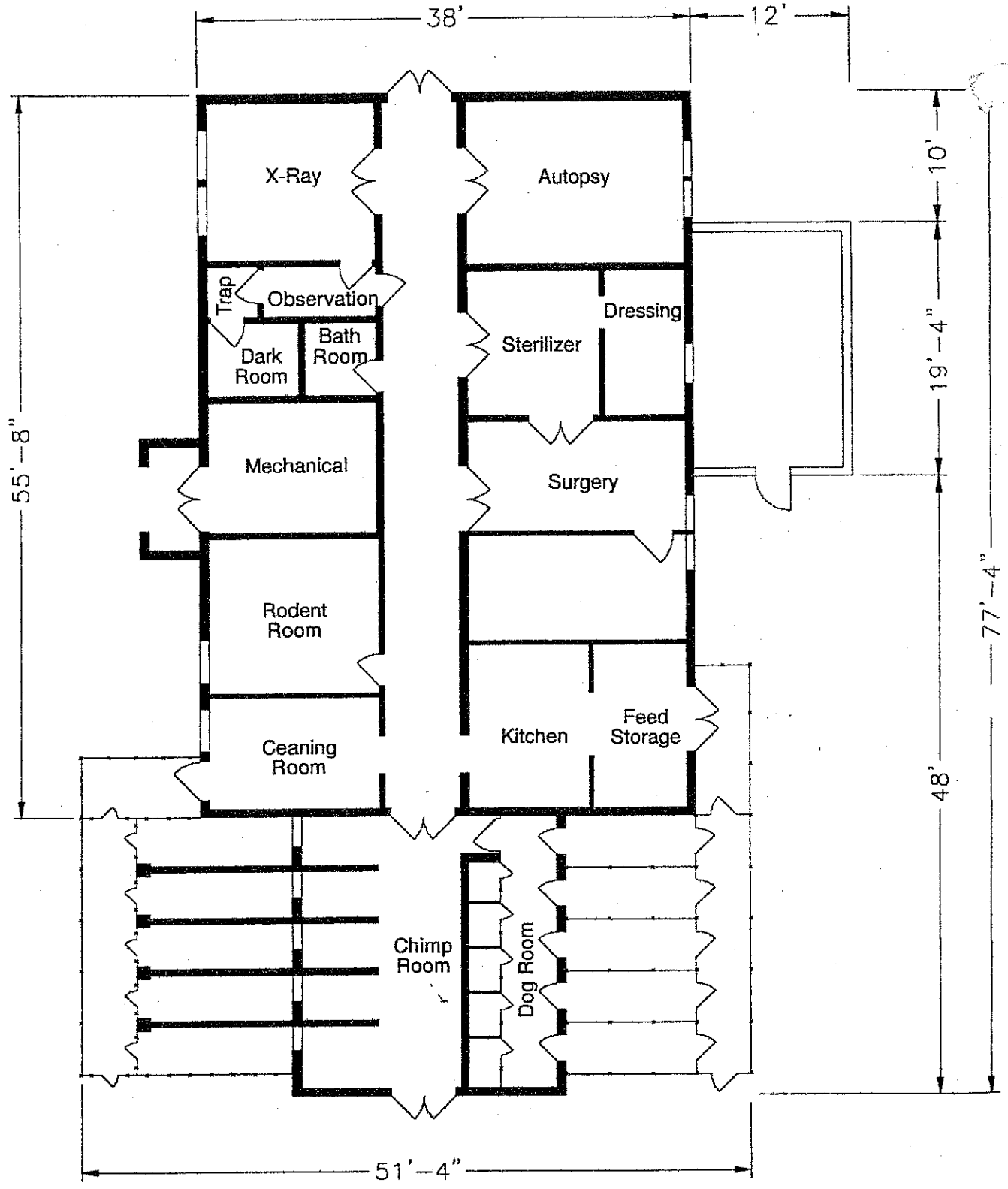
Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?
[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity
Comments: Building 1200 continues to be situated within the compound set aside for animal research. Chimpanzee research continues today in nearby buildings.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?
[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity
Comments: Although all of the equipment has been removed, this building still demonstrates a link with its past by virtue of its setting, the odors, and the animal cages.

X. FURTHER INFORMATION:

Surveyed By:
Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #94**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1200-1 (c1954)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1200** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

BUILDING 1201

Specifications and History: See "Cold War Survey"

Seven drawings were found for this building. These drawings show the Septic Tank and Absorbent Area Layout, Isometric Sewer Layout, Septic Tank Plan and Septic Tank Elevation (Attachment 17), Floor Plan (Attachment 18), Layout Plan (Attachment 19) and Systematic-Waste System (Attachment 20).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab Medical.
Historic: Aero. Medical Field Lab.
Street Address: 821 Douglas Road, HAFB, 88330-7823.

Building Number: 1201

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Structurally intact. In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

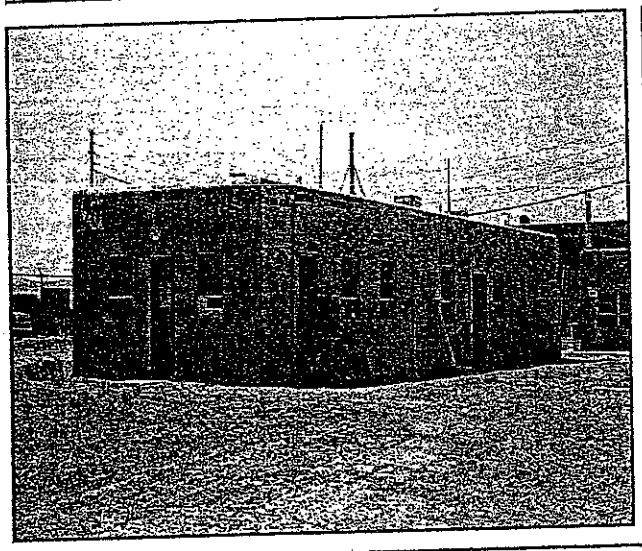
Comments: Mortuary/autopsy room added as subsequent improvement c1958.

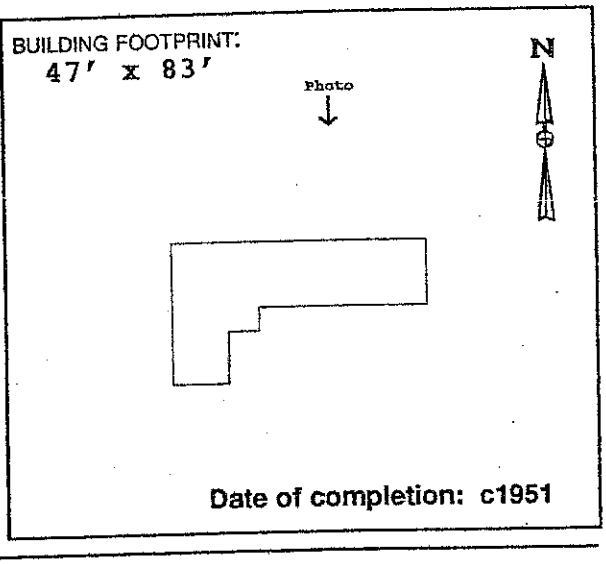
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible under Criteria A and/or C at a national level.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1951

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1201 is an "L-shaped", single-story, flat-roofed, building constructed primarily using painted 8" structural clay tile and exhibiting asymmetrical door and window placement. Animal cages occupy the west elevation. Real Property Accountable Record/1201 indicates that this science laboratory was constructed c1951. The construction drawings consulted were stamped "As-Built," although no date was given. Both the architect and builder are unknown.

At least two structural modifications may be viewed as subsequent improvements to the original building, including the addition of a Mortuary/ Autopsy Room (c1958: CE File #1201-4), and the addition of a rooftop observation deck (c1952: CE File #1201-5).

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1201.

Current Function: Carpentry shop; Employee break room; Office space.

Original Function: Aerospace Medical Lab; Animal experimentation.

Interim Functions: "SC Lab Human Eng" (n.d.); "SC Lab Med (c1968).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1201-1 (c1951).

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted structural clay tile.

Roof: Built-up roof w/ gravel on sheeting, supported by 2x12 wood joists.

Notable interior features, including machinery:

Fixed chain link cages, lab tables, equipment tables, work tables, wood storage bins, sterilizer, incubator.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL: (Based on field visit Summer 1995

[c1958 SUBSEQUENT IMPROVEMENT--MORTUARY/AUTOPSY]:

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted cement masonry unit (CMU).

Roof: 5-Ply built up roof on concrete slab. Steel joists.

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Notable interior features, including machinery:

Washer and dryer, kitchenette, tool room, table saw, furniture, lockers.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1201 is eligible to the National Register under Criteria A and/or C at a national level of significance for its vital role in early aeromedical research in support of the early Cold War space exploration mission.

VII. ASSOCIATED BUILDINGS:

Building 1201 was associated with the other Aeromedical facilities, including Buildings 1200, 1202, 1203, 1204, 1205, 1206, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1201 retains historic integrity as far as the structure itself goes. Very little physical evidence remains of this structure's original use as an animal laboratory. The cages have been removed. Two interior walls with doors have been added. One interior wall has been removed. Service sinks, work tables, wooden bins, an incubator, and other lab support items shown on c1951 construction drawings have been removed. An area of the original roof approx. 10' x 13' was reinforced with three inches of concrete for observation deck c1952 (CE File #1201-5). A mortuary/autopsy room was added c1958. These additions may be viewed as early improvements, and do not diminish Building 1201's historic integrity. Drawings itemize a "2-body" mortuary room, an autopsy table, a band saw, cabinets, a sterilizer, a photography area, and other laboratory equipment. This equipment has been removed. This room currently serves as a lounge area for employees. Due to the important research conducted here in support of this nation's space program, further research is warranted. Recommend that Building 1201 be included in a Cold War-era Multiple Property nomination. Suggested routine maintenance: This building is showing the signs of long-term neglect. Fill the stress cracks at the exterior corners. Scrape and paint exterior walls. Replace window glass and door hardware as needed.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Continues to be situated in an isolated compound.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Original structure essentially intact. Interior lab equipment and cages removed.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Enclosed by chain link fence topped with barbed wire, along with other research facilities. Chimpanzee research continues in nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Clay tile walls still intact. Some glass block windows remain. Some glass block windows blocked in when addition constructed. Floor tiles removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Roof, walls, and exterior openings remain essentially the same. The east elevation changed due to an early addition. Interior partitions, openings, and finishes have changed.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Historic photographs show that the natural, historic, and aesthetic character of Building 1201 has been retained.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

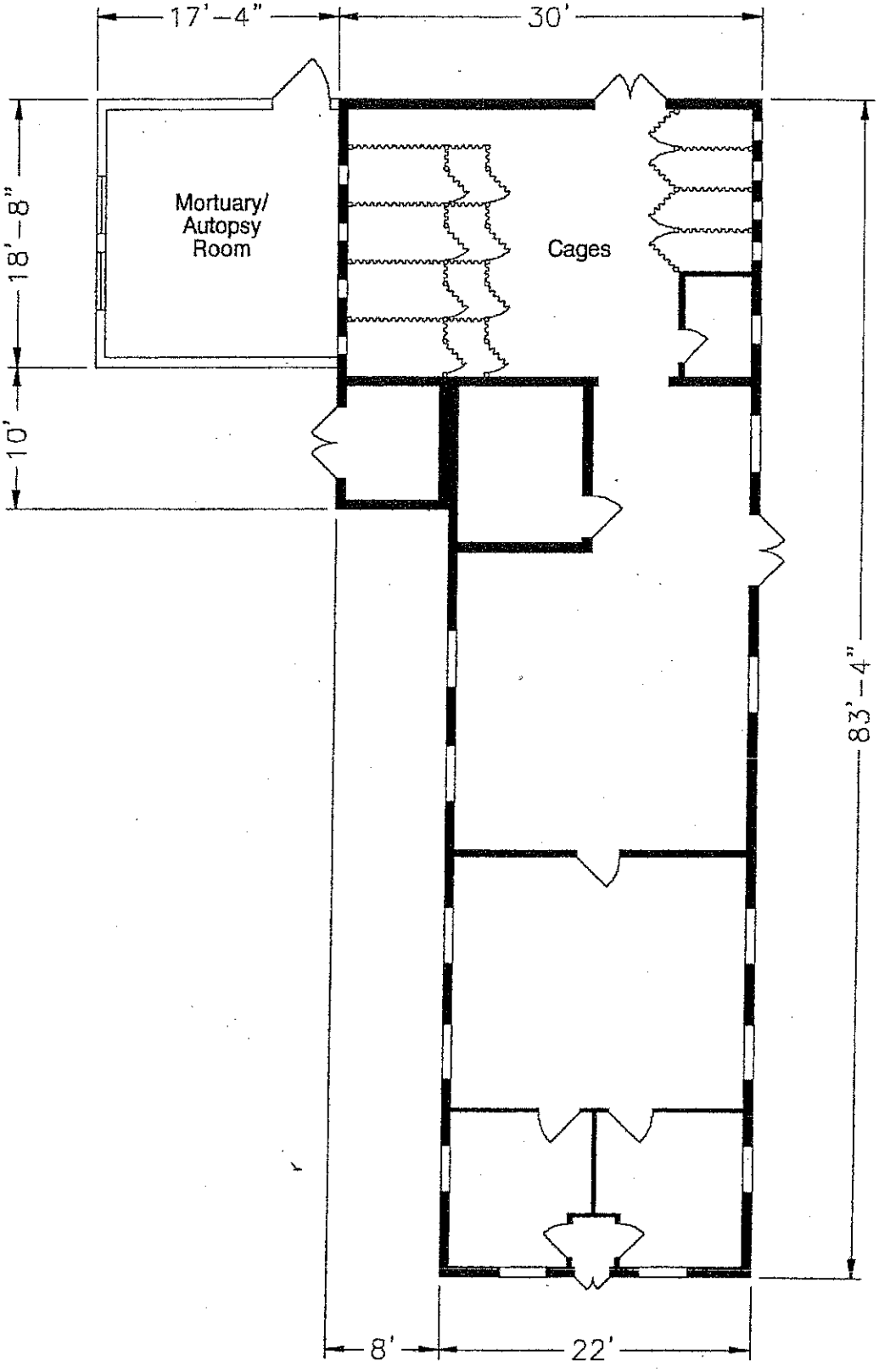
Comments: Building 1201 retains a visible link with its period of significance.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #91**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1995**



280

Source: CE File #1201-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1201** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

Buildings 1219, 1221, 1235 and 1239
An on site inspection was completed on 20 Dec 07 with the current facilities manager, TSgt Pote, he has been the facilities manager for the past nine years. During the inspection it was discovered that there are sink holes on all leach fields in the compound. All buildings in this compound have separate drains for the bathrooms. All buildings are also currently connect to the base sewer system.
Attachment 55d shows the leach field location for Buildings 1219, 1221, 1235 and 1239.

BUILDING 1219

This building is the Administrative Offices for the Munitions Maintenance Squadron. It was constructed in 1985 and covers 4476 SF.
There are Men's and Women's Bathrooms that discharged into two (2) septic tanks prior to the installation of a sewer main that discharges to the Base Waste Water Treatment Plant.

INACTIVE SEPTIC SYSTEMS

Building 1221

This building is in the Ammo Depot and was originally constructed for ammunition storage. It was later switched to store inert munitions.
The building was constructed in 1983 and covers 2857 SF.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan (Attachment 21), Floor Plan (Attachment 22), Partial Plan (Attachment 23), Septic Tank Details and Sewage Disposal System (Attachment 24) and a Profile of Sewer Line Septic Tank and Disposal Field (Attachment 25).

INACTIVE SEPTIC SYSTEMS

BUILDING 1226

This is a munitions maintenance shop building constructed in 1985. It has 2945 SF of floor space.
Facilities installed include:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Utilities Plan (Attachment 26), Plumbing Demolition Plan (Attachment 27), Plumbing and HVAC Plan (Attachment 28) and Waster/Water Piping Detail (Attachment 29).

In Figure 8 on the following page it can clearly be seen where the leach field is in relation to where building 1226. This is the leach field for building 1219, 1221, 1235 and 1239 as well. In Attachment 46 (a map showing many of the building on Holloman AFB) it can be seen where building 1226 is in relation to these building.

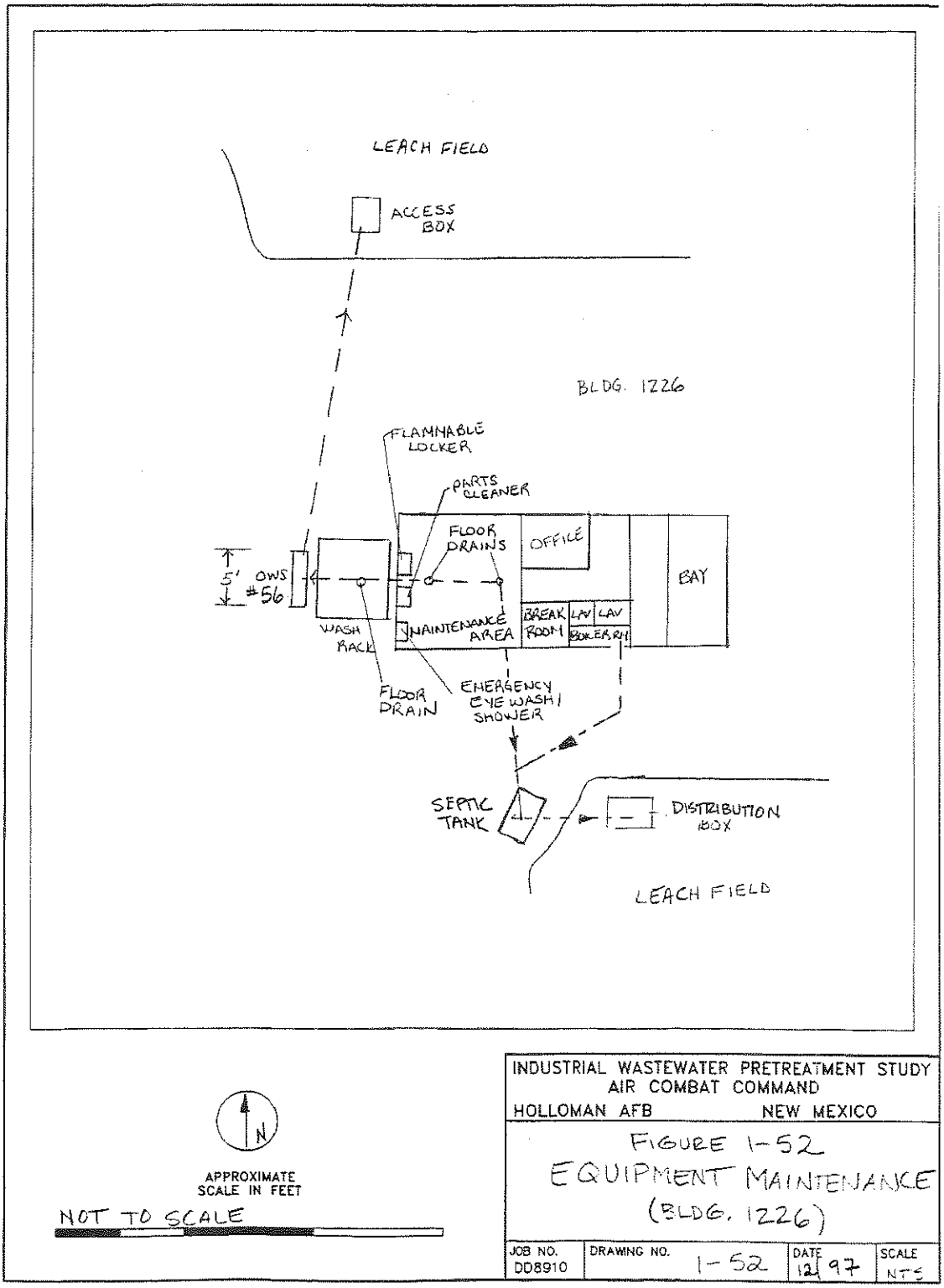


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Figure 8: Drawing of Leach field

INACTIVE SEPTIC SYSTEMS

BUILDING 1235

This building was constructed in 1964 and contains 3000 SF of floor space.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, a drawing for this building was also located. This drawing (Attachment 30) shows the Site Plan, Septic Tank Details and Sewer Clean Out.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST

INACTIVE SEPTIC SYSTEMS

BUILDING 1239

This is another building in the Ammo Depot. It was constructed in 1971 and contains 1920 SF.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Urinal
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan, Septic Tank Details, Utility Plan (Attachment 31), Floor Plan (Attachment 32), Grading Plan (Attachment 33) and Lavatory Detail (Attachment 34).

INACTIVE SEPTIC SYSTEMS

BUILDING 1250

This building was constructed in 1957 and contains 2890 SF.
It was originally a water pumping station. In 1985 it was changed into a storage facility. As part of the change in service the bathroom facilities were removed. Currently it has a large infestation of vectors and it is unsafe to go inside. The POC for this building is Mr. Chuck Price.
The original facilities consisted of:

- Toilet
- Lavatory
- Floor drains for the water pumps

INACTIVE SEPTIC SYSTEMS

BUILDING 1251

This building was constructed in 1965 and contains 1300 SF.
In the records it is listed as a Research and Testing Shop. It currently has a large infestation of vectors, therefore it is not safe to go inside. The building has been vacant since the mid 90's. The point of contact for this building is Mrs. Eisele.
It contains the following facilities:

- Toilet
- Lavatory

INACTIVE SEPTIC SYSTEMS

BUILDING 1269

This building was constructed in 1966 and contains 3262 SF.
The original service was a Medical Science Laboratory. It has been relegated to a storage facility.
The facilities consisted of:

- Toilet
- Lavatory
- Kitchen Sink with Garbage Disposal

Site Specific Contingency Plan: See Attachment 1

Max. Spill Quantity (gal): 55

Chemical	Container Type
Benzene	NA
Acetonitrile	

REMOVED SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	1102	1952	6'x4'x8'10"	2500
2	1103	1948	7'x9'x3'2"	1412
3	1108	1958	6'x9'6"x6'3"	750
4	1119			
5	1150	1953	4'x9'x6'3"	2500
6	1154			
7	1166	1960		450
8	1175	1949	5'1"x10'4"x6'10"	2970
9	1176	1959		640
10	1265	1992		1200
11	1173			

REMOVED SEPTIC SYSTEMS

BUILDING 1102

Specifications and History: See "Cold War Survey." More information can be seen in the drawings. The drawings that have been found for this building are as follows the Grading Plan (Attachment 35), Septic Tank Details and Boring Log Results (Attachment 36), Leaching Well and Cover Details and Sewer Clean Out (Attachment 37).

Attachment 55c shows where the leach field was located for this building in 1984.

This building has the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Missile Radar Station.
Historic: Radar Triangulation: King I.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1102

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

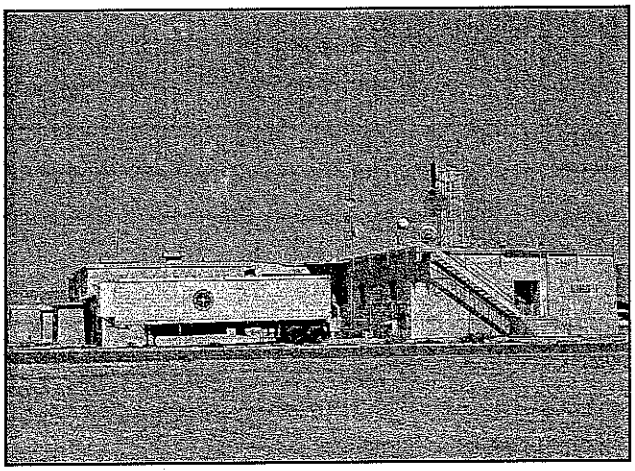
Comments: Essential structural and architectural features remain intact.

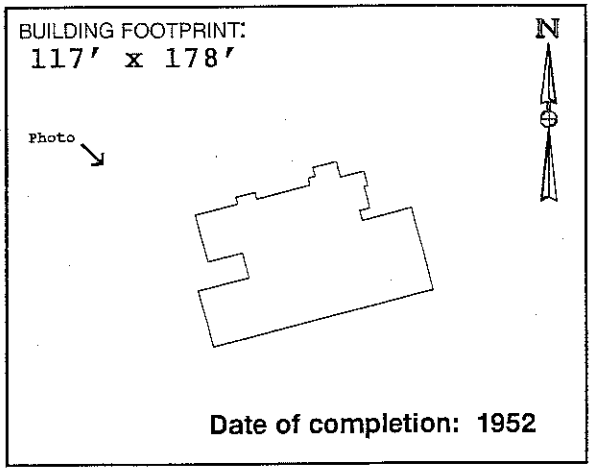
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Recommend listing as part of a Cold War Multiple Property.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1102 is a one-story concrete masonry unit, multi-shaped building with a central corridor running east-west the entire length and single rooms flanking both sides of the corridor. Original footprint shows primarily rectangular shape with a central projecting core. This core is a large open room with an upper balcony around its perimeter. Construction of the original building was completed in 1952, according to "As-built" drawings in CE File #1102-1. Surveillance display room added in 1969 (CE File #1102-1). It is unclear when north elevation additions constructed, although information in Real Property Accountable Record/1102 date the additions as being post-1970. The architect for this project was W. C. Kruger (Santa Fe, NM). The builder is unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1102.

Current Function: Telemetry and Optics. Altitude measurements.

Original Function: Missile Instrumentation Station; Mission Control.

Interim Functions: Missile Radar Station.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1102-1 (c1952).

Foundation: Concrete footing and foundation wall. Column spread footing.

Exterior walls: Concrete masonry units (CMU).

Roof: Bituminous concrete over built-up roof, ltweight concrete, supported by one-way concrete slab using concrete beams and steel beams encased in concrete.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

380

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Eligible under Criteria A and/or C at a national level of significance for important role in early Cold War-era missile and High Speed Test Track mission control and tracking. Further research recommended.

VII. ASSOCIATED BUILDINGS:

Building 1102 supported all missions at White Sands Missile Range and at Holloman Air Force Base until Building 300 and possibly 1527 at White Sands were constructed.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1102 continues to operate as a mission control building, with mostly optics and telemetry functions. The Flight and Instrument Control Room, and the Surveillance Radar rooms are vacant. Originally, missiles were fired using an analog boards (mechanical) system. When operations changed to a digital system in c1978, support moved from the central instrument control room to the north addition off of this room. Nearly all of the original interior finishes remain unchanged.

Suggested routine maintenance: Scrape, prime, and paint all block and concrete surfaces. Remove vegetation and rusted pipes by gas meter. Fill depressions at foundation, and regrade using gravel to promote positive drainage. Fill holes at concrete stoops. Replace wood bumper at dock using similar-sized lumber. Secure panel covers on abandoned electrical panels. Enclose live connections in junction boxes. Scrape, prime, and paint metal stairs. Reattach stair nose treads. Remove miscellaneous debris from building perimeter.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Still situated at the northeast corner of the intersection of Tula Peak Road, and Douglas Road.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The original floor plan remains intact.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Continues to be situated at the intersection of two roads in an isolated setting with few nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Most all original materials have been retained at both the exterior and the interior.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: All original exterior and interior room finishes remain visible. At the south elevation, one window is blocked, one window has been replaced with a door, and the door at the loading dock has been replaced. Most of the north elevation is obscured by the addition of an operations room.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1102 continues to support limited mission control operations.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

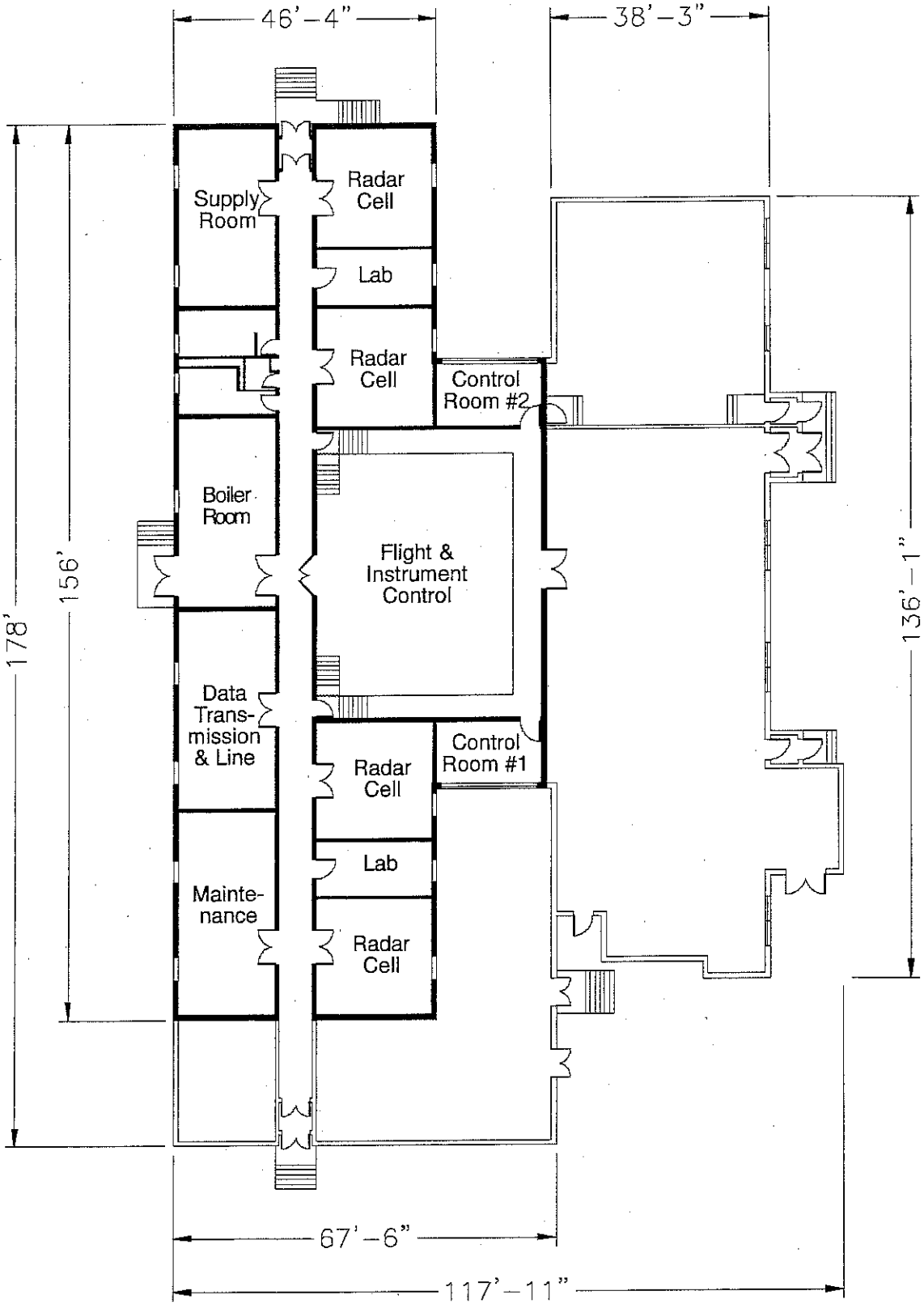
Comments: Building 1102 retains an evident link with its aesthetic and functional historic character.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #49**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1102-1 (c1952)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1102** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-6401* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1103

Specifications and History: See "Cold War Survey" the Layout Plan (Attachment 38) has also been provided.

Attachment 55c shows where the leach field was located for this building in 1984.

Facilities: This building contains the following facilities.

- Tiolets-2
- Urinals-2
- Lavatories-3
- Service Sinks-3

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Timing.
Historic: Telemetering Building.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1103

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance only.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

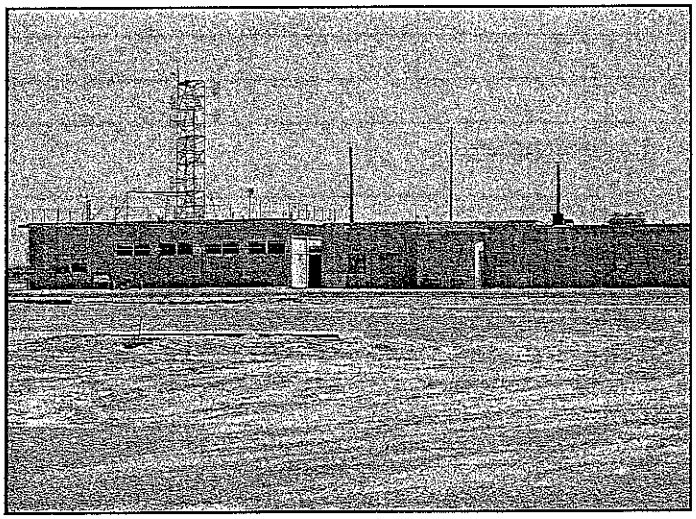
Comments: Few alterations since early improvements.

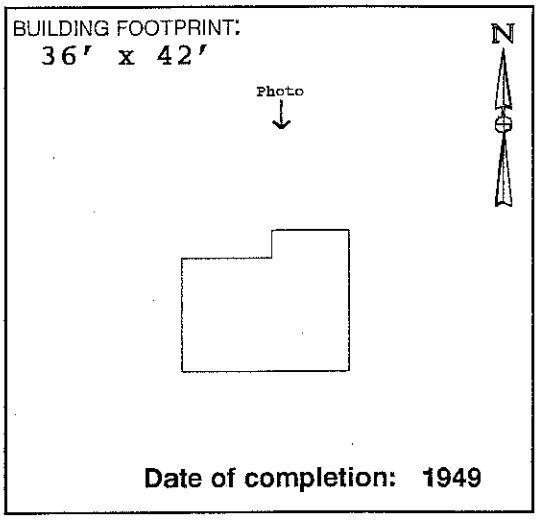
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Research recommended to determine historic use. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1103 is a one-story rectangular building with concrete masonry unit walls, and a flat roof. The original building was completed in 1949, according to "As-built" drawings located in CE File #1103-1. This original construction is centrally located, flanked to the east and west by subsequent additions. Real Property Accountable Record/1103 documents the addition of 2,930 square feet to the original building with the notation "Subsequent Improvements thru May 57." One or both additions to the original building may therefore be considered to be subsequent improvements, rather than additions that compromise historic integrity. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE: (Personal communication with Building 1103 personnel)

Current Function: (East end) Leased by WSMR to transmit mission timings.

Current Function: (West end) Unknown.

Original Function: Telemetering station for data collection of Range missions.

Interim Functions: Real Property Accountable Record/1103: "Communications CTR" (c1962); "Telecom Cen" (c1971); "Comm Fclty" (c1980); "Elec Rsch Rdr" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1103-2 (1967); CE File #1103-1 (1949).

Foundation: Concrete wall footing.

Exterior walls: Painted concrete masonry units (CMU).

Roof: Built-up roof on wood sheathing and 2 x 8 wood joists.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Although perhaps not meeting the "exceptional importance" stipulation imposed on buildings constructed within the last fifty years, Building 1103 may be eligbile for the National Register under Criterion A at a regional or national level in the year 1999. If further research determines that Building 1103 is not eligible as an individual property, consideration should be given to its eligibility as a contributing feature in a Cold War Multiple Property submission for its support of early Cold War-era test launches.

VII. ASSOCIATED BUILDINGS:

Building 1103 was associated during its historic period of significance with Building 1102, mobile data collection vans, and Building 300 at White Sands Missile Range.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1103 appears very different today from depictions on "As-built" drawings dated 1949. It is unclear whether additions to the east and west ends of the original building represent early improvements to the original building, or whether these additions represent later construction that has compromised the historic integrity of the original building. Information obtained from Real Property Record/1103 and field visits seems to indicate that the additions represent early improvements to the original building. If so, Building 1103 retains historic integrity. Further research is needed to verify the construction sequence, and to verify what early Cold War-era research activities were supported by Building 1103. Currently, Building 1103 is leased by the White Sands Missile Range. Aside from minor partitioning at the telemetering room, the original floor plan of the original building shows no alterations. Wood posts (6 x 6) that appear on original drawings to support the roof girders have been removed.

Suggested routine maintenance: Repair, or replace in kind, the exterior wood architectural features, including the soffit, fascia, wood doors, and louvers. Patch spalling concrete at foundation. Remove vegetation at roof.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Original telemetering room is now used as spare equipment storage.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Earlier location plans indicate three utility buildings situated in a row next to Building 1103 to the east. These buildings have been removed. Continues to be set in a somewhat isolated setting, in the vicinity of King-I.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Unable to access some rooms. Those rooms that were accessed, however, appear to have most of the original materials intact. A brick chimney and a metal stack have been removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original windows at north elevation have been covered up at the interior. The telemetering room has been partitioned (reversible).

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity

Comments: Building 1103 personnel are actively engaged in serving as a timing link for White Sands Missile Range tests.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

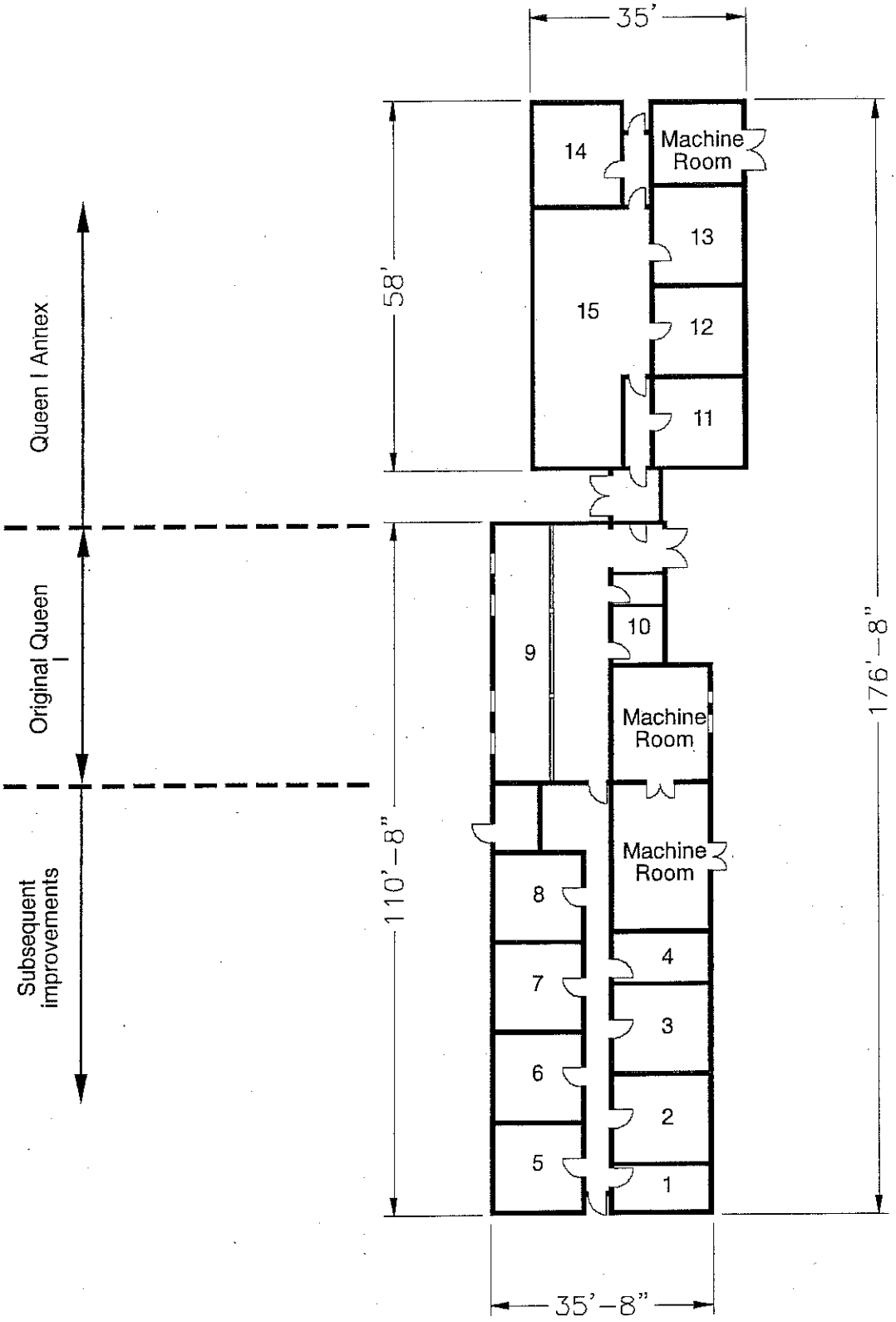
Comments: Building 1103 continues to provide support to the White Sands Missile Range.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #47**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: Dynalectron *Facilities Handbook*, c1964.

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1103** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1108

This building was constructed in 1958 and contains 2626 SF of floor space.
The building was originally built to serve as the telephone exchange. In 1980 it was retitled as a communications facility.
The building contains the following facilities:

- Toilet
- Lavatory
- Janitorial Sink

The drawings provided (Attachment 39-40) show a Utility Plot Plan, Septic Tank Details, Sewer Clean Out, Toilet Room Details and Plan Details.

Attachment 55e shows where the leach field was located for this building in 1984.

Site Specific Contingency Plan: See Attachment 1 and 2

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate into local area on ground

Tank location: North of facility

Fuel Flow - North

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST
MOGAS	250 gal each/ 2 /AST

REMOVED SEPTIC SYSTEMS

BUILDING 1119

This is an Army owned building that contains 2224 SF of floor space. Use and maintenance of the building was transferred to the Air Force in 2005. Prior to the Air Force taking possession the Army had delegated the building to the GSA for use as a vehicle maintenance shop. Once the Air Force took over, the building changed service to an electrical shop and storage facility.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
Diesel	250 gal ea/ 3 /AST
MOGAS	250 gal ea/ 2 /AST
Diesel	750 gal ea/ 3 /AST

Figure 9: Picture of Bldg 1119

REMOVED SEPTIC SYSTEMS

BUILDING 1150

This is also an Army owned building and therefore details are lacking from Holloman's records. The building has 2844 SF.
The original service is unknown, but since the Air Force started using the building it has been used as storage space.
It contains the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 9: Drawing of Bldg 1150

REMOVED SEPTIC SYSTEMS

BUILDING 1154

This is an Army owned building and there is no information in Holloman's files pertaining to this building.

Attachment 55c shows where the leach field was located for this building in 1984.

REMOVED SEPTIC SYSTEMS

BUILDING 1166

This building was constructed in 1960 and contains 4955 SF. The structure is a Test Track Shop/Storage Building known as the "Break Setter Building".
The facilities include:

- Toilets-2
- Urinal
- Lavatory
- Shower

Attachment 41 is a drawing showing the sewer layout and the septic tank details.

Attachment 55c shows where the leach field was located for this building in 1984.

Site Specific Contingency Action: See Attachment 3

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate in local area on ground; if full tank or drum spilled' the substance may reach open ditch.

Material Compatibility: No material incompatibilities

Chemical	Container Type
Oil/Water Separator Waste	500 gal/ 1 / UST

Figure 10: Picture of Bldg. 1166

REMOVED SEPTIC SYSTEMS

BUILDING 1175

Specifications and History: See "Cold War Survey"
Facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

In Attachments 42-44 a trench pit, the toilet room details, the trench junction to UPS, the sanitary sewer manhole and water and sewer piping can be found for Bldg 1175.

Attachment 55c shows where the leach field was located for this building in 1984.

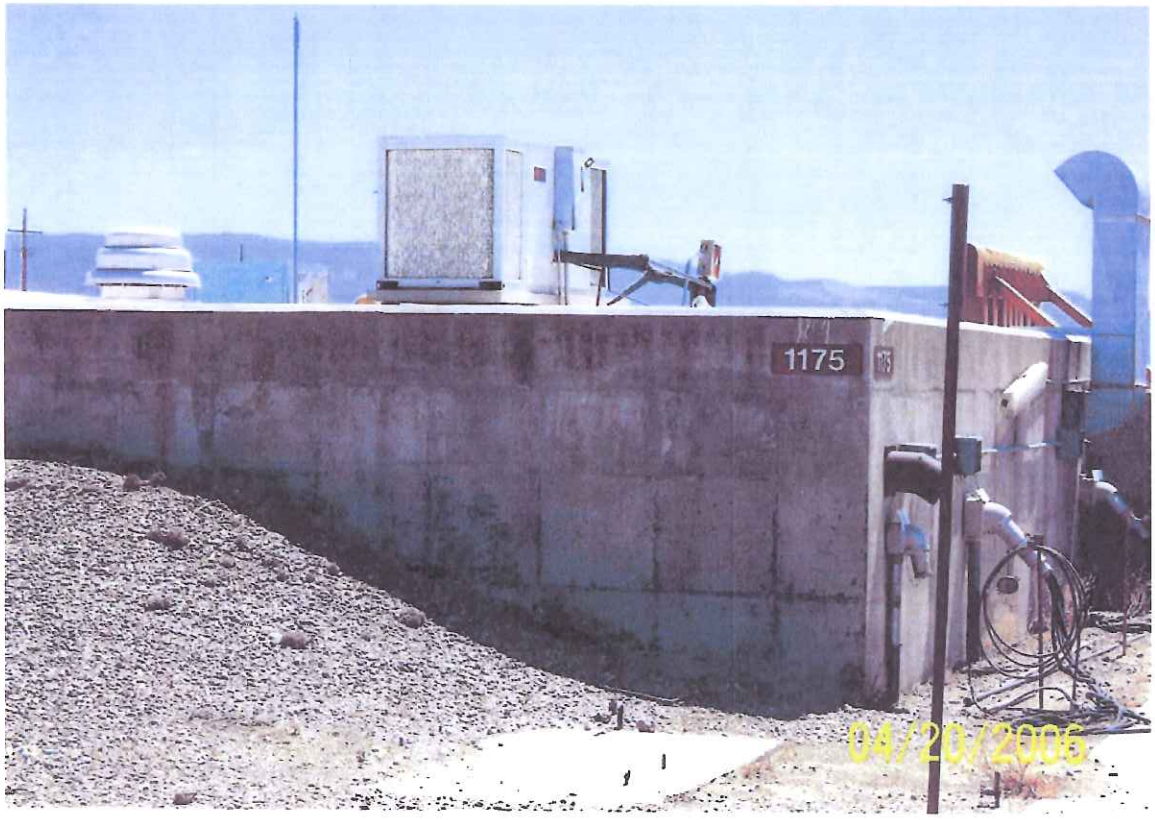


Figure 11: Picture of Bldg 1175

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Blockhouse--"Alpha".
Historic: Blockhouse--"Alpha".
Street Address: 1656 Test Track Rd., HAFB, 88330-7848.

Building Number: 1175

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1175 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

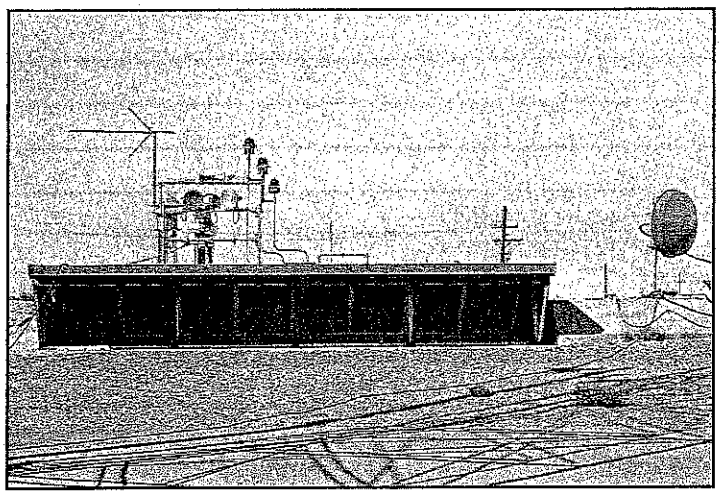
Comments: Modernization at interior to enable continued Test Track use.

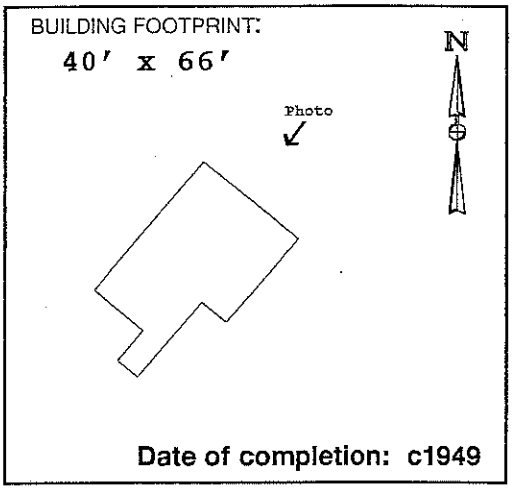
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible for the National Register under Criteria A and/or C.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1175 is an irregularly shaped, one-story concrete structure, built mostly below grade. The building is accessed by a ramp leading down to double doors at the southwest elevation. These doors access the original launch control room constructed in c1949. This entrance, three entrances off of the ramp, and windows facing the track (northeast) are the only visible openings. A 15′ x 32′-6″ addition was constructed at the northwest elevation in 1960 (CE File #1175-2). Another addition, adjacent to northwest side of ramp was completed in 1981 (CE File #1175-3). The ramp extension was also constructed at this time. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1175; CE File #1175-1 (c1949).

Current Function: Launch control facility, High Speed Test Track.

Original Function: Launch control facility, High Speed Test Track.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1175-1 (c1949); CE File #1175 (c1980).

Foundation: Concrete footings.

Exterior walls: Reinforced concrete.

Roof: 3-foot thick reinforced concrete.

Notable interior features, including machinery:
A long row of thick blast-proof windows faces the track to the northeast.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

366

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

"Alpha" Block house Building 1175 is one of the original High Speed Test Track support facilities, constructed c1949 to provide launch control. Recommend that Building 1175 be nominated under Criteria A and C as part of a basewide early Cold War Multiple Property listing.

VII. ASSOCIATED BUILDINGS:

Building 1175 operated, and continues to operate, in support of the high speed test track launching activities, along with Buildings 1162, 1163, 1161, 1645, and the Horizontal Test Stand facility (Buildings 1159 and 1160).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1175 retains historic integrity. Due to its national level of significance under Criteria A and C, recommend that Building 1175 be listed along with the other test track support buildings as part of a Multiple Property nomination to the National Register of Historic Places.

Subsequent improvements to the original Building 1175 augmented the original design and function as a launch control facility for important research conducted at the high speed test track. The interior was renovated in 1984 (CE File #1175-4). Although this renovation obscures original interior finishes, Building 1175 as a whole retains historic integrity of location, design, setting, workmanship, materials, feeling, and association. Of interest to future researchers may be the dramatic changes in computer technology which have occurred since the construction of Alpha Blockhouse: Computers which at that time required several rooms to house, now occupy considerably less space. Launch control operations continue at Alpha Blockhouse, although rooms designed to hold early equipment are virtually empty.

Suggested routine maintenance: Repair bond beam where steel is exposed. Remove vegetation at exterior embankments. Remove debris at front walkway.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Subsequent improvements to the original floor plan added to Building 1175's design and function as a launch control facility.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Except for the construction of smaller buildings in the vicinity, the original setting of Building 1175 near the test track launch pad has been retained.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: The raised wood floor in the console room has been removed. The original light fixtures have been removed. One wood and glass partition has been removed. Sheetrock® walls, carpeting, wainscot, and linoleum have been added to the control room.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original workmanship at the northeast elevation, and at the entrances at the ramp is still visible. Interior renovations hide the original architectural craftsmanship.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1175 continues to function as a launch control facility for the High Speed Test Track.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

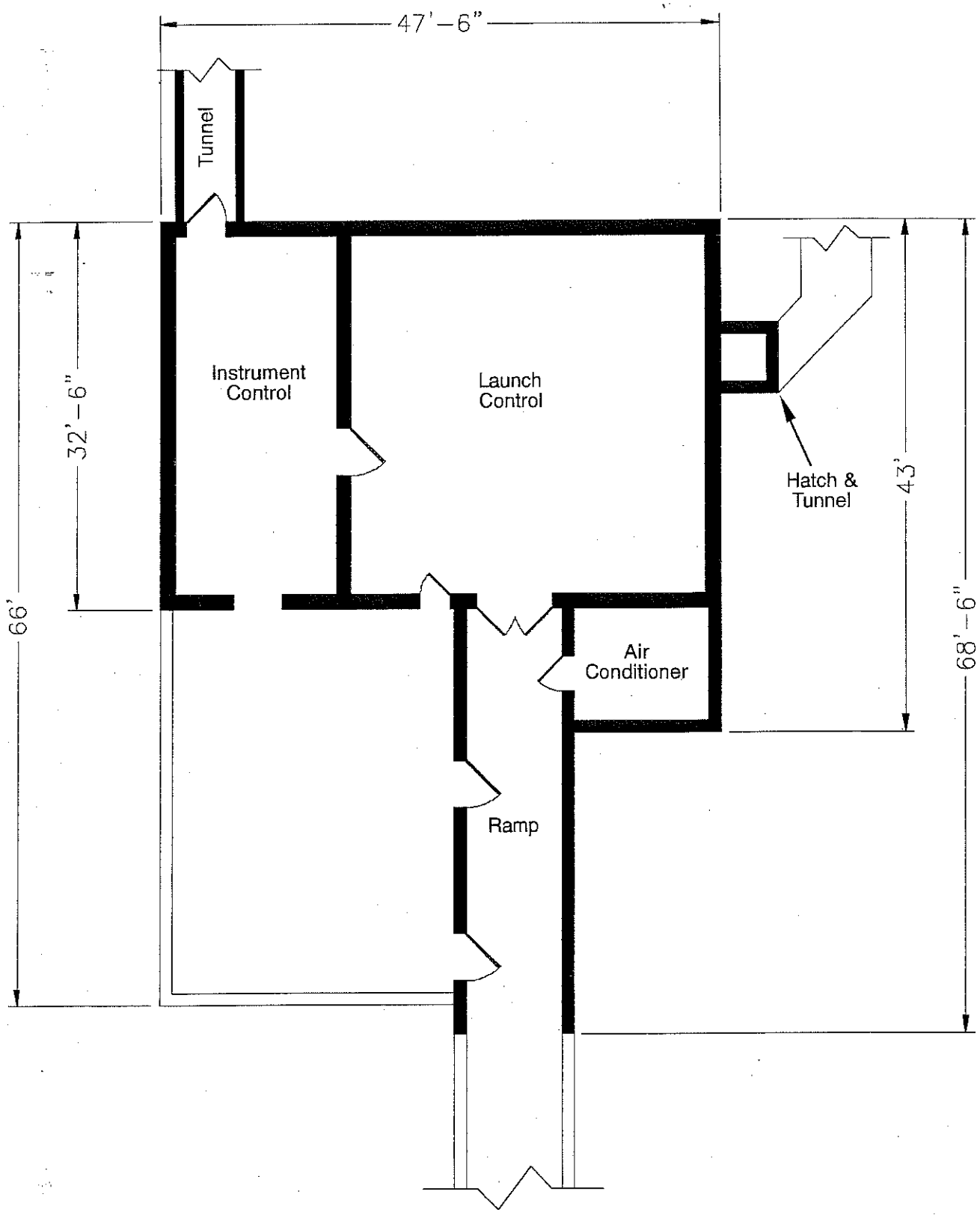
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #35**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1175 (c1980)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1175** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1176

This building was constructed in 1959 and contains 3850 SF.
The building is located at the Test Track and is known as the Sled Launch Shop.
Facilities include:

- Toilet
- Lavatory
- Shower

In Attachments 45-48 a plumbing plan, new drain pit, utility plan, sewer clean out, utilities contour plan and septic tank details can be found for Bldg 1176.

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 12: Picture of Bldg 1176

REMOVED SEPTIC SYSTEMS

BUILDING 1173

This building was constructed in 1957 and contains 17,428 SF.
The building is the main office building at the Test Track.
It contains the following facilities:

- Toilets-8
- Urinals-4
- Lavatories-9
- Janitorial Sinks-2

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 13: Picture of Bldg 1173

REMOVED SEPTIC SYSTEMS

BUILDING 1265

This building was constructed in 1957 and covers 43,388 SF.
This is the Inertial Guidance Facility, previously known as the Guided Weapons Lab.
The building contains the following facilities:

- Toilets-12
- Urinals-6
- Lavatories-12
- Janitorial Sinks-5

This building has been attached to the sewer system at Holloman AFB since before 1984.

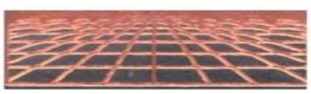
In Attachments 49-53 a Water Piping Diagram, Partial Plumbing Plan, Floor Plan, Building, Pavement and Utilities Layout, Sewer Clean Out, and Enlarged Plan can be found for Bldg 1265.

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-069

Appendix B
Geophysical Report

ULS SERVICES CORPORATION

GEOMARKOUT LOCATING Co a tradename



SAN DIEGO–LA . SF- SAC . SEATTLE . ALASKA . HAWAII- GUAM

1 (800) 528 – 8206 www.geomarkout.com 1 (866) 804 – 5734

---------- *A Veteran Owned Small Business* ----------

5 July 2012

Christopher Long, P.G.
Scientist
Federal Services
Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, TX 77077

Subject: Field Documentation Report for Geophysical Services -
Location of Utilities and Underground Features Associated
With Former UST and Septic System Sites,
Holloman AFB, NEW MEXICO (SHAW PO 783916-000 OP)

Gentlemen:

This report documents the recent Geophysical Survey field work ULS Services Corp completed at the subject site On and between the dates of 11 June 2012 thru 23 June 2012.

SHAW / ULS SERVICES CORP
GEOPHYSCIAL SERVICES
FORMER UST AND SEPTIC SYSTEM SITES
5 JULY 2012

SCOPE OF WORK

Scope of this work is includes geophysical services at approximately 29 Former UST or Septic Systems sites located across Holloman AFB that have reportedly undergone past abandonment in place or excavation activities. Geophysical services are employed in an attempt to locate potential USTs, former UST excavation areas, abandoned septic tanks or excavations and associated leach field areas. Location of underground utilities near these observed features is included. Observations are marked out in field and electronically mapped with GPS data collection and GIS presentation. Survey of each site is approximately 25 by 25 to 100 by 100 feet in size.

METHODS

Methods utilized in performance of this work include: Visual Inspection, Analog Real - Time Electromagnetic Induction Conductivity Detection (EMICD), Magnetic Locating (MGL), Ground Penetrating Radar (GPR), and EM Pipe and Cable Location (EMPCL). A sub-meter WAAS GPS receiver with automatic real -time differential correction and ESRI Arcpad software is utilized to collect observation data. ESRI Arc View 10 GIS software is utilized for mapping presentation.

EMIMD ground induction methods are employed to detect both 1) broad metal mass anomalies (Rectangular Surface Projections) or conductive zones that may be indicative of potential USTs – Septic tanks, conductive metal debris, steel reinforced concrete, UST's, building hosts, piping, building demo materials, drums, sumps or other unknown burial materials; and 2) to detect relative lateral changes in conductive zones of soil or backfill materials relative to native soils. Former UST excavations and septic -leachate material may potentially have a higher conductive response or well drained leachate fill materials associated with septic systems may in some cases exhibit a relatively lower or quiet conductive response relative to surrounding higher conductive soil response. A two-way Cartesian grid pattern of five by five feet is walked within the search area (site). Observations are real time and marked on ground surface with paint and pin flagging. Observations are collected with a sub- meter GPS with automatic differential correction and plotted approximately onto web based imagery.

GPR is utilized to detect and potentially observe former UST excavation sidewalls as well as septic – leach field pit sidewall and fill areas. GPR is also utilized to compliment the EM Pipe and Cable utility survey work by potentially locating conductive as well as non-conductive utilities.

A EM Pipe and Cable Survey is conducted at each site by performing ambient passive live power and communication line sweeps, active ground induction sweeps, and active direct- connect or induction- clamp sweeps using existing conducts or pipes visibly nearby. Multiple active frequencies are utilized for best Detection. Utilities are identified where possible and marked unknown if not identified.

All observations are marked with hi-visibility orange-red marking paint. Some Ares are hi-lighted with black paint due to light soil conditions. GPR boundaries indicating potential septic tank and leach field areas are outlined with black paint. Pin flags are also utilized to mark these boundaries in soft soil and weed areas.

OBSERVATIONS

Site Description

The Project Site (Holloman AFB - Former UST and Septic Systems) is comprised of approximately 29 different environmental site locations (heir in referred to as Sites) . Each sites includes and varies in description from existing active building locations to in-active remote abandoned to former building areas where USTs or Septic systems were utilized in the past. Each Site is fairly flat with sandy to gravelly surface conditions. Some sites include native brush and weeds. Sites near active building areas include asphalt or concrete surfaces, sidewalks and planter areas. ULS field staff helped review historical documentation available of each site in the field. Where available, drawings and photographs were reviewed. When available, reported GPS coordinates from reports, of septic tank locations, were utilized by SHAW field staff to navigate to septic tank location to aid focus search area.

Generally there are no surface indications of USTS or Septic tanks, however some limited features exist at some sites and include potential vent riser pipes and asphalt patching, settling areas, and conidial – rectangular cracks in concrete. Surface indications of septic systems at some sites include potential inactive clean- outs pipes near building and nearby existing upgraded sewer man-hole systems that have been connected to the existing Base sewer collection system. Some septic system sites have open holes , surface erosion, and associated potential underground voids observed near the inactive cleanouts and suspected septic search area.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

General ambient or background EM conditions at this site are categorized as being high or noisy most likely resulting from caliche or saline soil conditions throughout the area. These conditions all result in a high ambient background EMICD response that are difficult to filter out, however, subtle to distinct lateral changes are observed potentially marking position of former UST excavations. Magnetic locator is not affected by saline conditions. GPR response in these conditions is poor to somewhat fair, however, subtle, trends in GPR observations exhibit dipping or high angle (from horizontal) refraction bands indicating potential soil side-wall trends allowing for location of approximate former excavations. The use of EMICD and GPR data in conjunction with historical information and physical observations are all utilized to mark the approximate location of potential former USTs in the field as shown on the GIS imagery maps.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

Similar response is observed near former septic systems. Most all septic tanks are reported to have been abandoned in place or partly crushed in place. Magnetic locator surveys revealed concentrated areas of metal response (metal anomalies) likely from metal plates and rebar in septic tanks in areas near former sewer clean-outs and next to reported septic tank locations where latitude and longitude data is available. EM Induction and GPR transects over these metal anomalies further corroborated these findings. EM Induction survey results near the effluent (down gradient) side of metal anomalies (potential septic tanks) resulted in observation of relatively moderately higher lateral response to zones of low to quiet lateral response zones near the septic tanks relative to the ambient response in surrounding area. GPR data across these zones exhibited very subtle side-wall trends that appear to corroborate with EMICD findings. The use of EMICD and GPR data in conjunction with historical information and physical observations of cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs in the field and as shown on the GIS imagery maps.

CONCLUSIONS and LIMITATIONS

The use of EMICD and GPR data in conjunction with historical information and physical observations of reported building location, vent riser location, boiler room location, existing and abandoned sewer cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs , Septic tanks and leach fields. Ambient soil conductivity at this site is very high and EM and GPR data observed is very subtle. Field trends are used to mark the approximate location of potential targets.

As in any type of survey or investigation to determine characteristics below grade, careful exploratory excavation or drilling may be needed to further help determine a more accurate determination of the subsurface. Use of hand tools and air knifing is also useful to help as a safety measure. Base one- call utilities, as well as, private 811 one –call should be consulted and recalled as necessary.

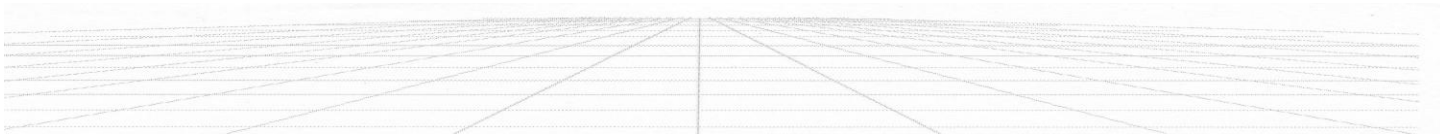
If you have any questions regarding this report please contact me at (206) 384- 2857.

Sincerely,

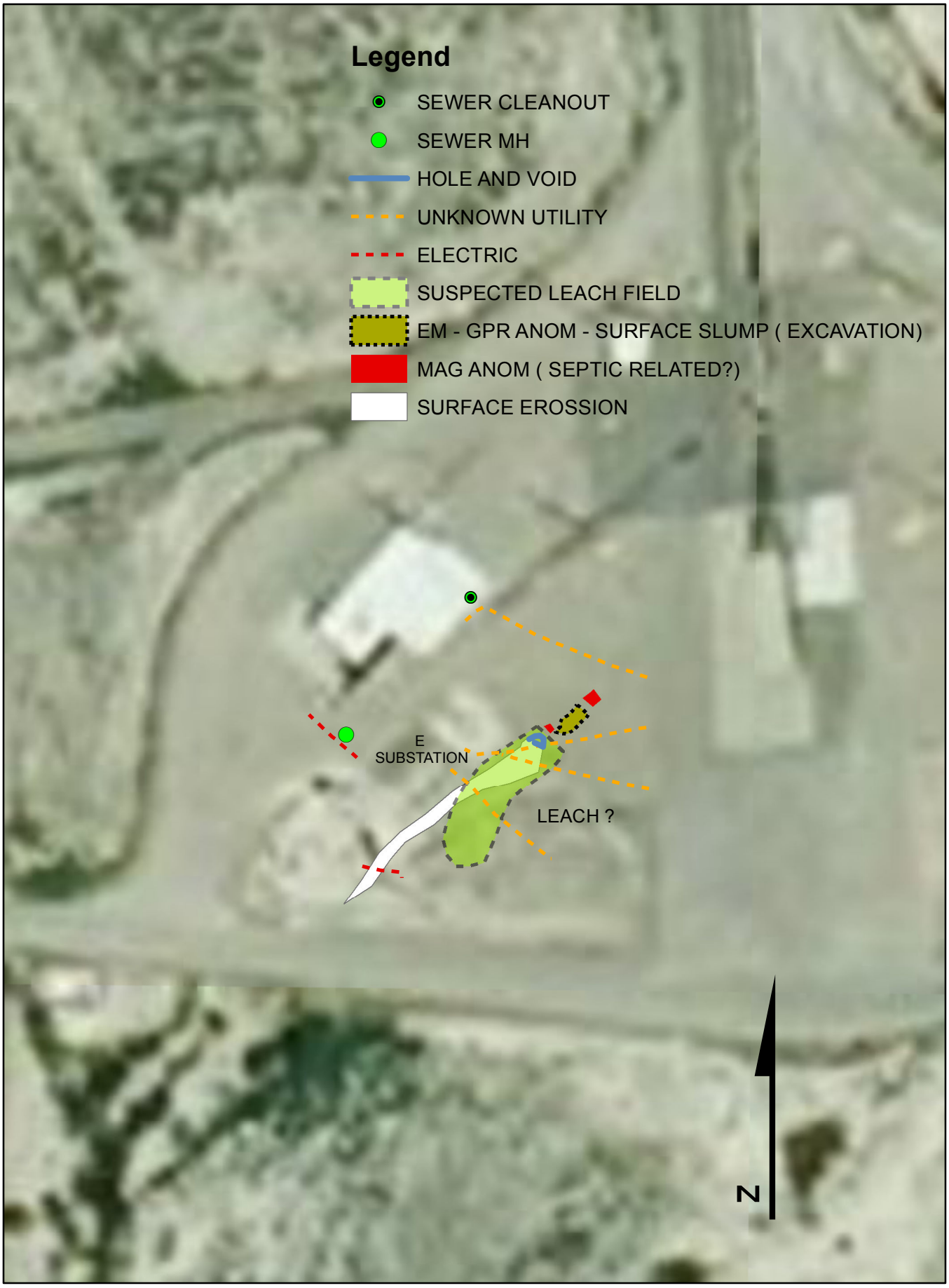
ULS SERVICES CORPORATION
Geomarkout tradename

Michael W. Benedict
Site Representative

Admin Office/Billing: PO Box 724 Pocatello, Idaho 83204
(208) 234-1441 Fax (208) 234-1507 1 800 301-4420
Seattle / Portland / SAC / Alaska / HWI – AS - GUAM Operations
1 - (866) 804- 5734 / San Diego – LA / Operations 1 - (800) 528-8206



BLDG 1175 POTENTIAL SEPTIC SYSTEM
HOLLOMAN AFB



WGS_1984_UTM_Zone_13N
ULS SERVICES CORP
mwb 20 June 2012

0 15 30 60 90 120
Feet

Appendix C
Sample Collection Logs

Sample Collection Log

- Holloman AFB

Manager Christopher Long

Station 1

Location Code OTC543

RFA / COC Number 144106 - Holo

Sample Number OTC543-IS-0001-~~MMDDYY~~ 070512

Task

Sample Name OTC543-z-OTC543-IS-0001-MMDDYY-z

Collection Date ~~0704~~ 070512

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0845

Sample Purpose ~~Unknown~~ Invest.

Start Depth 3"

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 5"

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Preservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) - MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Logged By / Dat Chase Hill 7/5/12

Reviewed By / Dat

Sample Collection Log

Shaw Solutions

- Holloman AFB

Station 1

Manager Christopher Long

Location Code OTC543

RFA / COC Number 144106-H010

Sample Number OTC543-IS-0002-~~MMDDYY~~ 070512

Task

Sample Name OTC543-z-OTC543-IS-0002-MMDDYY-z

Collection Date 070512

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0855

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 12'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Hill 7/5/12 *Reviewed By / Dat* _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager Christopher Long

Station 2

Location Code OTC543

RFA / COC Number 144106 - Holo

Sample Number OTC543-IS-0003-~~MMDDYY~~ 070512

Task

Sample Name OTC543-z-OTC543-IS-0003-MMDDYY-z

Collection Date 070512

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1320

Sample Purpose ~~Unknown~~ Invest.

Start Depth 7'

End Depth 9'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw EMS

Logged By / Dat Chase Hill 7/5/12

Reviewed By / Dat _____

Sample Collection Log

- Holloman AFB

Station 2

Shaw a wholly owned subsidiary of The Shaw Group Inc. Solutions

Manager Christopher Long

Location Code FIELDQC

RFA / COC Number 144106-HO10

Sample Number OTC543-IS-0003-~~MMDDYY~~070512-MS

Task

Sample Name FIELDQC-z-OTC543-IS-0003-MMDDYY-MS-z

Collection Date 070512

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1320

Sample Purpose ~~Unknown~~ Field QC

Start Depth 7'

QC Code LAB MATRIX SPIKE

End Depth 9'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* [signature] 7/5/12 *Reviewed By / Dat* _____

Sample Collection Log

Shaw a CB&I Solutions

- Holloman AFB

Manager Christopher Long

Station 2

Location Code FIELDQC

RFA / COC Number 144106-HOLO

Sample Number OTC543-IS-0003-~~MMDDYY~~-MSD 070512

Task

Sample Name FIELDQC-z-OTC543-IS-0003-MMDDYY-MSD-z

Collection Date 070512

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1320

Sample Purpose ~~Unknown~~ Field QC

Start Depth 7'

End Depth 9'

QC Code LAB MATRIX SPIKE DUPLICATE

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Hill 7/5/12 *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Station 2

Shaw Environmental Solutions

Manager **Christopher Long**

Location Code OTC543

RFA / COC Number 144106 - H010

Sample Number OTC543-IS-0004-~~MMDDYY~~ 070512

Task

Sample Name **OTC543-z-OTC543-IS-0004-MMDDYY-z**

Collection Date 070512

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1340

Sample Purpose ~~Unknown~~ Invest.

Start Depth 14'

End Depth 16'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sampling Equip Geoprobe

Sample Matrix **SOIL**

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: _____

Sketch Location:

Shaw Logged By / Dat Chase Hill 7/5/12 Reviewed By / Dat _____

Sample Collection Log

Shaw Solutions

- Holloman AFB

Station 3

Manager Christopher Long

Location Code OTC543

RFA / COC Number 144106 - H010

Sample Number OTC543-IS-0005-~~MMDDYY~~ 070512

Task

Sample Name OTC543-z-OTC543-IS-0005-MMDDYY-z

Collection Date 070512

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1355

Sample Purpose ~~Unknown~~ invest.

Start Depth 3'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 5'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chad Wm 7/5/12 *Reviewed By / Dat* _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Station 3

Manager **Christopher Long**

Location Code **OTC543**

RFA / COC Number 144106 - H010

Sample Number **OTC543-IS-0006-~~MMDDYY~~** 070512

Task

Sample Name **OTC543-z-OTC543-IS-0006-MMDDYY-z**

Collection Date 070512

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1405

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10'

End Depth 12'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sampling Equip Geoprobe

Sample Matrix **SOIL**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chris Long 7/5/12 *Reviewed By / Dat* _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

Station 4
MW-01

Location Code **OTC543**

RFA / COC Number 144106 - H010

Sample Number **OTC543-IS-0007-~~MMDDYY~~** 070512

Task

Sample Name **OTC543-z-OTC543-IS-0007-MMDDYY-z**

Collection Date 070512

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1415

Sample Purpose ~~Unknown~~ Invest.

Start Depth 3'

End Depth 5'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sampling Equip Geoprobe

Sample Matrix **SOIL**

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase Hill 7/5/12

Reviewed By / Dat

Sample Collection Log

Shaw A world of Solutions

- Holloman AFB

Manager Christopher Long

Station 4
MW-01

Location Code FIELDQC

RFA / COC Number 144106 - H010

Sample Number OTC543-IS-0008-~~MMDD~~YY-FD → 070512

Task

Sample Name FIELDQC-z-OTC543-IS-0008-MMDDYY-FD-z

Collection Date 070512

Sampling Method ~~Unknown~~ → DPT

Sample Type ~~Unknown~~ → Grab

Collection Time ~~10~~ 1430

Sample Purpose ~~Unknown~~ → Field QC

Start Depth ~~12~~ 10'

End Depth 12'

QC Code FIELD DUPLICATE

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase Hill 7/5/12

Reviewed By / Dat

Sample Collection Log

Shaw Solutions

- Holloman AFB

Station 4
MW-01

Manager Christopher Long

Location Code OTC543

RFA / COC Number 144106 - H010

Sample Number OTC543-IS-0009-~~MMDDYY~~ 070512

Task

Sample Name OTC543-z-OTC543-IS-0009-MMDDYY-z

Collection Date 070512

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1430

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 12

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase Hunt 7/5/12

Reviewed By / Dat _____

Sample Collection Log

Shaw Solutions

- Holloman AFB

Manager Christopher Long

Station 4
MW-01

Location Code OTC543

RFA / COC Number 144106 - H010

Sample Number OTC543-IS-0010-~~MMDDYY~~ 070512

Task

Sample Name OTC543-z-OTC543-IS-0010-MMDDYY-z

Collection Date 070512

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1445

Sample Purpose ~~Unknown~~ Invest.

Start Depth 0'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 2'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam _____

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chase Hin 7/5/12 Reviewed By / Dat _____

Sample Collection Log

Shaw Solutions

- Holloman AFB

Manager Christopher Long

Station 4
MW-01

Location Code OTC543

RFA / COC Number 144106-H010

Sample Number OTC543-IS-0011-~~MMDDYY~~ 070512

Task

Sample Name OTC543-z-OTC543-IS-0011-MMDDYY-z

Collection Date 070512

Sampling Method ~~Unknown~~ PPT

Sample Type ~~Unknown~~ Grab

Collection Time 1445

Sample Purpose Unknown (Invest.)

Start Depth 20'

End Depth 22'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat [signature] 7/5/12 Reviewed By / Dat _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

MW-01

Manager **Christopher Long**

Location Code **OTC543** (Bldg 1175) *RFA / COC Number* 144106-A100

Sample Number **OTC543-GW-5431-~~MMDDYY~~ 08/14/12** *Task*

Sample Name **OTC543-z-OTC543-GW-5431-MMDDYY-z** *Collection Date* 08/14/12

Sampling Method ~~Unknown~~ micropurge *Sample Type* ~~Unknown~~ Grab *Collection Time* 1438

Sample Purpose ~~Unknown~~ Invest. *Start Depth* 24'

QC Code **NORMAL ENVIRONMENTAL SAMPL** *End Depth* 24'

Sampling Equip QED Bladder Pump *Sample Matrix* **GROUND WATER**

QC Partners:

(TB) TB-100 *(EB)* _____ *(FB)* _____ *SampleTeam* Chase Hill

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SW8015B : GRO	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	C	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
SW8015B : ORO	D	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015B : DRO	D	Unknown	2	1	L	1 Liter Amber Glass	H2SO4
PCBs by SW8082A	E	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Explosives by SW8330A	F	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Tritium by 906.0 Mod	G	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Mercury by SW7470A	H	Unknown	0	500	ML	500 ml Poly Container	HNO3
Metals by SW6020A	H	Unknown	0	500	ML	500 ml Poly Container	HNO3
Metals by SW6010C	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
Total CN water by 335.4	I	Unknown	1	500	ML	500 ml Poly Container	NaOH
TDS by 160.1	J	Unknown	1	500	ML	500 ml Poly Container	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Hill 08/14/12 *Reviewed By / Dat* _____

Sample Collection Log

Page: ~~19 of 49~~ 1/1

Shaw Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code ~~FIELDQC~~ IDW

RFA / COC Number HO 38

Sample Number ~~OTC644-GW-0441-MMDDYY-FD~~ LDY-IDWD1-090412

Sample Name ~~FIELDQC-2-OTC644-GW-0441-MMDDYY-FD-z~~

Task

Collection Date 09/04/2012

Sampling Method ~~Unknown~~ Composite

Sample Type ~~Unknown~~ Soil

Collection Time 1330

Sample Purpose ~~Unknown~~ IDW characterization

Start Depth NA

QC Code ~~FIELD DUPLICATE~~ NA

End Depth NA

Sampling Equip Stainless steel Trowel/Bowl/Aluminum

Sample Matrix ~~GROUND WATER~~ IDW Soil

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam LaThom, Hodu

Containers:

	Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
1)	VOCs by SW8260C TCLP VOCs	A	Unknown	~~3~~ 1	~~40~~ 8oz	~~ML~~	~~40 ml VOA Vials~~ Glass	~~HCL~~ Cool to 4°C
	~~SW8015B : GRO~~	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
2)	SVOCs by SW8270D TCLP SVOCs / other organics	EB	Unknown	~~2~~ 1	8	x oz	~~1 Liter Amber Glass~~ Glass	Cool to 4°
	~~SW8015B : GRO~~	B	Unknown	0	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~SW8015B : DRO~~	B	Unknown	2	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~PCBs by SW8082A~~ ~~TCLP~~	E	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
	~~Explosives by SW8330A~~	F	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
3)	~~Tritium by 906.0 Mod~~ RCI	C	Unknown	~~2~~ 1	~~1~~ 8oz		~~1 Liter Amber Glass~~ Glass	~~Cool to 4°C~~ Cool to 4°C
4)	Mercury by SW7470A TCLP Mercury	~~F~~ D	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~ oz	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
5)	Metals by SW6020A TCLP Metals	~~H~~ E	Unknown	~~0~~ 1	~~500~~ 8oz	~~ML~~	~~500 ml Poly Container~~ Glass	~~HNO3~~ Cool to 4°C
	~~Metals by SW6010C~~	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
	~~Total CN water by 335.4~~	I	Unknown	1	500	ML	~~500 ml Poly Container~~	NaOH
	~~TDS by 160.1~~	J	Unknown	1	500	ML	500 ml Poly Container	~~Cool to 4°~~

Comments: Composite Soil sample for TCLP analyses of IDW cuttings rolloff at Lay down Yard, 09/04/12

Sketch Location: Rolloff box Composite Sample @ Lay down Yard.

Analyses: TCLP VOCs, TCLP SVOCs, TCLP metals, TCLP Mercury, RCI

LDY = Lay down Yard

~~Shaw~~ *Logged By / Dat* Mel Hall *Reviewed By / Dat* _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code BULK WATER TANK

RFA / COC Number 144106 H070

Sample Number HAFB-IDW-BULK WATER-0001-111612

Task 144106.JM20000

Sample Name HAFB-IDW-BULK WATER-0001-111612

Collection Date 11/16/12

Sampling Method BAILER

Sample Type GRAB

Collection Time 13:00

Sample Purpose CONFIRM IDW

Start Depth N/A

QC Code

End Depth N/A

Sampling Equip DISPOSABLE BAILER

Sample Matrix **WATER**

QC Partners:

(TB) (EB) (FB)

SampleTeam JH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	B	Unknown	4	8	8OZ	Amber Glass	Cool to 4°
SW8015 : ORO	C	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015 : DRO	C	Unknown	1	1	L	1 Liter Amber Glass	H2SO4
Metals by SW6020A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
METALS by SW6020A	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Mercury by SW7470A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Metals by SW6010C	D	Unknown	1	500	ML	500 ml Poly Container	HNO3
	E		1	500	ML	500 ml Poly Cont	Cool to 4°
SW8015 : GRO	F	Unknown	3	40	ML	40 ml VOA Vials	HCL

Comments: SAMPLE COLLECTED FROM BULK WATER STORAGE TANK AFTER ALL WATER DRUMS WERE CONSOLIDATED. SENT BOTH A PRESERVED AND UNPRESERVED 500ML POLY FOR METALS. SPOKE WITH LAB AND THEY SAID TO SEND UNPRESERVED, BUT I THINK MAYBE THEY MADE A MISTAKE.

Sketch Location:

Shaw Logged By / Dat

Reviewed By / Dat

Appendix D
Boring Logs

Boring ID: OT-C543-Station 1

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1175

Date Completed: 7/5/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: C. LaChance

Ground Elevation AMSL (ft):4055.60
Y Coordinate: 685551.4241
X Coordinate: 1671045.8463

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		Sandy SILT (ML); light brown; slightly moist; 60% silt; 40% very fine to fine sand.		Hand auger from 0 - 5 ft. Began drilling on 7/5/12.
					Same as above (0 ft); reddish brown.		
5		OTC543-IS-0001-070512	NR		Same as above (0 ft); white to tan; moist; 70% silt; 30% very fine sand.	ML	
					▽ Same as above (0 ft); very saturated.		Very saturated @ 7 ft.
10		OTC543-IS-0002-070512	NR		Silty SAND (SM); reddish brown; moist; 70% very fine to fine sand; 30% silt.	SM	
					Sandy SILT (ML); white; slightly moist; 70% silt; 30% very fine to fine sand.		
15			NR		Same as above (12 ft); brownish yellow; moist; 60% silt; 10% clay; 30% very fine sand.	ML	
20			NR				Total depth = 20 ft. Reached total depth on 7/5/12.
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 4/22/13 13:59 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C543-Station 2

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1175

Date Completed: 7/5/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: C. LaChance

Ground Elevation AMSL (ft):4055.84
Y Coordinate: 685535.3328
X Coordinate: 1671064.3589

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		Sandy SILT (ML); light brown; slightly moist; nonplastic; 70% silt; 30% very fine to fine sand.	ML	Hand auger from 0 - 5 ft. Began drilling on 7/5/12.
5			NR		Silty SAND (SM); tan to white; moist; nonplastic; 60% very fine to fine sand; 40% silt.	SM	Very saturated @ 7 ft.
		OTC543-IS-0003-070512					
10			NR		Poorly graded SAND with Silt (SP-SM); tan to white; slightly moist; 90% very fine to fine sand; 10% silt.	SP-SM	
					Same as above (0 ft); white; dry.	ML	
15		OTC543-IS-0004-070512	NR		Silty SAND (SM); light brown; slightly moist; 60% very fine to fine sand; 30% silt; 10% clay.	SM	
20			NR				Total depth = 20 ft. Reached total depth on 7/5/12.
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 4/22/13 14:00 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C543-Station 3

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1175

Date Completed: 7/5/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: C. LaChance

Ground Elevation AMSL (ft):4055.33
Y Coordinate: 685528.997
X Coordinate: 1671029.895

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); light brown to tan; moist; low plasticity; 70% silt; 10% clay; 20% very fine to fine sand.	ML	Hand auger from 0 - 5 ft. Began drilling on 7/5/12.
5		OTC543-IS-0005-070512	NR		Same as above (0 ft); reddish brown.		
10					Silty SAND (SM); tan; moist; 60% very fine to medium sand; 40% silt. ▽ Same as above (5 ft); tan to white; dry to slightly moist; 80% very fine to medium sand; 20% silt. Same as above (5 ft); white; 70% very fine to medium sand; 30% silt.	SM	Saturated @ 7 - 7.5 ft.
15		OTC543-IS-0006-070512	NR				Total depth = 15 ft. Reached total depth on 7/5/12.
20			NR				
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 6/6/13 13:08 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C543-Station 4 (OTC543-MW01)

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1175

Date Completed: 7/5/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: C. LaChance

Top of PVC Riser Pipe AMSL (ft): 4055.13
Y Coordinate: 685471.4153
X Coordinate: 1671011.2233

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0		OTC543-IS-0010-070512	NR		Sandy SILT (ML); tan; dry; nonplastic; 70% silt; 30% very fine to medium sand.		Hand auger from 0 - 5 ft. Began drilling on 7/5/12.
					Same as above (0 ft); reddish tan.		
5		OTC543-IS-0007-070512	NR		SILT (ML); tan; slightly moist; 75% silt; 25% very fine to fine sand.	ML	
10		OTC543-IS-0008-070512-FD and OTC543-IS-0009-070512	NR		Poorly graded SAND with Silt (SP-SM); whitish tan; dry to slightly moist; 90% very fine to fine sand; 10% silt.	SP-SM	
15			NR		Silty SAND (SM); grey; moist; low to medium plasticity: 60% very fine to fine sand; 25% silt; 15% clay.	SM	
20					Poorly graded SAND with Silt (SP-SM); white; dry; nonplastic; 90% very fine to fine sand; 10% silt.	SP-SM	@ 19 ft: color change to tan.
		OTC543-IS-0011-070512	NR		▽ Same as above (18 ft); saturated.		Water @ 21 ft.
25			NR		Same as above (18 ft).		@ 23 ft: color change to white.
30							

Boring ID: OT-C543-Station 4 (OTC543-MW01)

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1175

Date Completed: 7/5/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: C. LaChance

Top of PVC Riser Pipe AMSL (ft): 4055.13
Y Coordinate: 685471.4153
X Coordinate: 1671011.2233

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
30			NR		Poorly graded SAND with Silt (SP-SM); white; dry; nonplastic; 90% very fine to fine sand; 10% silt.		Total depth = 30 ft. Reached total depth on 7/5/12.
35							
40							
45							
50							
55							
60							

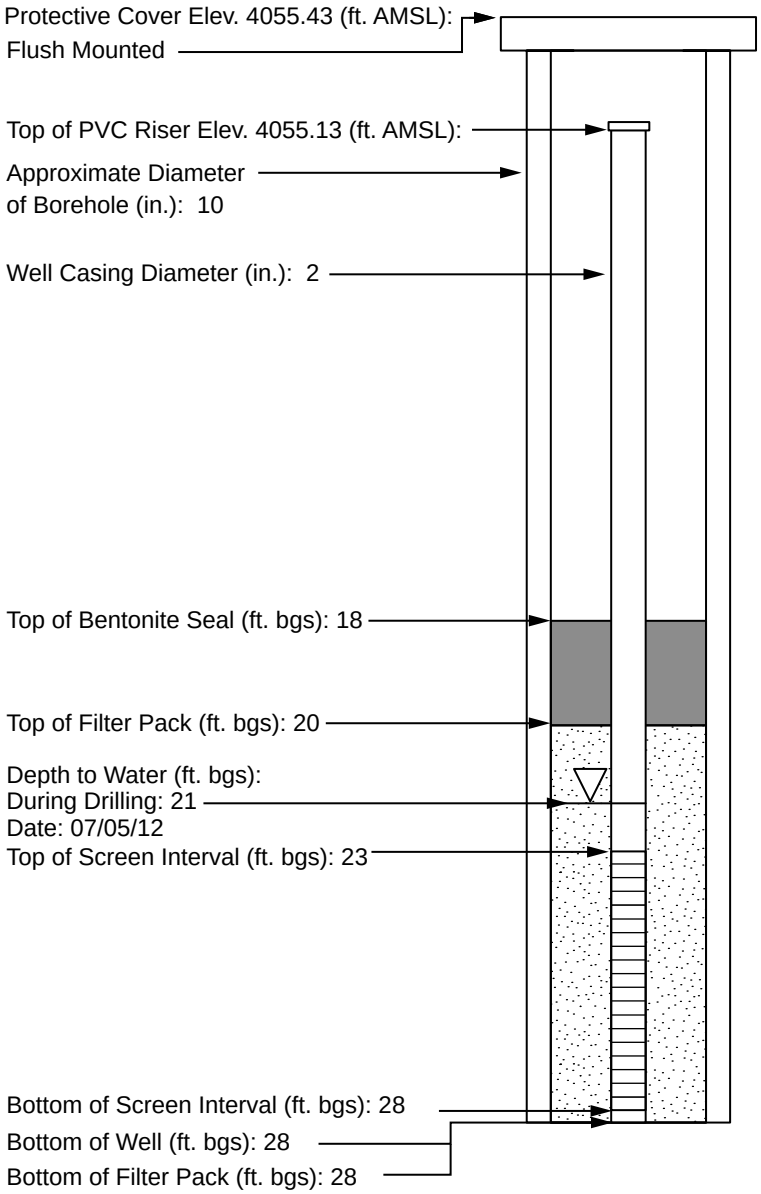
Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-069

Appendix E
Well Construction Diagrams

Well Construction Diagram

Project: Holloman AFB
Location: OT-C543
Client: USAF
Subcontractor: Major Drilling
Driller: K. Burkhead
Drilling Method/Rig Type: DPT/Auger
Shaw Field Representative: C. LaChance

Well Number: OTC543-MW01
Site Location: Building 1175
Installation Date: 07/05/2012
Completion Date: 07/05/2012
Grid Northing: 685471.4153
Grid Easting: 1671011.2233
NAD 83 SPCS NM Central
NAVD 88



Not To Scale

Protective Casing: Circular
- Type: Flush Mount
- Dimensions (in.): 8
- Length (in.): 10
- Guard Post: NA

Ground Seal (Surface pad):
- Dimensions (ft.): 2 x 2
- Type: Concrete

Annular Space Seal:
- Type: QuickCrete & QuickGel Bentonite
- Installation: Gravity

Bentonite Seal:
- Manufacturer: Enviro Plug
- # of Bags: 2 (50 lbs each)
- Type: 3/8" Pellets
- Installation: Gravity
- Hydration time (hrs): 1

Filter Pack Material:
- Manufacturer: DSI
- Product Name: Well Gravel Pack
- Size: GP #3
- # of bags: 3 (50 lbs each)
- Installation: Gravity

Well Casing Used (ft.):
- Manufacturer: Silverline
- Type: PVC Schedule 40
- Diameter (in.): 2

Well Screen Casing:
- Manufacturer: DSI
- Type: 2" Pre-pack w/ vf SS Mesh w/ 1A Sand
- Slot Size (in.): 0.010
- Slot Type: Factory

Sump/End Cap (in.): 4 (PVC)
Backfill Material: NA

Appendix F
Well Purge Records

Shaw® Shaw E & I

EXAMPLE
WELL PURGE RECORD

Project Name: HAFB

Location: OTC543 (Bldg 1175) Well/Piez. No.: _____

Personnel: Chase Hill Date Installed: _____

Date (Start/End): 08/14/12 Csg. Diameter (I.D.): 2"

Method of ~~Development~~: microPurge Total Depth (ft. TOC): _____

☐ Surging ☐ Bailing ☑ Pumping ☐ Other (State Method) _____

☐ Original Development ☐ Redevelopment Development Date: _____

Depth to water ~~before developing well~~: 22.10'

		Volume (V)		Purge Factor		Volume To Purge
Height of Water Column:	_____ feet	_____	=	_____ gal.*	_____	= _____

$V = (B * r_c^2 * L_c * 7.48)+(B*(r_w-r_c)^2*L_s*ø_s*7.48)=$ _____ gallons (See Notes below)

Depth purging from: 24' feet Time purging begins: _____

Weather: sunny 100°F Screened Interval (ft. BGL): _____

Equipment Nos.: pH Meter _____ EC Meter _____ Turbidity Meter _____

Equipment decontaminated prior to development Y _____ N _____

Describe YSI 6820 #36920

Date	Time	Water Level (ft. below TOC)	Volume Removed (gal.)	Temp (C or F)	pH	~~EC~~ Cond.	Turbidity	D.O. mg/L	~~Comments~~ ORP	TDS g/L
08/14/12	1426	23.60	0	27.77	7.47	6.397	16.6	4.90	-6.6	4.151
"	1431	23.55	1.0	27.49	7.43	6.165	21.4	5.19	41.5	4.011
"	1436	23.60	2.0	27.50	7.43	6.221	20.7	5.57	52.2	4.051
	1438	SAMPLED								

Notes:

- Water levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to 0.1 pH units
- Electrical conductivity (EC) – Reported to the nearest 10% mhos/cm or
- µmho/cm @25 C or in mS/cm of instrument set range
- Water temperature – Reported to the nearest 0.1 C or F
- feet
- Dissolved oxygen (D.O.) report in 0.1 mg/L
- Turbidity report in NTV nearest whole #

Where:

B=3.14

$ø_s$=porosity of the sand pack

r_c =radius of the well casing and screen in feet

L_c=length of water column inside the casing and screen in feet

r_w =radius of the well bore in feet

L_s =length of saturated portion of the sand pack in feet

7.48 gallons/cubic foot=conversion from cubic feet to gallons

Appendix G
Site Survey Data

Revised Rpt
09/11/2013
(re: TU/US-C513)
p. 7 of 10

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	682987.8550	1687022.9920	4098.16	BASE	682789.9107	1686534.0572
2	678390.1010	1678735.5020	4064.77	CP-52-P-19	678193.4892	1678248.9690
3	683252.1480	1680789.5360	4078.80	CP-55-JACK	683054.1271	1680302.4077
4	681667.1260	1694574.3780	4140.57	CP-56-AIR	681469.5645	1694083.2546
5	669733.4460	1682234.2110	4048.59	HAFB-07-07	669539.3431	1681746.6640
6	669695.2030	1718768.4150	4157.95	ALAMOAIR	669501.1112	1718270.2797
7	674362.7100	1713591.4300	4160.17	F248	674167.2655	1713094.7951
8	676850.6600	1718114.2590	4193.99	E-248	676654.4944	1717616.3133
50	691964.7620	1687201.2770	4140.90	MALONE	691764.2160	1686712.2905
51	662077.1700	1670356.4250	4077.10	BATE	661885.2861	1669872.3205
52	678390.1080	1678735.5040	4066.10	P 19	678193.4962	1678248.9710
53	644127.0780	1700529.8000	4039.00	MONT	643940.3964	1700036.9506
54	676850.6920	1718114.2670	4193.99	E 248	676654.5264	1717616.3213
55	683252.1970	1680789.5390	4080.20	JACK	683054.1761	1680302.4107
56	681667.0380	1694574.3640	4141.20	AIR	681469.4765	1694083.2406
82	678193.4999	1678248.9801	4064.92	P	677996.9451	1677762.5882
84	676654.5300	1717616.3305	4192.77	E	676458.4212	1717118.5291
85	683054.1798	1680302.4198	4079.02	JACK	682856.2163	1679815.4327
86	681469.4802	1694083.2497	4140.00	AIR	681271.9760	1693592.2686
100	685975.0760	1686614.9100	4101.87	OT-C534-PVC	685776.2660	1686126.0934
101	685975.4260	1686614.8310	4102.28	OT-C534-CASING	685776.6159	1686126.0145
102	685952.4860	1686626.9650	4101.89	OT-C534-W2-PVC	685753.6825	1686138.1449
103	685952.6870	1686626.9300	4102.33	OT-C534-W2-CASING	685753.8834	1686138.1099
104	685939.9110	1686581.7340	4101.89	OT-C534-W1-CASING	685741.1111	1686092.9270
105	685939.6450	1686581.7790	4101.57	OT-C534-W1-PVC	685740.8452	1686092.9720
106	685924.3640	1686619.9800	4101.81	OT-C534-W4-PVC	685725.5687	1686131.1620
107	685924.6590	1686619.8790	4102.23	OT-C534-W4-CASING	685725.8636	1686131.0610
108	685934.1180	1686578.3320	4101.72	OT-C534-LEACH-NG	685735.3198	1686089.5260
109	685935.7830	1686600.7340	4101.88	OT-C534-LEACH-NG	685736.9843	1686111.9215
110	685938.2680	1686607.0980	4101.88	OT-C534-LEACH-NG	685739.4686	1686118.2837
111	685951.4240	1686604.4600	4101.90	OT-C534-LEACH-NG	685752.6208	1686115.6465
112	685953.8200	1686601.1380	4101.88	OT-C534-LEACH-NG	685755.0161	1686112.3254
113	685953.2500	1686596.8650	4101.88	OT-C534-LEACH-NG	685754.4463	1686108.0537
114	685946.2830	1686578.3790	4101.81	OT-C534-LEACH-NG	685747.4813	1686089.5730
115	685945.3070	1686576.3400	4101.88	OT-C534-LEACH-NG	685746.5056	1686087.5346
116	685940.6850	1686575.6580	4101.79	OT-C534-LEACH-NG	685741.8849	1686086.8528
117	685952.3510	1686614.8200	4102.03	OT-C534-LEACH-NG	685753.5475	1686126.0035
118	685953.0040	1686623.0300	4102.13	OT-C534-LEACH-NG	685754.2004	1686134.2111
119	685945.6920	1686623.1960	4102.03	OT-C534-LEACH-NG	685746.8905	1686134.3770
120	685944.8810	1686615.5440	4101.97	OT-C534-LEACH-NG	685746.0797	1686126.7272
121	685948.0570	1686615.1700	4101.97	OT-C534-FLINE-NG	685749.2548	1686126.3534
122	685947.7680	1686606.3420	4101.81	OT-C534-FLINE-NG	685748.9659	1686117.5279
123	685953.2050	1686618.0690	4102.08	OT-C534-ENFLU-NG	685754.4013	1686129.2515
124	685968.5800	1686611.5870	4102.06	OT-C534-ENFLU-NG	685769.7718	1686122.7714
125	686021.5760	1686604.3860	4102.49	OT-C534-ENFLU-NG	685822.7525	1686115.5725
126	686051.0660	1686600.5520	4102.82	OT-C534-ENFLU-NG	685852.2339	1686111.7396
127	682943.9250	1686529.5770	4094.74	OT-C536-STATION1-NG	682745.9934	1686040.7852
128	682925.1900	1686534.9010	4094.63	OT-C536-STATION2-NG	682727.2639	1686046.1076
129	682914.0740	1686530.8350	4094.17	OT-C536-STATION3-NG	682716.1511	1686042.0428
130	682900.2750	1686534.1950	4094.40	MW-OT-C5361-CASING	682702.3561	1686045.4018
131	682900.0410	1686534.2560	4094.03	MW-OT-C5361-PVC	682702.1222	1686045.4628
132	682892.0960	1686514.3610	4094.08	OT-C536-LEACH-NG	682694.1795	1686025.5736
133	682905.9860	1686504.4840	4093.98	OT-C536-LEACH-NG	682708.0654	1686015.6994
134	682914.9460	1686505.2970	4094.10	OT-C536-LEACH-NG	682717.0228	1686016.5122
135	682919.4610	1686521.1490	4094.40	OT-C536-LEACH-NG	682721.5365	1686032.3596
136	682921.1340	1686534.7310	4094.42	OT-C536-LEACH-NG	682723.2091	1686045.9377
137	682919.5910	1686545.0230	4094.72	OT-C536-LEACH-NG	682721.6665	1686056.2267
138	682912.1700	1686551.2270	4094.60	OT-C536-LEACH-NG	682714.2477	1686062.4289
139	682897.7180	1686551.9240	4094.16	OT-C536-LEACH-NG	682699.7998	1686063.1257
140	682892.5110	1686549.8820	4094.18	OT-C536-LEACH-NG	682694.5943	1686061.0843
141	682922.3680	1686533.4440	4094.42	OT-C536-TANKPIT-NG	682724.4427	1686044.6510
142	682920.9800	1686525.5880	4094.39	OT-C536-TANKPIT-NG	682723.0551	1686036.7973
143	682928.0220	1686524.4280	4094.63	OT-C536-TANKPIT-NG	682730.0951	1686035.6377
144	682929.2370	1686532.7090	4094.62	OT-C536-TANKPIT-NG	682731.3097	1686043.9163
145	682949.7020	1686528.9800	4094.75	OT-C536-ENFLU-NG	682751.7688	1686040.1883
146	682921.2900	1686528.9090	4094.41	OT-C536-ENFLU-NG	682723.3650	1686040.1174
147	682916.2970	1686530.1310	4094.27	OT-C536-ENFLU-NG	682718.3735	1686041.3390
148	682877.6850	1686739.3620	4095.03	OT-C533-MW-CASING	682679.7726	1686250.5094
149	682877.4490	1686739.4350	4094.68	OT-C533-MW-PVC	682679.5367	1686250.5823
150	682884.2550	1686735.8390	4094.76	OT-C533-LEACH-NG	682686.3407	1686246.9874
151	682877.4700	1686734.1690	4094.84	OT-C533-LEACH-NG	682679.5577	1686245.3179

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
152	682871.6400	1686736.6530	4094.83	OT-C533-LEACH-NG	682673.7294	1686247.8011
153	682869.4200	1686738.9370	4094.89	OT-C533-LEACH-NG	682671.5100	1686250.0845
154	682868.8760	1686741.4810	4094.99	OT-C533-LEACH-NG	682670.9662	1686252.6277
155	682867.8710	1686756.1100	4095.03	OT-C533-LEACH-NG	682669.9615	1686267.2525
156	682857.6950	1686766.0680	4095.35	OT-C533-LEACH-NG	682659.7884	1686277.2076
157	682855.8760	1686772.9280	4095.39	OT-C533-LEACH-NG	682657.9700	1686284.0656
158	682855.6590	1686783.4130	4095.46	OT-C533-LEACH-NG	682657.7530	1686294.5476
159	682855.5230	1686790.0690	4095.47	OT-C533-LEACH-NG	682657.6171	1686301.2017
160	682857.2270	1686794.8730	4095.42	OT-C533-LEACH-NG	682659.3206	1686306.0043
161	682858.6900	1686813.7880	4095.55	OT-C533-LEACH-NG	682660.7832	1686324.9138
162	682867.9360	1686816.7350	4095.32	OT-C533-LEACH-NG	682670.0265	1686327.8599
163	682880.0660	1686814.6740	4095.00	OT-C533-LEACH-NG	682682.1530	1686325.7995
164	682891.9700	1686818.7840	4094.82	OT-C533-LEACH-NG	682694.0535	1686329.9083
165	682901.1340	1686806.7570	4094.86	OT-C533-LEACH-NG	682703.2148	1686317.8848
166	682889.7110	1686785.0140	4094.98	OT-C533-LEACH-NG	682691.7952	1686296.1481
167	682889.3190	1686757.8750	4094.96	OT-C533-LEACH-NG	682691.4033	1686269.0170
168	682886.6550	1686745.7080	4094.83	OT-C533-LEACH-NG	682688.7400	1686256.8535
169	682895.8900	1686814.7130	4095.19	OT-C533-FFLUEN-NG	682697.9724	1686325.8385
170	682901.8890	1686814.2530	4095.86	OT-C533-FFLUEN-TPAD	682703.9696	1686325.3787
171	682901.5970	1686811.8220	4095.84	OT-C533-SEPTIC-TCONC	682703.6777	1686322.9484
172	682911.5820	1686810.3750	4095.77	OT-C533-SEPTIC-TCONC	682713.6598	1686321.5018
173	682912.4280	1686815.4170	4095.77	OT-C533-SEPTIC-TCONC	682714.5056	1686326.5423
174	682902.3730	1686816.8390	4095.84	OT-C533-SEPTIC-TCONC	682704.4535	1686327.9639
175	682912.0910	1686812.7560	4095.77	OT-C533-EFLUEN-TCONC	682714.1687	1686323.8821
176	682923.3600	1686810.9450	4095.29	OT-C533-EFLUEN-NG	682725.4344	1686322.0716
177	682942.2940	1686810.3140	4095.49	OT-C533-EFLUEN-NG	682744.3629	1686321.4408
178	682937.5080	1686805.9000	4095.30	OT-C533-STATION1-NG	682739.5783	1686318.0278
179	682906.2780	1686808.8380	4094.86	OT-C533-STATION2-NG	682708.3574	1686319.9652
180	682895.2770	1686813.2080	4094.98	OT-C533-STATION3-NG	682697.3595	1686324.3340
181	700191.9570	1695605.3730	4181.72	OT-C540-STATION1-ASP	699989.0266	1695113.9508
182	700173.9260	1695611.2520	4181.82	OT-C540-STATION2-NG	699971.0008	1695119.8281
183	700168.8930	1695604.5390	4181.39	OT-C540-STATION3-NG	699965.9693	1695113.1170
184	700151.2700	1695598.6630	4180.49	OT-C540-STATION4-NG	699948.3514	1695107.2427
185	700158.9630	1695593.9090	4180.86	OT-C540-LEACH-NG	699956.0422	1695102.4901
186	700150.2560	1695603.0840	4180.78	OT-C540-LEACH-NG	699947.3377	1695111.6625
187	700152.8330	1695609.6400	4180.81	OT-C540-LEACH-NG	699949.9139	1695118.2166
188	700155.1660	1695611.7200	4180.89	OT-C540-LEACH-NG	699952.2463	1695120.2960
189	700161.1020	1695611.3470	4181.11	OT-C540-LEACH-NG	699958.1805	1695119.9231
190	700163.7200	1695601.1600	4181.06	OT-C540-LEACH-NG	699960.7978	1695109.7390
191	700161.5790	1695596.1920	4181.05	OT-C540-LEACH-NG	699958.6574	1695104.7725
192	700165.7400	1695603.7570	4181.48	OT-C540-FFLUEN-NG	699962.8172	1695112.3353
193	700170.8520	1695608.8530	4181.93	OT-C540-FFLUEN-NG	699967.9277	1695117.4298
194	700170.7290	1695606.7600	4182.01	OT-C540-SEPTIC-NG	699967.8048	1695115.3374
195	700176.8760	1695605.4490	4181.91	OT-C540-SEPTIC-NG	699973.9500	1695114.0268
196	700177.5910	1695612.4300	4181.92	OT-C540-SEPTIC-NG	699974.6648	1695121.0058
197	700172.1930	1695613.9030	4182.05	OT-C540-SEPTIC-NG	699969.2683	1695122.4783
198	700177.7030	1695608.9790	4181.69	OT-C540-EFLUEN-NG	699974.7767	1695117.5558
199	700205.8220	1695608.1850	4181.85	OT-C540-EFLUEN-ASPH	700002.8876	1695116.7620
200	700246.4300	1695613.4690	4182.95	OT-C540-EFLUEN-ASPH	700043.4838	1695122.0445
201	700238.4930	1695614.0360	4182.51	OT-C540-BLDGCOR	700035.5491	1695122.6113
202	700228.4390	1695608.1640	4182.55	OT-C540-BLDGCOR	700025.4980	1695116.7410
203	700227.0510	1695568.0300	4182.87	OT-C540-BLDGCOR	700024.1104	1695076.6186
204	700236.9380	1695557.6950	4183.02	OT-C540-BLDGCOR	700033.9946	1695066.2866
205	688305.7410	1690609.5510	4126.46	TU\US-C507-STATION1-	688106.2555	1690119.5767
206	688309.7220	1690614.0760	4126.51	TU\US-C507-STATION2-	688110.2353	1690124.1004
207	688306.7130	1690619.4150	4126.45	TU\US-C507-STATION3-	688107.2272	1690129.4378
208	688313.7000	1690621.8280	4126.37	TU\US-C507-STATION4-	688114.2122	1690131.8501
209	688313.7950	1690607.6410	4126.36	TU\US-C507-STATION5-	688114.3071	1690117.6673
210	688304.0140	1690620.9730	4126.47	TU\US-C507-USTPIT-AS	688104.5290	1690130.9954
211	688304.3040	1690607.3010	4126.54	TU\US-C507-USTPIT-AS	688104.8189	1690117.3274
212	688317.4320	1690607.1780	4126.54	TU\US-C507-USTPIT-AS	688117.9431	1690117.2044
213	688317.6000	1690622.2860	4126.57	TU\US-C507-USTPIT-AS	688118.1110	1690132.3080
214	688320.7590	1690623.9670	4127.18	TU\US-C507-BLDGCOR	688121.2691	1690133.9885
215	688330.7630	1690627.7570	4125.65	TU\US-C507-BLDGCOR	688131.2702	1690137.7774
216	688318.5520	1690598.7120	4126.71	TU\US-C507-BLDGCOR	688119.0628	1690108.7408
217	688306.5580	1690598.9520	4126.69	TU\US-C507-BLDGCOR	688107.0722	1690108.9808
218	688287.5740	1690592.3200	4126.83	TU\US-C507-EXMW1	688088.0937	1690102.3507
219	688287.4600	1690625.9270	4126.36	TU\US-C507-EXMW2	688087.9798	1690135.9480
220	689216.8690	1680453.8850	4087.76	TU\US-C501-STATION4-	689017.1194	1679966.8540
221	689203.4000	1680450.4300	4087.80	TU\US-C501-STATION1-	689003.6543	1679963.4000
222	689227.9170	1680449.2880	4087.78	TU\US-C501-STATION2-	689028.1642	1679962.2584

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
223	689201.2820	1680437.6020	4087.96	TU\US-C501-STATION3-	689001.5369	1679950.5757
224	689204.0090	1680426.7550	4087.80	TU\US-C501-STATION5-	689004.2631	1679939.7319
225	689200.5240	1680440.6650	4087.95	TU\US-C501-BLDGCOR-N	689000.7792	1679953.6379
226	689191.1430	1680432.8740	4088.07	TU\US-C501-BLDGCOR-N	688991.4009	1679945.8491
227	689202.0960	1680449.8730	4087.79	TU\US-C501-TANKPIT-N	689002.3507	1679962.8432
228	689201.5860	1680440.8210	4087.99	TU\US-C501-TANKPIT-N	689001.8408	1679953.7938
229	689191.7450	1680432.9310	4088.07	TU\US-C501-TANKPIT-N	688992.0027	1679945.9061
230	689195.4710	1680423.1750	4087.88	TU\US-C501-TANKPIT-N	688995.7276	1679936.1529
231	689207.1960	1680422.4490	4087.92	TU\US-C501-TANKPIT-N	689007.4492	1679935.4271
232	689229.2900	1680431.3210	4087.77	TU\US-C501-TANKPIT-N	689029.5368	1679944.2966
233	689231.6150	1680444.1310	4087.67	TU\US-C501-TANKPIT-N	689031.8611	1679957.1029
234	689227.5450	1680454.7320	4087.83	TU\US-C501-TANKPIT-N	689027.7923	1679967.7008
235	689218.0540	1680463.3780	4088.03	TU\US-C501-TANKPIT-N	689018.3041	1679976.3443
236	689209.0460	1680458.6260	4087.92	TU\US-C501-TANKPIT-N	689009.2987	1679971.5937
237	689237.1630	1680445.1670	4087.64	TU\US-C501-COMMLINE-	689037.4075	1679958.1386
238	689219.6050	1680436.9770	4088.00	TU\US-C501-COMMLINE-	689019.8546	1679949.9509
239	689199.7540	1680431.6770	4088.06	TU\US-C501-COMMLINE-	689000.0094	1679944.6525
240	689181.3550	1680425.0490	4088.20	TU\US-C501-COMMLINE-	688981.6157	1679938.0264
241	689162.6180	1680417.3900	4088.35	TU\US-C501-COMMLINE-	688962.8841	1679930.3696
242	689161.5970	1680417.5650	4088.56	TU\US-C501-COMMVAULT	688961.8634	1679930.5446
243	689157.8580	1680421.3400	4088.11	TU\US-C501-COMMVAULT	688958.1255	1679934.3185
244	689150.8680	1680414.5760	4088.10	TU\US-C501-COMMVAULT	688951.1375	1679927.5564
245	689154.6050	1680410.8830	4088.46	TU\US-C501-COMMVAULT	688954.8735	1679923.8645
246	687246.6430	1686873.0010	4105.82	OT-C535-STATION1-NG	687047.4644	1686384.1096
247	687270.5400	1686861.6690	4105.63	OT-C535-STATION2-NG	687071.3545	1686372.7809
248	687282.8340	1686866.7860	4105.85	OT-C535-STATION3-NG	687083.6449	1686377.8964
249	687303.5940	1686788.5490	4105.12	OT-C535-STATION4-NG	687104.3989	1686299.6821
250	687291.9640	1686793.7970	4105.27	OT-C535-LEACH-NG	687092.7723	1686304.9286
251	687304.7930	1686782.8770	4105.17	OT-C535-LEACH-NG	687105.5976	1686294.0117
252	687323.6740	1686798.1880	4105.34	OT-C535-LEACH-NG	687124.4731	1686309.3183
253	687319.7080	1686817.5380	4105.82	OT-C535-LEACH-NG	687120.5083	1686328.6627
254	687307.4400	1686838.9610	4105.76	OT-C535-LEACH-NG	687108.2438	1686350.0795
255	687297.0830	1686856.5380	4106.04	OT-C535-LEACH-NG	687097.8898	1686367.6514
256	687290.0540	1686837.9200	4105.59	OT-C535-LEACH-NG	687090.8628	1686349.0388
257	687291.3760	1686806.0200	4105.33	OT-C535-LEACH-NG	687092.1845	1686317.1480
258	687284.5890	1686864.5150	4106.11	OT-C535-FFLUEN-NG	687085.3994	1686375.6261
259	687276.8290	1686868.4490	4106.19	OT-C535-FFLUEN-NG	687077.6417	1686379.5589
260	687276.0820	1686870.8490	4106.28	OT-C535-SEPTIC-NG	687076.8949	1686381.9583
261	687263.3720	1686869.7190	4105.87	OT-C535-SEPTIC-NG	687064.1886	1686380.8286
262	687263.7200	1686863.5770	4105.95	OT-C535-SEPTIC-NG	687064.5365	1686374.6884
263	687276.4840	1686862.8870	4106.07	OT-C535-SEPTIC-NG	687077.2968	1686373.9986
264	687263.5270	1686868.1150	4105.92	OT-C535-EFLUEN-NG	687064.3435	1686379.2250
265	687228.9570	1686874.1570	4105.71	OT-C535-EFLUEN-NG	687029.7836	1686385.2653
266	687235.2230	1686881.4610	4106.05	OT-C535-BLDGCOR-NG	687036.0477	1686392.5672
267	687225.9150	1686892.3360	4105.90	OT-C535-BLDGCOR-NG	687026.7424	1686403.4390
268	687232.0250	1686844.5370	4105.92	OT-C535-BLDGCOR-NG	687032.8507	1686355.6539
269	687221.4890	1686835.3400	4105.63	OT-C535-BLDGCOR-NG	687022.3177	1686346.4595
270	677637.2460	1692755.6660	4110.24	TU/US-C505-MW1-CASIN	677440.8524	1692265.0697
271	677636.9990	1692755.6590	4109.84	TU/US-C505-MW1-PVC	677440.6055	1692265.0627
272	677634.4160	1692722.3930	4110.42	TU/US-C505-WELLATEMP	677438.0233	1692231.8064
273	677659.4620	1692742.2400	4110.34	TU/US-C505-WELLATEMP	677463.0620	1692251.6476
274	677701.9500	1692799.3200	4110.17	TU/US-C505-USTPIT-NG	677505.5377	1692308.7111
275	677701.3830	1692789.3010	4110.35	TU/US-C505-USTPIT-NG	677504.9708	1692298.6950
276	677711.5570	1692789.5280	4110.64	TU/US-C505-USTPIT-NG	677515.1419	1692298.9219
277	677710.8940	1692799.1130	4110.24	TU/US-C505-USTPIT-NG	677514.4791	1692308.5041
278	677707.4060	1692790.0820	4110.35	TU/US-C505-STATION1-	677510.9921	1692299.4757
279	677702.3100	1692795.0710	4110.20	TU/US-C505-STATION2-	677505.8976	1692304.4633
280	677705.6610	1692797.9500	4110.13	TU/US-C505-STATION3-	677509.2476	1692307.3415
281	677710.4770	1692793.8740	4110.09	TU/US-C505-STATION4-	677514.0622	1692303.2666
282	677706.4200	1692793.8350	4110.12	TU/US-C505-STATION5-	677510.0064	1692303.2276
283	677694.5060	1692779.7220	4110.88	TU/US-C505-BLDGCOR-N	677498.0958	1692289.1187
284	677704.1940	1692790.4680	4110.28	TU/US-C505-BLDGCOR-N	677507.7810	1692299.8616
285	677754.5670	1692783.0890	4110.79	TU/US-C505-BLDGCOR-N	677558.1394	1692292.4848
286	677743.8570	1692795.1680	4110.70	TU/US-C505-BLDGCOR-N	677547.4325	1692304.5603
287	686300.2320	1672933.0350	4060.98	OT-C542-MW-CASING-	686101.3277	1672448.1837
288	686300.2350	1672933.0550	4060.98	OT-C542-MW-PVC	686101.3307	1672448.2037
289	686274.4020	1672914.6520	4061.01	OT-C542-LEACH-NG	686075.5052	1672429.8061
290	686289.6710	1672938.5250	4060.76	OT-C542-LEACH-NG	686090.7698	1672453.6721
291	686294.6900	1672941.1720	4060.83	OT-C542-LEACH-NG	686095.7873	1672456.3184
292	686301.6970	1672938.9490	4060.85	OT-C542-LEACH-NG	686102.7923	1672454.0960
293	686305.7170	1672936.2850	4060.87	OT-C542-LEACH-NG	686106.8111	1672451.4328

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
294	686308.0670	1672931.0550	4060.89	OT-C542-LEACH-NG	686109.1604	1672446.2043
295	686304.8000	1672917.9090	4060.82	OT-C542-LEACH-NG	686105.8944	1672433.0621
296	686292.3740	1672901.2590	4060.90	OT-C542-LEACH-NG	686093.4720	1672416.4169
297	686283.4190	1672906.7050	4060.97	OT-C542-FFLUEN-NG	686084.5196	1672421.8614
298	686280.3770	1672902.6520	4060.94	OT-C542-FFLUEN-NG	686081.4785	1672417.8095
299	686276.9070	1672904.6420	4060.95	OT-C542-SEPTIC-NG	686078.0095	1672419.7990
300	686271.2980	1672896.9550	4060.80	OT-C542-SEPTIC-NG	686072.4021	1672412.1142
301	686281.9530	1672889.9350	4060.83	OT-C542-SEPTIC-NG	686083.0540	1672405.0962
302	686287.0950	1672896.6800	4060.88	OT-C542-SEPTIC-NG	686088.1945	1672411.8393
303	686285.7900	1672894.7150	4060.83	OT-C542-EFLUEN-NG	686086.8899	1672409.8748
304	686299.2270	1672887.1560	4060.87	OT-C542-EFLUEN-NG	686100.3230	1672402.3180
305	686310.9860	1672881.5880	4061.18	OT-C542-EFLUEN-NG	686112.0786	1672396.7516
306	686294.2970	1672858.0380	4060.90	OT-C542-BLDGCOR-NG	686095.3944	1672373.2085
307	686295.8820	1672844.1310	4061.28	OT-C542-BLDGCOR-NG	686096.9790	1672359.3055
308	686345.1390	1672922.4560	4060.89	OT-C542-BLDGCOR-NG	686146.2217	1672437.6078
309	686358.9780	1672924.0940	4061.42	OT-C542-BLDGCOR-NG	686160.0567	1672439.2453
310	686291.8860	1672885.1500	4060.65	OT-C542-STATION1-NG	686092.9841	1672400.3126
311	686275.2730	1672891.5340	4060.63	OT-C542-STATION2-NG	686076.3760	1672406.6948
312	686281.5390	1672904.6340	4060.73	OT-C542-STATION2-NG	686082.6401	1672419.7910
313	685750.1690	1671530.2910	4055.60	OT-C543-STATION2-NG	685551.4241	1671045.8463
314	685734.0730	1671548.8090	4055.84	OT-C543-STATION2	685535.3328	1671064.3589
315	685727.7350	1671514.3350	4055.33	OT-C543-STATION3	685528.9966	1671029.8949
316	685749.4390	1671546.6740	4055.91	OT-C543-EXSEPTIC	685550.6944	1671062.2245
317	685732.6430	1671545.5190	4055.74	OT-C543-EXSEPTIC	685533.9032	1671061.0699
318	685741.2600	1671557.0720	4056.32	OT-C543-EXSEPTIC	685542.5177	1671072.6195
319	685738.1510	1671537.7290	4055.62	OT-C543-EXSEPTIC	685539.4096	1671053.2821
320	685734.3520	1671541.2760	4055.65	OT-C543-FFLUEN	685535.6117	1671056.8281
321	685716.0920	1671515.5090	4055.04	OT-C543-FFLUEN	685517.3570	1671031.0686
322	685708.2650	1671520.5800	4055.23	OT-C543-LEACH	685509.5323	1671036.1381
323	685688.3040	1671512.0560	4055.52	OT-C543-LEACH	685489.5771	1671027.6166
324	685669.5610	1671502.3840	4055.36	OT-C543-LEACH	685470.8395	1671017.9474
325	685659.9210	1671495.2130	4055.04	OT-C543-LEACH	685461.2023	1671010.7784
326	685670.4020	1671495.5660	4055.43	OT-C543-MW-CASING	685471.6803	1671011.1313
327	685670.1370	1671495.6580	4055.13	OT-C543-MW-PVC	685471.4153	1671011.2233
328	685682.2550	1671485.7460	4055.16	OT-C543-LEACH	685483.5298	1671001.3142
329	685699.8070	1671491.2750	4054.76	OT-C543-LEACH	685501.0767	1671006.8416
330	685710.4840	1671499.0550	4055.06	OT-C543-LEACH	685511.7506	1671014.6193
331	685721.5030	1671508.4730	4055.40	OT-C543-LEACH	685522.7664	1671024.0346
332	685794.8190	1671498.3320	4056.84	OT-C543-EFLUEN	685596.0612	1671013.8965
333	685809.3600	1671495.0820	4059.27	OT-C543-BLDGCOR	685610.5980	1671010.6475
334	685776.9050	1671465.9090	4060.02	OT-C543-BLDGCOR	685578.1524	1670981.4829
335	685785.4230	1671455.8900	4060.26	OT-C543-BLDGCOR	685586.6679	1670971.4668
336	685744.8400	1671542.1950	4055.76	OT-C543-EFLUEN	685546.0967	1671057.7468
337	685303.6520	1671072.3550	4048.79	OT-C544-MW-CASING	685105.0365	1670588.0430
338	685303.3550	1671072.2840	4048.52	OT-C544-MW-PVC	685104.7396	1670587.9720
339	685349.4970	1671083.9730	4052.43	OT-C544-STATION1	685150.8683	1670599.6576
340	685342.4960	1671086.5980	4051.55	OT-C544-STATION1	685143.8693	1670602.2819
341	685336.0530	1671085.0120	4050.99	OT-C544-STATION1	685137.4282	1670600.6963
342	685336.7000	1671089.5480	4051.15	OT-C544-SEPTIC	685138.0750	1670605.2310
343	685338.4520	1671075.7050	4051.30	OT-C544-SEPTIC	685139.8265	1670591.3920
344	685347.8050	1671077.3720	4052.23	OT-C544-SEPTIC	685149.1768	1670593.0585
345	685345.6600	1671089.9410	4052.38	OT-C544-SEPTIC	685147.0324	1670605.6239
346	685356.1020	1671079.9660	4041.22	OT-C544-EFLUEN	685157.4713	1670595.6518
347	685347.2700	1671081.8770	4052.36	OT-C544-EFLUEN	685148.6419	1670597.5622
348	685337.4940	1671082.4320	4051.31	OT-C544-FFLUEN	685138.8687	1670598.1171
349	685335.1290	1671082.2690	4051.14	OT-C544-FFLUEN	685136.5044	1670597.9541
350	685336.2280	1671075.8560	4050.85	OT-C544-LEACH	685137.6031	1670591.5430
351	685323.3310	1671071.0830	4049.91	OT-C544-LEACH	685124.7098	1670586.7714
352	685297.8990	1671068.1360	4048.16	OT-C544-LEACH	685099.2852	1670583.8252
353	685296.9990	1671078.2660	4047.94	OT-C544-LEACH	685098.3855	1670593.9523
354	685317.0900	1671090.9580	4049.62	OT-C544-LEACH	685118.4707	1670606.6406
355	685334.6940	1671090.0750	4050.81	OT-C544-LEACH	685136.0696	1670605.7579
356	685360.4020	1671127.4140	4053.89	OT-C544-BLDGCOR	685161.7701	1670643.0860
357	685349.8450	1671114.5020	4052.32	OT-C544-BLDGCOR	685151.2162	1670630.1778
358	685360.3480	1671033.1240	4052.96	OT-C544-BLDGCOR	685161.7161	1670548.8234
359	685371.1230	1671022.2010	4053.70	OT-C544-BLDGCOR	685172.4880	1670537.9035
360	669828.5970	1693339.1960	4077.44	TU/US-C503-STATION1	669634.4665	1692848.4306
361	669823.8520	1693340.4930	4077.30	TU/US-C503-STATION2	669629.7229	1692849.7272
362	669816.1660	1693331.0930	4077.32	TU/US-C503-STATION3	669622.0391	1692840.3299
363	669804.9830	1693324.1990	4077.14	TU/US-C503-STATION5	669610.8594	1692833.4379
364	669830.2120	1693344.6950	4077.63	TU/US-C503-STATION4	669636.0811	1692853.9280

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
365	669820.3680	1693343.5050	4078.10	TU/US-C503-USTTANK	669626.2399	1692852.7383
366	669826.9160	1693337.2450	4077.78	TU/US-C503-USTTANK	669632.7860	1692846.4802
367	669831.7020	1693342.9300	4077.73	TU/US-C503-USTTANK	669637.5706	1692852.1635
368	669817.5060	1693300.2710	4077.28	TU/US-C503-BLDGCOR	669623.3788	1692809.5169
369	669817.0280	1693314.4610	4077.69	TU/US-C503-BLDGCOR	669622.9009	1692823.7028
370	669870.4630	1693326.6030	4077.24	TU/US-C503-BLDGCOR	669676.3204	1692835.8412
371	669857.6770	1693326.9550	4077.12	TU/US-C503-BLDGCOR	669663.5381	1692836.1931
372	669799.9830	1693280.8270	4076.53	TU/US-C503-BLDGCOR	669605.8608	1692790.0785
373	669786.0040	1693280.0690	4077.00	TU/US-C503-BLDGCOR	669591.8859	1692789.3207
374	669753.1970	1693299.5360	4076.55	TU/US-C503-MW1-CASIN	669559.0884	1692808.7821
375	669753.0160	1693299.6510	4076.22	TU/US-C503-MW1-PVC	669558.9075	1692808.8971
376	669717.9520	1693348.6000	4074.92	TU/US-C503-MW3-PVC	669523.8536	1692857.8319
377	669718.0930	1693348.2730	4075.65	TU/US-C503-MW3-CASIN	669523.9946	1692857.5050
378	669746.8950	1693329.2100	4076.92	TU/US-C503-BLDGCOR	669552.7882	1692838.4475
379	669747.5820	1693308.1150	4076.21	TU/US-C503-BLDGCOR	669553.4750	1692817.3586
380	669906.5180	1693361.1640	4077.43	TU/US-C503-MW2-CASIN	669712.3650	1692870.3922
381	669906.2520	1693361.2650	4077.07	TU/US-C503-MW2-PVC	669712.0990	1692870.4932
382	669887.0390	1693344.8910	4077.53	TU/US-C503-BLDGCOR	669692.8916	1692854.1239
383	669886.0230	1693359.0930	4077.99	TU/US-C503-BLDGCOR	669691.8759	1692868.3218
384	670862.3470	1691695.2520	4072.78	TU/US-C500-MW1-CASIN	670667.9169	1691204.9630
385	670862.1340	1691695.4850	4072.39	TU/US-C500-MW1-PVC	670667.7040	1691205.1960
386	670897.1420	1691671.0590	4072.25	TU/US-C500-MW2-PVC	670702.7019	1691180.7771
387	670897.3420	1691670.8340	4072.66	TU/US-C500-MW2-CASIN	670702.9018	1691180.5521
388	670997.2710	1691721.0890	4072.90	TU/US-C500-MW3-CASIN	670802.8018	1691230.7926
389	670996.9840	1691721.2540	4072.41	TU/US-C500-MW3-PVC	670802.5149	1691230.9575
390	670952.1640	1691699.4910	4072.04	TU/US-C500-STATION1	670757.7079	1691209.2008
391	670948.0960	1691682.1740	4072.36	TU/US-C500-STATION4	670753.6411	1691191.8888
392	670936.4590	1691683.8290	4072.05	TU/US-C500-STATION5	670742.0075	1691193.5434
393	670929.6330	1691690.0950	4072.11	TU/US-C500-STATION2	670735.1834	1691199.8075
394	670923.0530	1691673.0510	4072.18	TU/US-C500-STATION3	670728.6054	1691182.7685
395	670946.5050	1691708.7370	4072.40	TU/US-C500-USTPIT	670752.0506	1691218.4441
396	670961.7540	1691693.8260	4072.62	TU/US-C500-USTPIT	670767.2951	1691203.5375
397	670931.1680	1691662.3970	4072.93	TU/US-C500-USTPIT	670736.7180	1691172.1176
398	670915.4940	1691676.4560	4072.43	TU/US-C500-USTPIT	670721.0485	1691186.1725
399	670921.7940	1691667.6910	4072.61	TU/US-C500-BLDGCOR	670727.3467	1691177.4100
400	670938.3020	1691685.3670	4072.19	TU/US-C500-BLDGCOR	670743.8499	1691195.0809
401	670954.8550	1691686.5260	4072.52	TU/US-C500-BLDGCOR	670760.3981	1691196.2396
402	670964.2580	1691691.8600	4072.50	TU/US-C500-BLDGCOR	670769.7984	1691201.5720
403	670981.1410	1691692.8760	4072.84	TU/US-C500-BLDGCOR	670786.6765	1691202.5877
404	681138.2190	1690535.4430	4109.80	OT-C538-MW1-CASING	680940.8108	1690045.4902
405	681137.9660	1690535.5040	4109.43	OT-C538-MW1-PVC	680940.5579	1690045.5512
406	681154.3000	1690506.8540	4109.64	OT-C538-STATION3	680956.8871	1690016.9095
407	681170.7650	1690504.3700	4110.30	OT-C538-STATION2	680973.3473	1690014.4262
408	681207.7160	1690542.9160	4110.07	OT-C538-STATION1	681010.2876	1690052.9610
409	681171.2020	1690513.1430	4110.35	OT-C538-SEPTIC	680973.7842	1690023.1966
410	681160.8350	1690514.8700	4110.22	OT-C538-SEPTIC	680963.4202	1690024.9231
411	681157.5830	1690502.2430	4109.87	OT-C538-SEPTIC	680960.1692	1690012.2998
412	681168.6240	1690500.8410	4110.30	OT-C538-SEPTIC	680971.2070	1690010.8982
413	681157.7430	1690507.8780	4109.92	OT-C538-FFLUEN	680960.3291	1690017.9332
414	681149.7900	1690513.8560	4109.82	OT-C538-FFLUEN	680952.3784	1690023.9094
415	681146.2870	1690511.1610	4109.76	OT-C538-LEACH	680948.8764	1690021.2152
416	681140.0690	1690516.2140	4109.76	OT-C538-LEACH	680942.6602	1690026.2667
417	681131.8360	1690535.6580	4109.59	OT-C538-LEACH	680934.4296	1690045.7051
418	681142.3480	1690541.6090	4109.45	OT-C538-LEACH	680944.9386	1690051.6544
419	681148.4850	1690524.6340	4109.80	OT-C538-LEACH	680951.0738	1690034.6843
420	681152.9240	1690518.6140	4110.01	OT-C538-LEACH	680955.5115	1690028.6661
421	681171.0630	1690513.0040	4110.32	OT-C538-EFLUEN	680973.6453	1690023.0577
422	681199.3120	1690534.6340	4109.92	OT-C538-EFLUEN	681001.8861	1690044.6814
423	681311.9210	1690619.8910	4111.94	OT-C538-EFLUEN	681114.4624	1690129.9137
424	681378.0600	1690614.8720	4112.52	OT-C538-EFLUEN	681180.5823	1690124.8962
425	681511.9950	1690621.0250	4112.35	OT-C538-EFLUEN-C/O	681314.4785	1690131.0474
426	681543.8210	1690614.3290	4112.13	OT-C538-EFLUEN-C/O	681346.2952	1690124.3533
427	681545.1500	1690624.0320	4110.59	OT-C538-EFLUEN	681347.6238	1690134.0535
428	681526.9290	1690617.7410	4112.19	OT-C538-BLDGCOR	681329.4081	1690127.7643
429	681516.5600	1690627.6780	4112.22	OT-C538-BLDGCOR	681319.0421	1690137.6984
430	681517.0030	1690674.6590	4112.55	OT-C538-BLDGCOR	681319.4850	1690184.6658
431	681526.9640	1690685.0850	4112.68	OT-C538-BLDGCOR	681329.4431	1690195.0888
432	681610.3380	1690617.1910	4112.15	OT-C538-BLDGCOR	681412.7929	1690127.2145
433	681620.0290	1690626.9090	4112.29	OT-C538-BLDGCOR	681422.4811	1690136.9297
434	681248.7970	1690511.7190	4110.11	OT-C537-STATION1	681051.3567	1690021.7731
435	681230.2540	1690505.9940	4109.96	OT-C537-STATION2	681032.8191	1690016.0497

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
436	681220.0430	1690509.7920	4110.12	OT-C537-STATION3	681022.6111	1690019.8466
437	681224.9030	1690501.6020	4109.95	OT-C537-SEPTICDRY	681027.4697	1690011.6590
438	681224.2220	1690518.0560	4110.28	OT-C537-SEPTICDRY	681026.7889	1690028.1082
439	681236.7540	1690518.9910	4110.31	OT-C537-SEPTICDRY	681039.3172	1690029.0429
440	681236.4080	1690501.8520	4110.13	OT-C537-SEPTICDRY	681038.9713	1690011.9089
441	681237.2180	1690508.8330	4110.12	OT-C537-INLINE	681039.7811	1690018.8879
442	681311.7430	1690515.4440	4111.03	OT-C537-INLINE	681114.2845	1690025.4970
443	670561.7210	1680587.5740	4050.10	TU/US-C506-MW2-CASIN	670367.3781	1680100.5043
444	670561.4170	1680587.6760	4049.68	TU/US-C506-MW2-PVC	670367.0742	1680100.6062
445	670504.3430	1680580.0920	4050.14	TU/US-C506-MW1-PVC	670310.0167	1680093.0244
446	670504.5340	1680580.0020	4050.56	TU/US-C506-MW1-CASIN	670310.2076	1680092.9345
447	670508.2600	1680580.6030	4050.26	TU/US-C506-USTTANK	670313.9326	1680093.5353
448	670507.1490	1680575.9500	4050.27	TU/US-C506-USTTANK	670312.8219	1680088.8836
449	670517.9280	1680578.9030	4050.27	TU/US-C506-USTTANK	670323.5978	1680091.8358
450	670517.4300	1680574.2280	4050.28	TU/US-C506-USTTANK	670323.0999	1680087.1621
451	670507.9350	1680578.1630	4050.18	TU/US-C506-STATION1	670313.6077	1680091.0960
452	670513.3690	1680579.8330	4050.20	TU/US-C506-STATION2	670319.0401	1680092.7655
453	670517.9640	1680576.4150	4050.25	TU/US-C506-STATION3	670323.6338	1680089.3485
454	670511.2330	1680575.3810	4050.12	TU/US-C506-STATION4	670316.9047	1680088.3148
455	670512.5770	1680577.6370	4050.16	TU/US-C506-STATION5	670318.2483	1680090.5702
456	670485.1820	1680557.6150	4050.53	TU/US-C506-EXMW1-CAS	670290.8613	1680070.5540
457	670484.8980	1680557.6790	4050.38	TU/US-C506-EXMW1-PVC	670290.5773	1680070.6179
458	670494.8180	1680553.5430	4050.36	TU/US-C506-BLDGCOR	670300.4945	1680066.4831
459	670506.7310	1680561.7710	4050.38	TU/US-C506-BLDGCOR	670312.4040	1680074.7088
460	670510.1770	1680607.5970	4050.36	TU/US-C506-BLDGCOR	670315.8490	1680120.5215
461	670507.2460	1680618.1900	4050.39	TU/US-C506-BLDGCOR	670312.9189	1680131.1114
462	672564.5350	1692766.5990	4084.67	OT-C530-STATION1	672369.6116	1692275.9995
463	672567.1650	1692774.7240	4084.79	OT-C530-STATION2	672372.2409	1692284.1222
464	672567.5210	1692771.2850	4084.93	OT-C530-ACTSEPTIC	672372.5967	1692280.6842
465	672572.0780	1692767.3740	4084.89	OT-C530-ACTSEPTIC	672377.1524	1692276.7743
466	672575.8660	1692771.9070	4084.91	OT-C530-ACTSEPTIC	672380.9393	1692281.3060
467	672571.4280	1692775.8290	4084.95	OT-C530-ACTSEPTIC	672376.5026	1692285.2269
468	672569.6900	1692769.3550	4084.91	OT-C530-INLINE	672374.7651	1692278.7547
469	672563.6000	1692772.1360	4084.83	OT-C530-MW-CASING	672368.6769	1692281.5349
470	672563.2920	1692772.2960	4084.49	OT-C530-MW-PVC	672368.3690	1692281.6949
471	672509.9810	1692700.4750	4085.41	OT-C530-INLINE	672315.0734	1692209.8947
472	672538.3940	1692677.7240	4085.37	OT-C530-BLDGCOR	672343.4782	1692187.1503
473	672538.9710	1692663.8680	4085.27	OT-C530-BLDGCOR	672344.0550	1692173.2983
474	672478.3960	1692731.8290	4085.45	OT-C530-BLDGCOR	672283.4976	1692241.2396
475	672485.2490	1692739.1720	4085.12	OT-C530-BLDGCOR	672290.3486	1692248.5805
476	685978.3640	1686617.0530	4101.95	OT-C534-STATION1	685779.5530	1686128.2358
477	685949.9370	1686623.2970	4101.80	OT-C534-STATION2	685751.1342	1686134.4780
478	686041.6810	1686591.0650	4102.58	OT-C534-BLDGCOR	685842.8517	1686102.2553
479	686050.4200	1686580.6970	4102.78	OT-C534-BLDGCOR	685851.5881	1686091.8903
480	686053.7100	1686616.8100	4102.90	OT-C534-BLDGCOR	685854.8772	1686127.9929
481	686043.1140	1686607.6280	4102.82	OT-C534-BLDGCOR	685844.2842	1686118.8135
482	670482.5190	1680558.2400	4050.60	TU/US-C506-MW3-CASIN	670288.1990	1680071.1788
483	670482.3210	1680558.1750	4050.11	TU/US-C506-MW3-PVC	670288.0011	1680071.1138
484	669451.6250	1685381.2210	4054.88	TU/US-C515-STATION1	669257.6038	1684892.7620
485	669456.5920	1685373.9060	4054.66	TU/US-C515-STATION2	669262.5694	1684885.4491
486	669447.7270	1685364.3830	4054.13	TU/US-C515-STATION3	669253.7069	1684875.9289
487	669442.7430	1685375.3260	4054.34	TU/US-C515-STATION4	669248.7244	1684886.8687
488	669450.0780	1685373.9310	4054.62	TU/US-C515-STATION5	669256.0572	1684885.4741
489	669529.8630	1685390.3120	4053.57	TU/US-C515-MW3-PVC	669335.8191	1684901.8503
490	669530.0710	1685390.1630	4053.84	TU/US-C515-MW3-CASIN	669336.0271	1684901.7014
491	669347.3380	1685357.3580	4053.37	TU/US-C515-MW2-CASIN	669153.3470	1684868.9059
492	669347.0390	1685357.4240	4052.93	TU/US-C515-MW2-PVC	669153.0481	1684868.9719
493	669367.7310	1685396.1250	4053.43	TU/US-C515-MW1-PVC	669173.7341	1684907.6617
494	669368.0180	1685396.0880	4053.86	TU/US-C515-MW1-CASIN	669174.0210	1684907.6247
495	669413.7390	1685386.4140	4054.97	TU/US-C515-BLDGCOR	669219.7288	1684897.9535
496	669405.0760	1685397.5400	4056.39	TU/US-C515-BLDGCOR	669211.0683	1684909.0762
497	669442.6490	1685383.8010	4054.90	TU/US-C515-TANKPIT	669248.6304	1684895.3412
498	669458.4310	1685381.6630	4055.08	TU/US-C515-TANKPIT	669264.4078	1684893.2039
499	669454.7400	1685363.6010	4054.47	TU/US-C515-TANKPIT	669260.7179	1684875.1471
500	669440.8050	1685364.3540	4054.07	TU/US-C515-TANKPIT	669246.7869	1684875.8999
501	669474.3460	1685377.9770	4054.82	TU/US-C515-BLDGCOR	669280.3182	1684889.5189
502	669485.4880	1685386.3880	4055.07	TU/US-C515-BLDGCOR	669291.4570	1684897.9275
503	669257.8420	1685415.0700	4053.20	TU/US-C513-STATION3	669063.8770	1684926.6012
504	669241.6200	1685431.8260	4053.43	TU/US-C513-STATION2	669047.6597	1684943.3523
505	669234.6840	1685421.2410	4053.75	TU/US-C513-STATION5	669040.7257	1684932.7704
506	669232.2550	1685409.8190	4053.42	TU/US-C513-STATION4	669038.2974	1684921.3517

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

Corrections

Point #515
TU/US-515-MW3 PVC

Point #518
TU/US-515-MW2

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
507	669220.1400	1685422.8010	4053.52	TU/US-C513-STATION1	669026.1859	1684934.3299
508	669222.4590	1685431.2530	4053.64	TU/US-C513-TANKPIT	669028.5042	1684942.7795
509	669219.3990	1685411.0450	4054.92	TU/US-C513-TANKPIT	669025.4451	1684922.5773
510	669260.7320	1685426.0370	4053.70	TU/US-C513-TANKPIT	669066.7661	1684937.5650
511	669277.6950	1685433.5720	4053.31	TU/US-C513-MW2-CASIN	669083.7242	1684945.0978
512	669243.5650	1685418.8110	4054.36	TU/US-C513-TRANSPAD	669049.6041	1684930.3411
513	669236.4970	1685419.8090	4054.30	TU/US-C513-TRANSPAD	669042.5381	1684931.3388
514	669235.5680	1685411.9050	4054.57	TU/US-C513-TRANSPAD	669041.6094	1684923.4371
515	669277.6850	1685433.6210	4053.26	TU/US-C513-MW2-C[illegible] PVC	669083.7142	1684945.1468 → MW3
516	669188.9570	1685441.5400	4053.76	TU/US-C513-MW1-CASIN	668995.0119	1684953.0635
517	669188.7180	1685441.6230	4053.31	TU/US-C513-MW1-PVC	668994.7730	1684953.1465
518	669175.0530	1685411.5360	4053.78	TU/US-C513-MW3-PVC	668981.1120	1684923.0682 → MW2
519	669175.2900	1685411.4450	4054.15	TU/US-C513-MW3-CASIN	668981.3489	1684922.9772
520	669194.6820	1685411.4540	4054.72	TU/US-C513-BLDGCOR	669000.7353	1684922.9862
521	669205.8290	1685420.1440	4054.47	TU/US-C513-BLDGCOR	669011.8790	1684931.6737
522	669292.6520	1685418.3920	4053.83	TU/US-C513-BLDGCOR	669098.6769	1684929.9222
523	669293.9380	1685428.2990	4053.77	TU/US-C513-BLDGCOR	669099.9625	1684939.8263
524	685879.9040	1686627.7590	4102.02	OTC-534-CASING	685681.1215	1686138.9387
525	685879.6290	1686627.7910	4101.61	OTC-534-PVC	685680.8466	1686138.9707
526	685894.0510	1686651.2940	4102.15	OTC-534-MW6-CASING	685695.2644	1686162.4669
527	685893.7240	1686651.3020	4101.74	OTC-534-MW6-PVC	685694.9375	1686162.4749
528	685866.3710	1686655.8860	4101.59	OTC-534-MW8-PVC	685667.5925	1686167.0576
529	685866.6060	1686655.6520	4102.06	OTC-534-MW8-CASING	685667.8274	1686166.8236
530	685876.1160	1686687.3140	4102.11	OTC-534-MW5-CASING	685677.3346	1686198.4764
531	685875.8760	1686687.4250	4101.81	OTC-534-MW5-PVC	685677.0947	1686198.5874
532	685834.9910	1686704.4610	4101.83	OTC-534-MW9-PVC	685636.2216	1686215.6185
533	685835.2820	1686704.5300	4102.15	OTC-534-MW9-CASING	685636.5125	1686215.6875
534	685772.4780	1686595.2240	4101.45	OTC-534-MW10-NG	685573.7267	1686106.4131
535	669081.1480	1678793.1860	4046.72	OTC-531B-SEPTANK	668887.2342	1678306.6363
536	669082.4390	1678801.3130	4046.63	OTC-531B-SEPTANK	668888.5248	1678314.7610
537	669072.3810	1678802.9790	4046.81	OTC-531B-SEPTANK	668878.4697	1678316.4265
538	669070.8860	1678795.3530	4046.82	OTC-531B-SEPTANK	668876.9751	1678308.8027
539	669104.1410	1678787.7690	4045.69	OTC-531B-STATION-1	668910.2205	1678301.2209
540	669070.9690	1678801.9800	4046.52	OTC-531B-STATION-2	668877.0581	1678315.4278
541	669061.4820	1678787.2510	4046.24	OTC-531B-STATION-3	668867.5739	1678300.7031
542	669022.2810	1678760.4940	4045.98	OTC-531B-MW-1-PVC	668828.3842	1678273.9538
543	669022.4740	1678760.4670	4046.35	OTC-531B-MW-1-CASING	668828.5772	1678273.9268
544	669029.7060	1678750.8610	4046.12	OTC-531B-LEACH	668835.8071	1678264.3236
545	669044.0770	1678753.3070	4046.04	OTC-531B-LEACH	668850.1739	1678266.7689
546	669048.2090	1678762.3910	4046.19	OTC-531B-LEACH	668854.3047	1678275.8503
547	669052.8600	1678773.5200	4046.17	OTC-531B-LEACH	668858.9544	1678286.9760
548	669051.8580	1678782.0380	4046.19	OTC-531B-LEACH	668857.9527	1678295.4916
549	669045.9680	1678791.0410	4045.97	OTC-531B-LEACH	668852.0644	1678304.4920
550	669037.6080	1678787.3270	4046.05	OTC-531B-LEACH	668843.7068	1678300.7790
551	669030.8940	1678787.9690	4046.07	OTC-531B-LEACH	668836.9947	1678301.4208
552	669024.6850	1678794.4050	4045.99	OTC-531B-LEACH	668830.7875	1678307.8550
553	669012.0060	1678808.0140	4045.98	OTC-531B-LEACH	668818.1122	1678321.4600
554	669005.0390	1678788.3970	4045.95	OTC-531B-LEACH	668811.1472	1678301.8487
555	669008.1540	1678771.5710	4046.05	OTC-531B-LEACH	668814.2613	1678285.0276
556	669012.3090	1678761.0960	4046.10	OTC-531B-LEACH	668818.4151	1678274.5556
557	669052.5660	1678784.6580	4046.08	OTC-531B-FLINE	668858.6605	1678298.1108
558	669071.4380	1678798.9230	4046.55	OTC-531B-FLINE	668877.5270	1678312.3717
559	669082.2160	1678797.7200	4046.58	OTC-531B-ELINE	668888.3019	1678311.1690
560	669109.7160	1678792.3340	4045.64	OTC-531B-ELINE	668915.7939	1678305.7846
561	669130.6340	1678787.5660	4047.05	OTC-531B-ELINE	668936.7058	1678301.0180
562	669132.6960	1678800.0880	4046.87	OTC-531B-BLDGCOR	668938.7672	1678313.5363
563	669139.6540	1678804.9540	4046.97	OTC-531B-BLDGCOR	668945.7232	1678318.4009
564	669127.3740	1678771.5760	4046.72	OTC-531B-BLDGCOR	668933.4468	1678285.0326
565	669131.8520	1678764.6150	4047.25	OTC-531B-BLDGCOR	668937.9235	1678278.0736
566	668593.1300	1678901.9680	4046.19	OTC-531C-BLDGCOR	668399.3576	1678415.3868
567	668588.1250	1678902.8360	4046.21	OTC-531C-BLDGCOR	668394.3541	1678416.2546
568	668585.3350	1678865.5840	4046.55	OTC-531C-BLDGCOR	668391.5649	1678379.0133
569	668590.1110	1678858.6070	4046.53	OTC-531C-BLDGCOR	668396.3395	1678372.0384
570	668590.3090	1678889.4560	4045.95	OTC-531C-ELINE	668396.5374	1678402.8784
571	668578.4210	1678891.4650	4046.03	OTC-531C-ELINE	668384.6529	1678404.8868
572	668560.7680	1678894.7530	4045.47	OTC-531C-ELINE	668367.0050	1678408.1739
573	668535.6480	1678899.2930	4046.35	OTC-531C-ELINE	668341.8923	1678412.7126
574	668535.0660	1678896.4960	4046.68	OTC-531C-SEPTIC	668341.3104	1678409.9164
575	668535.3940	1678905.9700	4046.47	OTC-531C-SEPTIC	668341.6383	1678419.3876
576	668522.2510	1678906.9450	4046.51	OTC-531C-SEPTIC	668328.4992	1678420.3624
577	668522.3100	1678897.4040	4046.39	OTC-531C-SEPTIC	668328.5581	1678410.8241

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
578	668561.9930	1678890.5660	4045.66	OTC-531C-STATION-1	668368.2296	1678403.9881
579	668531.2500	1678902.0810	4046.55	OTC-531C-STATION-2	668337.4955	1678415.4998
580	668522.9580	1678893.5110	4045.84	OTC-531C-STATION-3	668329.2059	1678406.9323
581	668521.6100	1678902.7660	4046.16	OTC-531C-FLINE	668327.8583	1678416.1846
582	668515.2610	1678901.5740	4045.66	OTC-531C-FLINE	668321.5112	1678414.9929
583	668515.8520	1678907.4010	4045.67	OTC-531C-LEACH	668322.1020	1678420.8182
584	668498.6960	1678906.8280	4045.81	OTC-531C-LEACH	668304.9510	1678420.2454
585	668489.9270	1678907.6430	4045.74	OTC-531C-LEACH	668296.1845	1678421.0602
586	668481.5760	1678902.8790	4045.69	OTC-531C-LEACH	668287.8359	1678416.2975
587	668476.1180	1678891.3230	4045.84	OTC-531C-LEACH	668282.3795	1678404.7449
588	668473.4290	1678883.0340	4045.68	OTC-531C-LEACH	668279.6913	1678396.4583
589	668473.7340	1678874.2510	4045.53	OTC-531C-LEACH	668279.9962	1678387.6778
590	668476.2360	1678867.2340	4045.54	OTC-531C-LEACH	668282.4975	1678380.6629
591	668482.1720	1678868.3950	4045.45	OTC-531C-MW-1-PVC	668288.4318	1678381.8235
592	668482.4510	1678868.3680	4045.85	OTC-531C-MW-1-CASING	668288.7107	1678381.7965
593	668490.9400	1678863.0190	4045.60	OTC-531C-LEACH	668297.1972	1678376.4491
594	668503.3450	1678866.8310	4045.87	OTC-531C-LEACH	668309.5986	1678380.2600
595	668508.4050	1678874.1920	4045.93	OTC-531C-LEACH	668314.6572	1678387.6189
596	668515.8970	1678879.7420	4045.82	OTC-531C-LEACH	668322.1470	1678393.1672
597	668524.3970	1678890.3500	4045.70	OTC-531C-LEACH	668330.6445	1678403.7722
598	667495.6300	1679128.7300	4042.53	OTC-532-BLDGCOR	667302.1757	1678642.0831
599	667488.6400	1679123.9580	4042.71	OTC-532-BLDGCOR	667295.1877	1678637.3125
600	667462.6660	1679059.4970	4041.10	OTC-532-BLDGCOR	667269.2212	1678572.8701
601	667481.1840	1679050.1710	4042.61	OTC-532-BLDGCOR	667287.7339	1678563.5469
602	667486.0130	1679106.7520	4042.73	OTC-532-ELINE	667292.5615	1678620.1115
603	667462.4800	1679111.5030	4040.38	OTC-532-ELINE	667269.0353	1678624.8611
604	667462.2250	1679114.4150	4040.62	OTC-532-STATION-1	667268.7804	1678627.7722
605	667442.0090	1679119.1410	4041.24	OTC-532-STATION-2	667248.5702	1678632.4969
606	667419.1640	1679115.1840	4040.86	OTC-532-STATION-3	667225.7319	1678628.5410
607	667385.6930	1679101.6040	4040.50	OTC-532-STATION-4	667192.2706	1678614.9649
608	667381.8850	1679101.5680	4040.62	OTC-532-LEACH	667188.4637	1678614.9290
609	667383.6400	1679091.6130	4040.63	OTC-532-LEACH	667190.2181	1678604.9768
610	667385.4250	1679087.0370	4040.57	OTC-532-LEACH	667192.0026	1678600.4022
611	667388.9960	1679084.4040	4040.65	OTC-532-LEACH	667195.5726	1678597.7699
612	667394.2390	1679084.6140	4040.73	OTC-532-LEACH	667200.8141	1678597.9799
613	667396.1210	1679092.7430	4040.70	OTC-532-LEACH	667202.6955	1678606.1065
614	667398.1240	1679100.9150	4040.70	OTC-532-LEACH	667204.6979	1678614.2761
615	667402.2360	1679106.9240	4040.75	OTC-532-LEACH	667208.8088	1678620.2834
616	667410.1270	1679109.8530	4040.82	OTC-532-LEACH	667216.6975	1678623.2116
617	667419.4540	1679110.1630	4040.85	OTC-532-LEACH	667226.0218	1678623.5215
618	667420.7270	1679120.1400	4041.02	OTC-532-FLINE	667227.2944	1678633.4956
619	667423.8510	1679141.7780	4040.59	OTC-532-LEACH	667230.4175	1678655.1273
620	667412.2990	1679143.4760	4040.74	OTC-532-LEACH	667218.8688	1678656.8248
621	667403.7350	1679143.1670	4040.80	OTC-532-LEACH	667210.3073	1678656.5159
622	667397.0900	1679139.6510	4040.75	OTC-532-LEACH	667203.6642	1678653.0009
623	667384.3300	1679127.9250	4040.44	OTC-532-LEACH	667190.9079	1678641.2783
624	667382.6070	1679116.1130	4040.44	OTC-532-LEACH	667189.1854	1678629.4697
625	667430.4810	1679118.6630	4041.32	OTC-532-FLINE	667237.0456	1678632.0190
626	667430.2210	1679114.2980	4041.25	OTC-532-SEPTIC	667236.7856	1678627.6553
627	667440.5880	1679113.0200	4041.26	OTC-532-SEPTIC	667247.1496	1678626.3776
628	667442.9470	1679123.3120	4041.21	OTC-532-SEPTIC	667249.5080	1678636.6667
629	667430.1210	1679125.8580	4041.28	OTC-532-SEPTIC	667236.6857	1678639.2119
630	667441.8110	1679116.2010	4041.27	OTC-532-ELINE	667248.3723	1678629.5577
631	669659.5140	1678688.1920	4048.05	OTC-531A-ELINE	669465.4326	1678201.6728
632	669645.1200	1678691.4170	4047.42	OTC-531A-ELINE	669451.0427	1678204.8968
633	669626.5240	1678694.6570	4048.54	OTC-531A-ELINE	669432.4521	1678208.1359
634	669625.4550	1678690.5680	4048.58	OTC-531A-SEPTIC	669431.3834	1678204.0481
635	669627.0130	1678697.2200	4048.59	OTC-531A-SEPTIC	669432.9410	1678210.6981
636	669614.1180	1678700.1730	4048.60	OTC-531A-SEPTIC	669420.0497	1678213.6503
637	669613.0940	1678693.8150	4048.72	OTC-531A-SEPTIC	669419.0260	1678207.2941
638	669648.5430	1678685.0250	4047.24	OTC-531A-STATION-1	669454.4647	1678198.5067
639	669615.3510	1678691.9600	4048.59	OTC-531A-STATION-2	669421.2823	1678205.4397
640	669607.0140	1678691.1700	4048.42	OTC-531A-STATION-3	669412.9478	1678204.6499
641	669606.7200	1678688.2040	4048.56	OTC-531A-LEACH	669412.6539	1678201.6848
642	669608.9270	1678706.1330	4048.28	OTC-531A-LEACH	669414.8602	1678219.6086
643	669601.3790	1678707.8980	4048.13	OTC-531A-LEACH	669407.3144	1678221.3730
644	669593.2420	1678708.2220	4047.49	OTC-531A-LEACH	669399.1798	1678221.6970
645	669578.1380	1678708.5010	4047.22	OTC-531A-LEACH	669384.0801	1678221.9759
646	669565.0490	1678706.1840	4047.29	OTC-531A-LEACH	669370.9949	1678219.6595
647	669554.2260	1678694.3690	4047.37	OTC-531A-LEACH	669360.1751	1678207.8480
648	669553.4160	1678687.6760	4047.59	OTC-531A-LEACH	669359.3653	1678201.1569

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
649	669552.5940	1678678.4030	4047.76	OTC-531A-LEACH	669358.5435	1678191.8866
650	669550.0120	1678656.4050	4047.76	OTC-531A-LEACH	669355.9623	1678169.8950
651	669556.1880	1678652.3190	4047.86	OTC-531A-LEACH	669362.1365	1678165.8102
652	669559.2580	1678655.8340	4047.38	OTC-531A-MW-1-PVC	669365.2056	1678169.3241
653	669559.5100	1678655.7600	4047.78	OTC-531A-MW-1-CASING	669365.4575	1678169.2502
654	669561.9190	1678650.8880	4047.69	OTC-531A-LEACH	669367.8658	1678164.3796
655	669569.0970	1678659.8040	4048.02	OTC-531A-LEACH	669375.0418	1678173.2930
656	669574.5390	1678669.0420	4047.77	OTC-531A-LEACH	669380.4822	1678182.5283
657	669580.0480	1678677.6210	4047.77	OTC-531A-LEACH	669385.9896	1678191.1048
658	669581.1180	1678685.2190	4047.72	OTC-531A-LEACH	669387.0593	1678198.7006
659	669589.3790	1678690.0080	4047.91	OTC-531A-LEACH	669395.3179	1678203.4882
660	669598.7410	1678687.4540	4047.88	OTC-531A-LEACH	669404.6772	1678200.9350
661	669608.6000	1678697.8630	4048.38	OTC-531A-FLINE	669414.5333	1678211.3410
662	669613.4950	1678697.0050	4048.61	OTC-531A-FLINE	669419.4269	1678210.4832
663	669434.7190	1685385.1220	4055.15	US/TC-515-EXAVATION	669240.7027	1684896.6618
664	669433.7320	1685375.0770	4054.68	US/TC-515-EXAVATION	669239.7160	1684886.6198
665	669453.6100	1685372.2880	4054.89	US/TC-515-EXAVATION	669259.5882	1684883.8316
666	669455.2490	1685382.6100	4055.08	US/TC-515-EXAVATION	669261.2268	1684894.1506
667	669423.1290	1685379.3360	4054.73	US/TC-515-POTHOLE-1	669229.1161	1684890.8775
668	669443.7270	1685362.1260	4054.20	US/TC-515-POTHOLE-2	669249.7081	1684873.6725
669	669443.2340	1685352.4030	4053.69	US/TC-515-POTHOLE-3	669249.2152	1684863.9523
670	669388.8600	1685382.9350	4054.36	US/TC-515-POTHOLE-4	669194.8570	1684894.4755
671	666075.3380	1693454.3920	4059.75	US/TC-502-TANK/EX	665882.2953	1692963.5932
672	666064.5480	1693454.6090	4059.59	US/TC-502-TANK/EX	665871.5084	1692963.8101
673	666064.5890	1693463.2320	4059.66	US/TC-502-TANK/EX	665871.5494	1692972.4306
674	666075.7420	1693463.6580	4059.85	US/TC-502-TANK/EX	665882.6992	1692972.8565
675	666070.2430	1693458.8620	4059.56	US/TC-502-STATION-1	665877.2018	1692968.0619
676	666075.3470	1693459.1030	4059.61	US/TC-502-STATION-2	665882.3043	1692968.3028
677	666070.4890	1693455.0470	4059.46	US/TC-502-STATION-3	665877.4477	1692964.2480
678	666070.2650	1693463.1340	4059.49	US/TC-502-STATION-4	665877.2238	1692972.3327
679	666072.2440	1693503.2780	4060.12	US/TC-502-FIREHY	665879.2022	1693012.4650
680	669813.9600	1693315.1950	4077.70	US/TC-503-EXAVATION	669619.8338	1692824.4365
681	669826.0790	1693326.7460	4077.45	US/TC-503-EXAVATION	669631.9493	1692835.9842
682	669815.4720	1693337.1950	4077.67	US/TC-503-EXAVATION	669621.3454	1692846.4302
683	669803.8000	1693324.4750	4077.59	US/TC-503-EXAVATION	669609.6767	1692833.7139
684	669818.2990	1693319.1730	4077.48	US/TC-503-BEGTRENCH	669624.1715	1692828.4134
685	669837.0790	1693303.2490	4076.88	US/TC-503-ENDTRENCH	669642.9461	1692812.4940
686	681138.0180	1690539.4590	4109.33	OTC-538-STATION-5	680940.6098	1690049.5050
687	673758.3950	1683356.5480	4060.55	US/TC-514-STATION-1	673563.1256	1682868.6758
688	673765.5540	1683358.1250	4060.47	US/TC-514-STATION-2	673570.2825	1682870.2523
689	673770.0890	1683350.4240	4060.48	US/TC-514-STATION-3	673574.8162	1682862.5535
690	673768.2490	1683354.2670	4060.48	US/TC-514-STATION-4	673572.9768	1682866.3954
691	673777.4280	1683353.4050	4060.71	US/TC-514-STATION-5	673582.1531	1682865.5337
692	673776.8350	1683359.0390	4060.94	US/TC-514-BLDGCOR	673581.5603	1682871.1661
693	673769.7480	1683353.9100	4060.70	US/TC-514-BLDGCOR	673574.4753	1682866.0385
694	673778.8570	1683370.4750	4060.92	US/TC-514-BLDGCOR	673583.5817	1682882.5987
695	673773.9440	1683377.3380	4060.70	US/TC-514-BLDGCOR	673578.6701	1682889.4597
696	673723.3370	1683411.0030	4060.56	US/TC-514-MW-1-PVC	673528.0778	1682923.1150
697	673723.6160	1683410.9000	4061.02	US/TC-514-MW-1-CASIN	673528.3567	1682923.0120
698	673699.2890	1683380.7720	4061.09	US/TC-514-MW-2-CASIN	673504.0367	1682892.8928
699	673698.9660	1683380.8260	4060.66	US/TC-514-MW-2-PVC	673503.7138	1682892.9467
700	673812.5550	1683317.4880	4060.43	US/TC-514-MW-3-PVC	673617.2699	1682829.6271
701	673812.8820	1683317.4350	4060.76	US/TC-514-MW-3-CASIN	673617.5968	1682829.5741
702	673776.7270	1683350.1350	4060.82	US/TC-514-FORM/TANK	673581.4523	1682862.2646
703	673777.3420	1683356.4370	4060.94	US/TC-514-FORM/TANK	673582.0671	1682868.5648
704	673759.1130	1683359.4810	4061.06	US/TC-514-FORM/TANK	673563.8434	1682871.6079
705	673757.7990	1683353.3170	4061.32	US/TC-514-FORM/TANK	673562.5298	1682865.4457
706	678061.9490	1684350.2580	4078.63	US/TC-516-FORMTANK	677865.4323	1683862.0978
707	678072.0100	1684348.4740	4078.61	US/TC-516-FORMTANK	677875.4904	1683860.3143
708	678074.0860	1684360.1530	4078.25	US/TC-516-FORMTANK	677877.5658	1683871.9899
709	678065.1290	1684362.4260	4078.47	US/TC-516-FORMTANK	677868.6114	1683874.2622
710	678069.6040	1684359.8850	4078.30	US/TC-516-STATION-1	677873.0851	1683871.7220
711	678064.5960	1684356.9350	4078.34	US/TC-516-STATION-2	677868.0786	1683868.7728
712	678066.1670	1684350.4200	4078.54	US/TC-516-STATION-3	677869.6491	1683862.2597
713	678072.9250	1684354.8490	4078.09	US/TC-516-STATION-4	677876.4052	1683866.6874
714	678101.7280	1684311.2380	4077.72	US/TC-516-MW-2	677905.1998	1683823.0891
715	678116.9250	1684291.3650	4077.78	US/TC-516-MW-2	677920.3924	1683803.2218
716	678061.7680	1684335.2520	4080.38	US/TC-516-BLDGCOR	677865.2514	1683847.0961
717	678064.6310	1684348.2080	4081.07	US/TC-516-BLDGCOR	677868.1136	1683860.0484
718	678026.7560	1684390.7900	4078.49	US/TC-516-MW-1	677830.2495	1683902.6180
719	678014.0050	1684363.8290	4077.81	US/TC-516-MW-3	677817.5022	1683875.6648

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
720	671269.9880	1692357.3370	4075.08	US/TC-508-FORM/TANK	671075.4398	1691866.8562
721	671299.4450	1692330.8640	4075.18	US/TC-508-FORM/TANK	671104.8883	1691840.3908
722	671324.3300	1692358.5130	4075.17	US/TC-508-FORM/TANK	671129.7661	1691868.0318
723	671294.8560	1692384.8580	4075.02	US/TC-508-FORM/TANK	671100.3006	1691894.3692
724	671311.5950	1692346.0080	4075.12	US/TC-508-STATION-2	671117.0347	1691855.5304
725	671302.2680	1692357.1830	4075.07	US/TC-508-STATION-1	671107.7104	1691866.7022
726	671312.4640	1692368.2800	4074.98	US/TC-508-STATION-4	671117.9035	1691877.7960
727	671282.5110	1692369.9060	4075.01	US/TC-508-STATION-3	671087.9592	1691879.4215
728	671289.2400	1692342.4620	4075.15	US/TC-508-STATION-5	671094.6862	1691851.9855
729	671373.3210	1692386.6060	4075.00	US/TC-508-MW-3-PVC	671178.7429	1691896.1167
730	671373.6120	1692386.5000	4075.33	US/TC-508-MW-3-CASIN	671179.0338	1691896.0107
731	671216.9160	1692488.1670	4075.54	US/TC-508-SS18-MW08-CASIN	671022.3832	1691997.6482
732	671216.7110	1692488.4340	4075.26	US/TC-508-SS18-MW08-PVC	671022.1782	1691997.9152
733	671236.3110	1692301.9320	4075.19	US/TC-508-MW-2-CASIN	671041.7726	1691811.4672
734	671236.1240	1692302.1450	4074.80	US/TC-508-MW-2-PVC	671041.5856	1691811.6801
735	671211.3090	1692324.4610	4075.35	US/TC-508-MW-1-CASIN	671016.7778	1691833.9897
736	671211.0360	1692324.6620	4074.93	US/TC-508-MW-1-PVC	671016.5049	1691834.1906
737	671174.1880	1692241.9700	4074.81	US/TC-508-SS18-MW16-PVC	670979.6676	1691751.5226
738	671174.4770	1692241.7880	4075.34	US/TC-508-SS18-MW16-CASIN	670979.9565	1691751.3406
739	671035.8870	1692106.1030	4074.42	US/TC-508-SS18-MW18-CASIN	670841.4066	1691615.6950
740	671035.6230	1692106.3690	4073.74	US/TC-508-SS18-MW18-PVC	670841.1427	1691615.9609
741	671043.1730	1692355.2630	4075.73	US/TC-508-SS18-MW19-PVC	670848.6905	1691864.7828
742	670383.2120	1691278.5670	4072.57	US/TC-504-MW-2-CASIN	670188.9208	1690788.3988
743	670383.0220	1691278.7790	4072.19	US/TC-504-MW-2-PVC	670188.7309	1690788.6107
744	670343.7050	1691297.2270	4072.57	US/TC-504-MW-1-PVC	670149.4253	1690807.0534
745	670343.9460	1691296.8630	4072.80	US/TC-504-MW-1-CASIN	670149.6662	1690806.6895
746	669680.3630	1678704.0610	4048.54	OTC-531A-BLDGCOR	669486.2755	1678217.5372
747	669673.4280	1678699.1340	4048.44	OTC-531A-BLDGCOR	669479.3425	1678212.6116
748	669662.1160	1678671.3190	4048.32	OTC-531A-BLDGCOR	669468.0338	1678184.8047
749	669671.0810	1678657.6480	4048.29	OTC-531A-BLDGCOR	669476.9962	1678171.1376
750	669671.6690	1678686.6260	4048.54	OTC-531A-ELINE	669477.5840	1678200.1072
751	670995.2900	1691723.6540	4072.55	US/TC-500-STATION-6	670800.8214	1691233.3568
752	682707.7150	1693994.3080	4139.12	OTC-539-SEPTIC	682509.8519	1693503.3527
753	682707.1360	1693987.5070	4139.01	OTC-539-SEPTIC	682509.2731	1693496.5537
754	682713.9270	1693987.3840	4139.07	OTC-539-SEPTIC	682516.0621	1693496.4307
755	682714.4020	1693993.8490	4139.12	OTC-539-SEPTIC	682516.5370	1693502.8939
756	682710.5050	1693994.2530	4139.11	OTC-539-ELINE	682512.6411	1693503.2977
757	682711.7750	1694038.3560	4139.83	OTC-539-ELINE	682513.9107	1693547.3880
758	682709.6340	1694009.1330	4139.38	OTC-539-STATION-1	682511.7704	1693518.1734
759	682715.9010	1693990.7160	4139.12	OTC-539-STATION-2	682518.0355	1693499.7618
760	682707.9950	1693985.7400	4139.05	OTC-539-STATION-3	682510.1318	1693494.7872
761	682690.1540	1693966.7430	4138.58	OTC-539-STATION-4	682492.2960	1693475.7957
762	682700.5510	1693984.6270	4139.10	OTC-539-LEACH	682502.6900	1693493.6745
763	682694.7220	1693978.9800	4138.75	OTC-539-LEACH	682496.8627	1693488.0292
764	682685.8570	1693975.5370	4138.62	OTC-539-LEACH	682488.0002	1693484.5872
765	682686.8260	1693963.6500	4138.56	OTC-539-LEACH	682488.9690	1693472.7036
766	682690.9260	1693959.9730	4138.78	OTC-539-LEACH	682493.0678	1693469.0277
767	682696.9840	1693956.9410	4138.94	OTC-539-LEACH	682499.1240	1693465.9966
768	682705.4410	1693958.5980	4139.12	OTC-539-LEACH	682507.5786	1693467.6531
769	682714.7430	1693968.3290	4139.32	OTC-539-LEACH	682516.8779	1693477.3813
770	682721.4010	1693976.8710	4139.30	OTC-539-LEACH	682523.5339	1693485.9208
771	682717.7930	1693983.8070	4139.35	OTC-539-LEACH	682519.9270	1693492.8548
772	682710.1830	1693984.5790	4139.16	OTC-539-FLINE	682512.3192	1693493.6265
773	682710.2190	1693987.2160	4139.18	OTC-539-FLINE	682512.3552	1693496.2628
774	682690.6020	1694039.4720	4139.43	OTC-539-BLDGCOR	682492.7439	1693548.5036
775	682684.8200	1694045.5030	4139.27	OTC-539-BLDGCOR	682486.9635	1693554.5329
776	682741.4000	1694039.0240	4140.22	OTC-539-BLDGCOR	682543.5271	1693548.0558
777	682747.1830	1694045.0970	4140.68	OTC-539-BLDGCOR	682549.3085	1693554.1270

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7824
PROFESSIONAL SURVEYOR

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
778	686068.4560	1686694.7280	4103.68	OTC-534-MW-10-PVC	685869.6189	1686205.8883
779	686068.7800	1686694.7810	4104.06	OTC-534-MW-10-CASING	685869.9428	1686205.9413
780	685846.6180	1686522.2590	4102.52	OTC-534-MW-11-CASING	685647.8452	1686033.4693
781	685846.3620	1686522.2240	4102.15	OTC-534-MW-11-PVC	685647.5893	1686033.4343
782	685670.3280	1686561.9490	4102.29	OTC-534-MW-12-PVC	685471.6063	1686073.1478
783	685670.6410	1686561.9860	4102.69	OTC-534-MW-12-CASING	685471.9192	1686073.1848

RAW DATA

HOLLOMAN AIR FORCE BASE
WEST SITE

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	684793.2210	1611172.5300	3911.93	BASE	684598.9178	1610715.3759
2	682531.9480	1628747.6200	3965.57	EC-30	682338.2864	1628285.4792
3	682452.1330	1628714.0920	3957.20	EC-30-2	682258.4940	1628251.9607
4	698323.2620	1606321.3780	3915.08	CHAS	698125.1198	1605865.6004
5	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
60	616427.1730	1576921.6540	3941.67	LUCERO	616252.2680	1576474.2182
61	600657.7750	1576446.9260	4131.58	GERI	600487.3444	1575999.6249
62	614156.5210	1568701.1170	4227.09	SW 30	613982.2602	1568256.0137
63	575518.1130	1586543.7100	4038.20	BRYCE AZ MK	575354.8155	1586093.5441
64	576512.9440	1582067.6800	4357.70	BRYCE	576349.3642	1581618.7841
65	633185.2600	1566510.7280	4417.64	HORN	633005.6000	1566066.2462
66	580320.9040	1585783.2080	4128.59	NICK 2	580156.2437	1585333.2579
67	682452.1790	1628714.1810	3957.10	EC-30-2	682258.5400	1628252.0496
68	698323.2620	1606321.3780	3914.70	CHAS	698125.1198	1605865.6004
69	698212.0050	1609477.2870	3928.40	CHUCK	698013.8943	1609020.6139
70	682531.9020	1628747.5310	3965.57	EC-30	682338.2404	1628285.3902
71	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
100	684194.1900	1611160.8710	3912.56	USTC-518-NG	684000.0567	1610703.7202
101	684194.8810	1611165.7430	3912.33	USTC-518-NG	684000.7475	1610708.5908
102	684188.7970	1611168.5190	3912.27	USTC-518-NG	683994.6653	1610711.3660
103	684189.4230	1611176.5450	3912.53	USTC-518-NG	683995.2911	1610719.3898
104	684179.6480	1611178.5150	3912.57	USTC-518-NG	683985.5189	1610721.3592
105	684178.1630	1611171.1680	3912.37	USTC-518-NG	683984.0343	1610714.0143
106	684177.1790	1611163.0630	3913.00	USTC-518-NG	683983.0506	1610705.9116
107	684157.6940	1611173.6700	3912.42	USTC-518-STATION-5	683963.5711	1610716.5156
108	684176.2170	1611179.5100	3912.28	USTC-518-STATION-4	683982.0888	1610722.3539
109	684175.8730	1611172.3430	3912.51	USTC-518-STATION-2	683981.7449	1610715.1890
110	684173.8830	1611163.3430	3912.65	USTC-518-STATION-3	683979.7555	1610706.1915
111	684189.5770	1611170.0220	3912.30	USTC-518-STATION-1	683995.4450	1610712.8686
112	684160.3220	1611172.8640	3912.49	USTC-518-POTHOLE-1	683966.1984	1610715.7098
113	684125.1520	1611185.2360	3910.93	USTC-518-MW-1	683931.0383	1610728.0783
114	684130.9190	1611216.0540	3911.17	USTC-518-MW-2	683936.8037	1610758.8876
115	684158.8770	1611187.1610	3912.34	USTC-518-BLDGCORN-70	683964.7538	1610730.0028
116	684163.9700	1611180.4420	3912.46	USTC-518-BLDGCORN-70	683969.8453	1610723.2857
117	684211.6690	1611174.1790	3912.47	USTC-518-BLDGCORN-70	684017.5308	1610717.0244
118	684218.3800	1611179.3060	3912.45	USTC-518-BLDGCORN-70	684024.2399	1610722.1500
119	684236.0190	1611144.8000	3911.88	USTC-518-NAIL	684041.8739	1610687.6538
120	684242.7800	1611133.9130	3911.77	USTC-518-NAIL	684048.6330	1610676.7699
121	684203.7200	1611162.6570	3912.21	USTC-518-STATION-6	684009.5840	1610705.5057

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7924
PROFESSIONAL SURVEYOR

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-069

Appendix H
Laboratory Analytical Data and Data Validation Checklists

Note: The data validation checklists and laboratory analytical data reports are provided as separate files.

Appendix I
Waste Manifests

HAFB-001

Generator's Name	Generator's Address	Generator's Telephone No.
USAF	550 TABOSA AVE Holloman AFB NM 88330	575-491-8262

Origin of Special Waste (Project or Spill Location): ~~White Sands National Monument Park - Storage Lagoons~~ Holloman AFB NM Bldg # 55

Transporter #1 Company Name	Address	Telephone No.
Southwest Disposal	1350 LaVelle Road	575-434-1109
Transporter #2 Company Name	Address	Telephone No.
	Alamogordo, NM 88310	

Destination Facility Name/Site Address	Facility ID (Permit) Number	Telephone No.
Otero/Greentree Regional Landfill 24 Mls South of Alamogordo, Hwy 54	SWM-109102	575-439-4355

Type and Proper Name of Special Waste	Container(s) No.	Container(s) Type	Total Quantity	Unit Wt/Vol	
Non RCRA/Non Hazardous Substance ~~(Treatment Plant Lagoon Sludge)~~ (soil)		SD		6.95	Tons

Additional Descriptions for Special Waste Listed Above:

Site Contact: Todd Hiltunen 307-214-6080

Special Handling Instructions:

Southwest Disposal - Lined and Covered Roll-off

GENERATOR'S CERTIFICATION I hereby certify that the contents of this shipment are fully and accurately described above by type and proper name of the special waste, and that such waste has been managed, packaged, containerized and labeled in accordance with the requirements of 20.9.8 NMAC (Special Waste Requirements) in addition to any other applicable federal, state or local regulations.

Truck # 553 Bin #

Printed/Typed Name:	Signature:	Date:
Todd Hiltunen for Brent Hunt (CES)	for Brent Hunt (CES)	9/25/12

Transporter 1 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:
David Gurnbach		9/26/12

Transporter 2 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:

Discrepancy Indication Space:

Analytical supplied to landfill

no facility ID number

Facility Owner or Operator: ***I hereby acknowledge receipt of the special waste as indicated upon this manifest, except as noted above in the Discrepancy Indication Space.***

Printed/Typed Name:	Signature:	Date:
Darrell McGinnis / Attendant		9-26-12

~~Facility~~

OTERO/GREENTREE
REGIONAL LANDFILL

TRANSACTION: 28,080

CO. NAME:

ADDRESS: Environmental Waste Solutions
1348 B. Redtail Hawk Drive

CITY & STATE: Boardman, OH 44512

DATE: 9/26/12 TIME: 9:07 am

TRUCK NO.: 198

GROSS WEIGHT 47000

TARE WEIGHT: 33100

NET TONS: 13900 6.95

COST $: [redacted]

5% TAX $:

TOTAL DUE $:

WASTE: 5

WASTE DESC.: Construction Debris
H.A.F.B.

WASTE ORIGIN:

DRIVER

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-069

Appendix J
Risk Evaluation Calculations

Risk Additivity
Soil Analytical Data
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC543-IS-0001-070512		OTC543-IS-0002-070512		OTC543-IS-0003-070512		OTC543-IS-0004-070512		OTC543-IS-0005-070512		OTC543-IS-0006-070512		OTC543-IS-0007-070512		OTC543-IS-0008-070512-FD		OTC543-IS-0009-070512		OTC543-IS-0010-070512		OTC543-IS-0011-070512	
				Sample Date	7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		10 - 12		0 - 2		20 - 22	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**68.4**		**81.5**		**71.9**		**84.8**		**75.2**		**76.4**		**81.7**		**85.5**		**81**		**73.1**		**79.3**	
VOLATILES (mg/kg)																										
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.0013	U	0.00097	U	0.0014	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U	0.0017	U	0.074	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0014	U	0.0011	U	0.0016	U	0.0015	U	0.0016	U	0.0016	U	0.0015	U	0.0015	U	0.0016	U	0.0019	U	0.074	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.002	U	0.0015	U	0.0022	U	0.0022	U	0.0022	U	0.0023	U	0.0021	U	0.0021	U	0.0022	U	0.0026	U	0.074	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.0013	U	0.00097	U	0.0014	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U	0.0017	U	0.09	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.0013	U	0.00097	U	0.0014	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U	0.0017	U	0.081	U
1,1-DICHLOROETHENE	NE	240	449		0.0017	U	0.0012	U	0.0018	U	0.0018	U	0.0018	U	0.0019	U	0.0017	U	0.0018	U	0.0019	U	0.0022	U	0.074	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0014	U	0.0011	U	0.0016	U	0.0015	U	0.0016	U	0.0016	U	0.0015	U	0.0015	U	0.0016	U	0.0019	U	0.074	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0027	U	0.002	U	0.003	U	0.0029	U	0.003	U	0.0031	U	0.0028	U	0.0029	U	0.003	U	0.0036	U	0.074	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.0012	U	0.00088	U	0.0013	U	0.0013	U	0.0013	U	0.0013	U	0.0012	U	0.0013	U	0.0013	U	0.0015	U	0.074	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.0013	U	0.00097	U	0.0014	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U	0.0017	U	0.094	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.0012	U	0.00088	U	0.0013	U	0.0013	U	0.0013	U	0.0013	U	0.0012	U	0.0013	U	0.0013	U	0.0015	U	0.074	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0014	U	0.0011	U	0.0016	U	0.0015	U	0.0016	U	0.0016	U	0.0015	U	0.0015	U	0.0016	U	0.0019	U	0.086	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0014	U	0.0011	U	0.0016	UJ	0.0015	U	0.0016	U	0.0016	U	0.0015	U	0.0015	U	0.0016	U	0.0019	U	0.074	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.0013	U	0.00097	U	0.0014	UJ	0.0014	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U	0.0017	U	0.074	U
2-HEXANONE	NE	210	NE		0.0064	U	0.0048	U	0.0071	U	0.0069	U	0.007	U	0.0072	U	0.0067	U	0.0068	U	0.0071	U	0.0083	U	0.006	U
ACETONE	NE	61000	66600		0.024	U	0.018	U	0.026	U	0.026	U	0.026	U	0.027	U	0.025	U	0.025	U	0.026	U	0.031	U	0.022	U
BENZENE	NE	1.1	15.4		0.0018	U	0.0013	U	0.002	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.0019	U	0.002	U	0.0023	U	0.0017	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.0013	U	0.00097	U	0.0014	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U	0.0017	U	0.0012	U
BROMOFORM	NE	62	616		0.0018	U	0.0013	U	0.002	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.0019	U	0.002	U	0.0023	U	0.0017	U
BROMOMETHANE	NE	7.3	16.5		0.0024	U	0.0018	U	0.0026	U	0.0026	U	0.0026	U	0.0027	U	0.0025	U	0.0025	U	0.0026	U	0.0031	U	0.0022	U
CARBON DISULFIDE	NE	820	1530		0.0024	U	0.0018	U	0.0026	U	0.0026	U	0.0026	U	0.0027	U	0.0025	U	0.0025	U	0.0026	U	0.0031	U	0.0022	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0021	U	0.0016	U	0.0024	U	0.0023	U	0.0023	U	0.0024	U	0.0022	U	0.0023	U	0.0024	U	0.0028	U	0.002	U
CHLOROBENZENE	NE	290	376		0.0012	U	0.00088	U	0.0013	U	0.0013	U	0.0013	U	0.0013	U	0.0012	U	0.0013	U	0.0013	U	0.0015	U	0.0011	U
CHLOROETHANE	NE	15000	29800		0.0024	U	0.0018	U	0.0026	U	0.0026	U	0.0026	U	0.0027	U	0.0025	U	0.0025	U	0.0026	U	0.0031	U	0.0022	U
CHLOROFORM	NE	0.29	5.86		0.0014	U	0.0011	U	0.0016	U	0.0015	U	0.0016	U	0.0016	U	0.0015	U	0.0015	U	0.0016	U	0.0019	U	0.0013	U
CHLOROMETHANE	NE	120	275		0.0024	U	0.0018	U	0.0026	U	0.0026	U	0.0026	U	0.0027	U	0.0025	U	0.0025	U	0.0026	U	0.0031	U	0.0022	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0018	U	0.0013	U	0.002	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.0019	U	0.002	U	0.0023	U	0.0017	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0012	U	0.00088	U	0.0013	U	0.0013	U	0.0013	U	0.0013	U	0.0012	U	0.0013	U	0.0013	U	0.0015	U	0.0011	U
CYCLOHEXANE	NE	7000	NE		0.0017	U	0.0012	U	0.0018	U	0.0018	U	0.0018	U	0.0019	U	0.0017	U	0.0018	U	0.0019	U	0.0022	U	0.0015	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.0012	U	0.00088	U	0.0013	U	0.0013	U	0.0013	U	0.0013	U	0.0012	U	0.0013	U	0.0013	U	0.0015	U	0.0011	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0018	U	0.0013	U	0.002	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.0019	U	0.002	U	0.0023	U	0.0017	U
ETHYLBENZENE	NE	5.4	68.4		**0.005**	J	0.00088	U	0.0013	U	0.0013	U	0.0013	U	0.0013	U	0.0012	U	0.0013	U	0.0013	U	0.0015	U	0.0011	U
ISOPROPYLBENZENE	NE	2100	2430		0.0013	U	0.00097	U	0.0014	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U	0.0017	U	0.0012	U
METHYL ACETATE	NE	78000	78200		0.015	U	**0.0427**		0.016	U	0.016	U	0.016	U	0.017	U	0.015	U	0.016	U	0.017	U	0.019	U	0.014	U
METHYL ETHYL KETONE	NE	28000	37100		0.0072	U	0.0054	U	0.008	U	0.0078	U	0.008	U	0.0081	U	0.0076	U	0.0077	U	0.0081	U	0.0094	U	0.0067	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0065	U	0.0048	U	0.0072	U	0.007	U	0.0072	U	0.0073	U	0.0068	U	0.0069	U	0.0073	U	0.0085	U	0.0061	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0015	U	0.0011	U	0.0017	UJ	0.0017	U	0.0017	U	0.0017	U	0.0016	U	0.0016	U	0.0017	U	0.002	U	0.0014	U
METHYLENE CHLORIDE	NE	56	409		0.0055	U	0.0041	U	0.0061	U	0.0059	U	0.006	U	0.0061	U	0.0057	U	0.0058	U	0.0061	U	0.0071	U	0.0051	U

Risk Additivity
Soil Analytical Data
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC543-IS-0001-070512		OTC543-IS-0002-070512		OTC543-IS-0003-070512		OTC543-IS-0004-070512		OTC543-IS-0005-070512		OTC543-IS-0006-070512		OTC543-IS-0007-070512		OTC543-IS-0008-070512-FD		OTC543-IS-0009-070512		OTC543-IS-0010-070512		OTC543-IS-0011-070512	
				Sample Date	7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		10 - 12		0 - 2		20 - 22	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																										
STYRENE	NE	6300	7280		0.0031	U	0.0023	U	0.0034	U	0.0033	U	0.0034	U	0.0035	U	0.0032	U	0.0033	U	0.0034	U	0.004	U	0.0029	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0024	U	0.0018	U	0.0026	U	0.0026	U	0.0026	U	0.0027	U	0.0025	U	0.0025	U	0.0026	U	0.0031	U	0.0022	U
TETRACHLOROETHYLENE	NE	22	7.02		0.0012	U	0.00088	U	0.0013	U	0.0013	U	0.0013	U	0.0013	U	0.0012	U	0.0013	U	0.0013	U	0.0015	U	0.0011	U
TOLUENE	NE	5000	5270		**0.0041**	J	**0.0026**	J	0.0016	U	0.0015	U	0.0016	U	0.0016	U	0.0015	U	0.0015	U	0.0016	U	0.0019	U	0.0013	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0018	U	0.0013	U	0.002	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.0019	U	0.002	U	0.0023	U	0.0017	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0013	U	0.00097	U	0.0014	U	0.0014	U	0.0014	U	0.0015	U	0.0014	U	0.0014	U	0.0015	U	0.0017	U	0.0012	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0014	U	0.0011	U	0.0016	U	0.0015	U	0.0016	U	0.0016	U	0.0015	U	0.0015	U	0.0016	U	0.0019	U	0.0013	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0024	U	0.0018	U	0.0026	U	0.0026	U	0.0026	U	0.0027	U	0.0025	U	0.0025	U	0.0026	U	0.0031	U	0.0022	U
VINYL CHLORIDE	NE	0.06	0.728		0.0018	U	0.0013	U	0.002	U	0.0019	U	0.002	U	0.002	U	0.0019	U	0.0019	U	0.002	U	0.0023	U	0.0017	U
XYLENES, TOTAL	NE	630	814		**0.0252**		0.0028	U	0.0042	UJ	0.0041	U	0.0042	U	0.0043	U	0.004	U	0.004	U	0.0042	U	0.0049	U	0.0035	U
SEMIVOLATILES (mg/kg)																										
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.097	U	0.02	U	0.023	UJ	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	UJ
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
2,4-DICHLOROPHENOL	NE	180	183		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.12	U	0.025	U	0.029	U	0.025	U	0.028	U	0.027	U	0.025	U	0.025	U	0.026	U	0.029	U	0.027	U
2,4-DINITROPHENOL	NE	120	122		1.9	U	0.4	U	0.46	U	0.39	U	0.44	U	0.44	U	0.4	U	0.39	U	0.41	U	0.46	U	0.42	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
2,6-DINITROTOLUENE	NE	61	61.1		0.12	U	0.024	U	0.027	U	0.023	U	0.026	U	0.026	U	0.024	U	0.023	U	0.024	U	0.027	U	0.025	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
2-CHLOROPHENOL	NE	390	391		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
2-METHYLNAPHTHALENE	NE	230	NE		0.097	U	0.02	U	0.023	UJ	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
2-METHYLPHENOL	NE	3100	NE		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
2-NITROANILINE	NE	610	NE		0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
2-NITROPHENOL	NE	NE	NE		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
3-NITROANILINE	NE	NE	NE		0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.39	U	0.081	U	0.092	U	0.078	U	0.088	U	0.087	U	0.08	U	0.078	U	0.082	U	0.092	U	0.085	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
4-CHLOROANILINE	NE	2.4	NE		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
4-NITROANILINE	NE	24	NE		0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
4-NITROPHENOL	NE	NE	NE		0.78	U	0.16	U	0.18	U	0.16	U	0.18	U	0.17	U	0.16	U	0.16	U	0.16	U	0.18	U	0.17	U
ACENAPHTHENE	NE	3400	3440		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
ACENAPHTHYLENE	NE	NE	NE		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
ACETOPHENONE	NE	7800	7820		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
ANTHRACENE	NE	17000	17200		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
ATRAZINE	NE	2.1	NE		0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U

Risk Additivity
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Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC543-IS-0001-070512		OTC543-IS-0002-070512		OTC543-IS-0003-070512		OTC543-IS-0004-070512		OTC543-IS-0005-070512		OTC543-IS-0006-070512		OTC543-IS-0007-070512		OTC543-IS-0008-070512-FD		OTC543-IS-0009-070512		OTC543-IS-0010-070512		OTC543-IS-0011-070512	
				Sample Date	7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		10 - 12		0 - 2		20 - 22	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																										
BENZALDEHYDE	NE	7800	NE	0.97	U	0.2	U	0.23	U	0.19	U	0.22	U	0.22	U	0.2	U	0.19	U	0.21	U	0.23	U	0.21	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
BENZO(A)PYRENE	NE	0.015	0.148	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
BIPHENYL	NE	51	57.1	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	0.39	U	0.081	U	0.092	U	0.078	U	0.088	U	0.087	U	0.08	U	0.078	U	0.082	U	0.092	U	0.085	U
CAPROLACTAM	NE	31000	NE	0.31	U	0.065	U	0.074	UJ	0.062	U	0.07	U	0.07	U	0.064	U	0.062	U	**0.0665**	J	**0.0875**	J	0.068	U
CARBAZOLE	NE	NE	NE	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
CHRYSENE	NE	15	148	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
DIBENZOFURAN	NE	78	NE	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
DIETHYL PHTHALATE	NE	49000	48900	0.39	U	0.081	U	0.092	U	0.078	U	0.088	U	0.087	U	0.08	U	0.078	U	0.082	U	0.092	U	0.085	U
DIMETHYL PHTHALATE	NE	611000	611000	0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.39	U	0.081	U	0.092	U	0.078	U	0.088	U	0.087	U	0.08	U	0.078	U	0.082	U	0.092	U	0.085	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
FLUORANTHENE	NE	2300	2290	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
FLUORENE	NE	2300	2290	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.43	U	0.089	U	0.1	U	0.086	U	0.097	U	0.096	U	0.088	U	0.086	U	0.091	U	0.1	U	0.093	UJ
HEXACHLOROETHANE	NE	12	42.8	0.19	U	0.04	U	0.046	U	0.039	U	0.044	U	0.044	U	0.04	U	0.039	U	0.041	U	0.046	U	0.042	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
ISOPHORONE	NE	510	5120	0.097	UJ	0.02	UJ	0.023	UJ	0.019	UJ	0.022	UJ	0.022	UJ	0.02	UJ	0.019	UJ	0.021	UJ	0.023	UJ	0.021	UJ
M,P-CRESOL	NE	NE	NE	0.14	U	0.029	U	0.033	U	0.028	U	0.032	U	0.031	U	0.029	U	0.028	U	0.03	U	0.033	U	0.03	U
NAPHTHALENE	NE	3.6	43.0	0.16	U	0.032	U	0.037	U	0.031	U	0.035	U	0.035	U	0.032	U	0.031	U	0.033	U	0.037	U	0.034	U
NITROBENZENE	NE	4.8	53.5	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
PENTACHLOROPHENOL	NE	0.89	8.94	1.2	U	0.24	U	0.28	U	0.23	U	0.26	U	0.26	U	0.24	U	0.23	U	0.25	U	0.28	U	0.25	U
PHENANTHRENE	NE	1830	1830	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
PHENOL	NE	18000	18300	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	0.023	U	0.021	U
PYRENE	NE	1700	1720	0.097	U	0.02	U	0.023	U	0.019	U	0.022	U	0.022	U	0.02	U	0.019	U	0.021	U	**0.033**	J	0.021	U

Risk Additivity
Soil Analytical Data
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC543-IS-0001-070512		OTC543-IS-0002-070512		OTC543-IS-0003-070512		OTC543-IS-0004-070512		OTC543-IS-0005-070512		OTC543-IS-0006-070512		OTC543-IS-0007-070512		OTC543-IS-0008-070512-FD		OTC543-IS-0009-070512		OTC543-IS-0010-070512		OTC543-IS-0011-070512	
			Sample Date	7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012	
			Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		10 - 12		0 - 2		20 - 22	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																									
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
1,3-DINITROBENZENE	NE	6.10	NE	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
2,4-DINITROTOLUENE	NE	1.60	15.7	0.078	U	0.094	U	0.08	U	0.079	U	0.088	U	0.083	U	0.085	U	0.079	U	0.083	U	0.09	U	0.075	U
2,6-DINITROTOLUENE	NE	61.0	61.1	0.07	U	0.084	U	0.072	U	0.071	U	0.079	U	0.074	U	0.077	U	0.07	U	0.074	U	0.081	U	0.067	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
2-NITROTOLUENE	NE	2.90	29.1	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
3-NITROTOLUENE	NE	6.10	7.82	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
4-NITROTOLUENE	NE	30.0	244.4	0.081	U	0.098	U	0.083	U	0.082	U	0.092	U	0.086	U	0.089	U	0.082	U	0.086	U	0.094	U	0.078	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
NITROBENZENE	NE	4.80	53.5	0.075	U	0.09	U	0.077	U	0.076	U	0.085	U	0.079	U	0.082	U	0.075	U	0.079	U	0.086	U	0.072	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
TETRYL	NE	240.0	244.0	0.065	U	0.078	U	0.066	U	0.065	U	0.073	U	0.068	U	0.07	U	0.065	U	0.068	U	0.074	U	0.062	U
METALS (mg/kg)																									
ALUMINUM	13722	77000	78000	**5770**		**1770**		**1180**		**6810**		**5840**		**884**		**3670**		**929**		**1360**		**3240**		**2430**	
ANTIMONY	1.6	31	31.3	1.2	U	0.9	U	1.1	UJ	0.78	U	1.3	U	0.99	U	0.9	U	**4.3**	J	1.1	U	1.2	U	0.91	U
ARSENIC	3.7	0.39	3.90	**1.8**	J	0.9	U	1.1	U	**1.9**	J	1.3	U	0.99	U	0.9	U	0.84	U	1.1	U	1.2	U	0.91	U
BARIUM	169.3	15000	15600	**77.4**	J	**17.2**	J	**18.3**	J	**68.5**	J	**58.2**	J	**17.1**	J	**43.4**	J	**12.7**	J	**16.3**	J	**41.2**	J	**25.9**	J
BERYLLIUM	1.6	160	156	0.6	U	0.45	U	0.55	U	0.39	U	0.63	U	0.5	U	0.45	U	0.42	U	0.55	U	0.59	U	0.46	U
CADMIUM	0.3	70	70.3	0.6	U	0.45	U	0.55	U	0.39	U	0.63	U	0.5	U	0.45	U	0.84	U	0.55	U	0.59	U	0.46	U
CALCIUM	317332	NE	NE	**272000**		**196000**		**251000**		**108000**		**226000**		**246000**		**228000**		**252000**		**248000**		**277000**		**189000**	
CHROMIUM[d]	25	117000	117000	**6.4**		**1.8**	J	**0.95**	J	**6.5**		**5.4**	J	**0.74**	J	**3.2**	J	0.84	U	**1.2**	J	**3.1**	J	**3.1**	J
COBALT	7.7	23	NE	**2**	J	**0.49**	J	**0.56**	J	**2.7**	J	**1.8**	J	0.5	U	**1.2**	J	0.42	U	0.55	U	**1.1**	J	**0.85**	J
COPPER	13	3100	3130	**4.4**	J	0.9	U	1.1	U	**3.1**	J	**3.9**	J	0.99	U	**2.6**	J	0.84	U	1.1	U	**2.9**	J	**1.5**	J
IRON	23049	55000	54800	**5200**		**1660**		**1190**		**7120**		**5270**		**740**		**3300**		**880**		**1230**		**3080**		**2700**	
LEAD	10.9	400	400	**2.8**	J	**0.84**	J	**0.61**	J	**3.5**	J	**2.8**	J	0.5	U	**1.4**	J	0.84	U	**0.57**	J	**2**	J	**1.2**	J
MAGNESIUM	16991	NE	NE	**10900**		**889**	J	**674**	J	**3680**		**11100**		**922**	J	**7200**		**636**	J	**930**	J	**5280**		**2040**	J
MANGANESE	393	1800	1860	**104**		**23.6**		**15.4**		**95.7**		**115**		**14.6**		**75.9**		**12.9**		**15.1**		**79.3**		**28.8**	
MERCURY	0.0108	10	15.6	0.012	U	0.01	U	0.011	U	0.0091	U	0.01	U	0.0098	U	0.0096	U	0.0096	U	0.01	U	0.011	U	0.0099	U
NICKEL	17.4	1500	1560	**4.7**	J	**1**	J	**1**	J	**6.1**	J	**4.2**	J	**0.91**	J	**2.7**	J	**0.56**	J	**0.77**	J	**2.6**	J	**2**	J
POTASSIUM	5077	NE	NE	**1430**	J	**469**	J	**316**	J	**1610**	J	**1430**	J	**258**	J	**1080**	J	**299**	J	**438**	J	**1000**	J	**652**	J
SELENIUM	1.4	390	391	2.4	U	1.8	U	2.2	U	1.6	U	2.5	U	2	U	1.8	U	3.3	U	2.2	U	2.4	U	1.8	U
SILVER	1.1	390	391	0.6	U	0.45	U	0.55	U	0.39	U	0.63	U	0.5	U	0.45	U	0.42	U	0.55	U	0.59	U	0.46	U
SODIUM	5196	NE	NE	660	U	500	U	610	U	430	U	690	U	550	U	**1370**	J	460	U	600	U	**1470**	J	500	U
THALLIUM	1.3	0.78	0.782	1.6	U	1.2	U	1.4	U	1	U	1.6	U	1.3	U	1.2	U	2.2	U	1.4	U	1.5	U	1.2	U
VANADIUM	42.6	390	391	**13.3**	J	**3.1**	J	**2.9**	J	**15.5**	J	**12.1**	J	**2.2**	J	**7**	J	**1.9**	J	**2.8**	J	**6.5**	J	**7.3**	J
ZINC	54.6	23000	23500	**13.9**		**3.8**	J	**3.2**	J	**14.7**		**13.6**		2.5	U	**8.1**	J	4.2	U	2.7	U	**8.7**	J	**6.9**	J

Risk Additivity
Soil Analytical Data
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC543-IS-0001-070512		OTC543-IS-0002-070512		OTC543-IS-0003-070512		OTC543-IS-0004-070512		OTC543-IS-0005-070512		OTC543-IS-0006-070512		OTC543-IS-0007-070512		OTC543-IS-0008-070512-FD		OTC543-IS-0009-070512		OTC543-IS-0010-070512		OTC543-IS-0011-070512	
			Sample Date	7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012	
			Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
			Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		10 - 12		10 - 12		0 - 2		20 - 22	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																									
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	0.0097	U	0.0082	U	0.0093	U	0.0079	U	0.0088	U	0.0086	U	0.008	U	0.0078	U	0.0082	U	0.0091	U	0.0083	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	0.012	U	0.01	U	0.012	U	0.0099	U	0.011	U	0.011	U	0.01	U	0.0097	U	0.01	U	0.011	U	0.01	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	0.012	U	0.01	U	0.012	U	0.0099	U	0.011	U	0.011	U	0.01	U	0.0097	U	0.01	U	0.011	U	0.01	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	0.0097	U	0.0082	U	0.0093	U	0.0079	U	0.0088	U	0.0086	U	0.008	U	0.0078	U	0.0082	U	0.0091	U	0.0083	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	0.0097	U	0.0082	U	0.0093	U	0.0079	U	0.0088	U	0.0086	U	0.008	U	0.0078	U	0.0082	U	0.0091	U	0.0083	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	0.0097	U	0.0082	U	0.0093	U	0.0079	U	0.0088	U	0.0086	U	0.008	U	0.0078	U	0.0082	U	0.0091	U	0.0083	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	0.0097	U	0.0082	U	0.0093	U	0.0079	U	0.0088	U	0.0086	U	0.008	U	0.0078	U	0.0082	U	0.0091	U	0.0083	U
PETROLEUM HYDROCARBONS (mg/kg)																									
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	4.1	U	3.6	U	4	U	4.1	U	4.8	U	4.7	U	5.3	U	4	U	4.4	U	5.2	U	3.2	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	**12.3**		**5.76**	J	4.6	U	3.9	U	4.4	U	**5.38**	J	4.1	U	3.9	U	4.1	U	**23.7**		**13.3**	
OIL RANGE ORGANICS C28-C40	NE	NE	1000	**45.9**		**14.3**		4.6	U	3.9	U	**4.81**	J	**4.69**	J	4.1	U	3.9	U	4.1	U	**23.7**		**10.2**	J
CYANIDE (mg/kg)																									
CYANIDE	NE	22.0	46.9	0.086	U	0.071	U	0.08	U	0.068	U	0.078	U	0.076	U	0.072	U	0.07	U	0.074	U	0.082	U	0.073	U
TRITIUM (pCi/g)																									
TRITIUM	NE	NE	NE	5.89	U	5.99	U	5.64	U	5.63	U	5.89	U	5.57	U	5.84	U	5.24	U	5.69	U	5.77	U	5.71	U

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Analyte			Sample Number					
			Sample Date					
			Location					
			Depth (ft bgs)					
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**					
PERCENT SOLIDS	NE	NE	NE					
VOLATILES (mg/kg)								
1,1,1-TRICHLOROETHANE	NE	8700	15600					
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02					
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100					
1,1,2-TRICHLOROETHANE	NE	1.1	2.81					
1,1-DICHLOROETHANE	NE	3.3	64.5					
1,1-DICHLOROETHENE	NE	240	449					
1,2,4-TRICHLOROBENZENE	NE	22	73.0					
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86					
1,2-DIBROMOETHANE	NE	0.034	0.588					
1,2-DICHLOROBENZENE	NE	1900	2310					
1,2-DICHLOROETHANE	NE	0.43	7.89					
1,2-DICHLOROPROPANE	NE	0.94	15.2					
1,3-DICHLOROBENZENE	NE	NE	NE					
1,4-DICHLOROBENZENE	NE	2.4	31.7					
2-HEXANONE	NE	210	NE					
ACETONE	NE	61000	66600					
BENZENE	NE	1.1	15.4					
BROMODICHLOROMETHANE	NE	0.27	5.41					
BROMOFORM	NE	62	616					
BROMOMETHANE	NE	7.3	16.5					
CARBON DISULFIDE	NE	820	1530					
CARBON TETRACHLORIDE	NE	0.61	10.8					
CHLOROBENZENE	NE	290	376					
CHLOROETHANE	NE	15000	29800					
CHLOROFORM	NE	0.29	5.86					
CHLOROMETHANE	NE	120	275					
CIS-1,2-DICHLOROETHYLENE	NE	160	156					
CIS-1,3-DICHLOROPROPENE	NE	NE	NE					
CYCLOHEXANE	NE	7000	NE					
DIBROMOCHLOROMETHANE	NE	0.68	12.1					
DICHLORODIFLUOROMETHANE	NE	94	168					
ETHYLBENZENE	NE	5.4	68.4					
ISOPROPYLBENZENE	NE	2100	2430					
METHYL ACETATE	NE	78000	78200					
METHYL ETHYL KETONE	NE	28000	37100					
METHYL ISOBUTYL KETONE	NE	5300	5820					
METHYLCYCLOHEXANE	NE	5630	5630					
METHYLENE CHLORIDE	NE	56	409					

Risk Additivity Evaluation at Building 1175, Holloman AFB

		0-10 ft bgs		
Analyte	**C / N**	**Max Hit (mg/kg)**	**Cancer Risk**	**NC ratio**
1,1,1-TRICHLOROETHANE		ND		
1,1,2,2-TETRACHLOROETHANE		ND		
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND		
1,1,2-TRICHLOROETHANE		ND		
1,1-DICHLOROETHANE		ND		
1,1-DICHLOROETHENE		ND		
1,2,4-TRICHLOROBENZENE		ND		
1,2-DIBROMO-3-CHLOROPROPANE		ND		
1,2-DIBROMOETHANE		ND		
1,2-DICHLOROBENZENE		ND		
1,2-DICHLOROETHANE		ND		
1,2-DICHLOROPROPANE		ND		
1,3-DICHLOROBENZENE		ND		
1,4-DICHLOROBENZENE		ND		
2-HEXANONE		ND		
ACETONE		ND		
BENZENE		ND		
BROMODICHLOROMETHANE		ND		
BROMOFORM		ND		
BROMOMETHANE		ND		
CARBON DISULFIDE		ND		
CARBON TETRACHLORIDE		ND		
CHLOROBENZENE		ND		
CHLOROETHANE		ND		
CHLOROFORM		ND		
CHLOROMETHANE		ND		
CIS-1,2-DICHLOROETHYLENE		ND		
CIS-1,3-DICHLOROPROPENE		ND		
CYCLOHEXANE		ND		
DIBROMOCHLOROMETHANE		ND		
DICHLORODIFLUOROMETHANE		ND		
ETHYLBENZENE	C	0.005	7.30E-10	
ISOPROPYLBENZENE		ND		
METHYL ACETATE		ND		
METHYL ETHYL KETONE		ND		
METHYL ISOBUTYL KETONE		ND		
METHYLCYCLOHEXANE		ND		
METHYLENE CHLORIDE		ND		

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Analyte			Sample Number		Risk Additivity Evaluation at Building 1175, Holloman AFB				
			Sample Date						
			Location						
			Depth (ft bgs)				0-10 ft bgs		
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]		Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
VOLATILES - continued (mg/kg)					VOLATILES - continued (mg/kg)				
STYRENE	NE	6300	7280		STYRENE		ND		
TERT-BUTYL METHYL ETHER	NE	43	901		TERT-BUTYL METHYL ETHER		ND		
TETRACHLOROETHYLENE	NE	22	7.02		TETRACHLOROETHYLENE		ND		
TOLUENE	NE	5000	5270		TOLUENE	N	0.0041		0.00000078
TRANS-1,2-DICHLOROETHENE	NE	150	270		TRANS-1,2-DICHLOROETHENE		0.0023		
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		TRANS-1,3-DICHLOROPROPENE		ND		
TRICHLOROETHYLENE	NE	0.91	8.77		TRICHLOROETHYLENE		ND		
TRICHLOROFLUOROMETHANE	NE	790	1410		TRICHLOROFLUOROMETHANE		ND		
VINYL CHLORIDE	NE	0.06	0.728		VINYL CHLORIDE		ND		
XYLENES, TOTAL	NE	630	814		XYLENES, TOTAL	N	0.0252		0.000031
SEMIVOLATILES (mg/kg)					SEMIVOLATILES (mg/kg)				
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		2,2'-OXYBIS(1-CHLORO)PROPANE		ND		
2,4,5-TRICHLOROPHENOL	NE	6100	6110		2,4,5-TRICHLOROPHENOL		ND		
2,4,6-TRICHLOROPHENOL	NE	44	61.1		2,4,6-TRICHLOROPHENOL		ND		
2,4-DICHLOROPHENOL	NE	180	183		2,4-DICHLOROPHENOL		ND		
2,4-DIMETHYLPHENOL	NE	1200	1220		2,4-DIMETHYLPHENOL		ND		
2,4-DINITROPHENOL	NE	120	122		2,4-DINITROPHENOL		ND		
2,4-DINITROTOLUENE	NE	1.6	15.7		2,4-DINITROTOLUENE		ND		
2,6-DINITROTOLUENE	NE	61	61.1		2,6-DINITROTOLUENE		ND		
2-CHLORONAPHTHALENE	NE	6300	6260		2-CHLORONAPHTHALENE		ND		
2-CHLOROPHENOL	NE	390	391		2-CHLOROPHENOL		ND		
2-METHYLNAPHTHALENE	NE	230	NE		2-METHYLNAPHTHALENE		ND		
2-METHYLPHENOL	NE	3100	NE		2-METHYLPHENOL		ND		
2-NITROANILINE	NE	610	NE		2-NITROANILINE		ND		
2-NITROPHENOL	NE	NE	NE		2-NITROPHENOL		ND		
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		3,3'-DICHLOROBENZIDINE		ND		
3-NITROANILINE	NE	NE	NE		3-NITROANILINE		ND		
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		4,6-DINITRO-2-METHYLPHENOL		ND		
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		4-BROMOPHENYL PHENYL ETHER		ND		
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		4-CHLORO-3-METHYLPHENOL		ND		
4-CHLOROANILINE	NE	2.4	NE		4-CHLOROANILINE		ND		
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		4-CHLOROPHENYL PHENYL ETHER		ND		
4-NITROANILINE	NE	24	NE		4-NITROANILINE		ND		
4-NITROPHENOL	NE	NE	NE		4-NITROPHENOL		ND		
ACENAPHTHENE	NE	3400	3440		ACENAPHTHENE		ND		
ACENAPHTHYLENE	NE	NE	NE		ACENAPHTHYLENE		ND		
ACETOPHENONE	NE	7800	7820		ACETOPHENONE		ND		
ANTHRACENE	NE	17000	17200		ANTHRACENE		ND		
ATRAZINE	NE	2.1	NE		ATRAZINE		ND		

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Analyte			Sample Number	Risk Additivity Evaluation at Building 1175, Holloman AFB					
			Sample Date						
			Location						
			Depth (ft bgs)			0-10 ft bgs			
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio	
SEMIVOLATILES - continued (mg/kg)				SEMIVOLATILES - continued (mg/kg)					
BENZALDEHYDE	NE	7800	NE	BENZALDEHYDE		ND			
BENZO(A)ANTHRACENE	NE	0.15	1.48	BENZO(A)ANTHRACENE		ND			
BENZO(A)PYRENE	NE	0.015	0.148	BENZO(A)PYRENE		ND			
BENZO(B)FLUORANTHENE	NE	0.15	1.48	BENZO(B)FLUORANTHENE		ND			
BENZO(G,H,I)PERYLENE	NE	NE	NE	BENZO(G,H,I)PERYLENE		ND			
BENZO(K)FLUORANTHENE	NE	1.5	14.8	BENZO(K)FLUORANTHENE		ND			
BENZYL BUTYL PHTHALATE	NE	260	NE	BENZYL BUTYL PHTHALATE		ND			
BIPHENYL	NE	51	57.1	BIPHENYL		ND			
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	BIS(2-CHLOROETHOXY) METHANE		ND			
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	BIS(2-CHLOROETHYL) ETHER		ND			
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	BIS(2-ETHYLHEXYL) PHTHALATE		ND			
CAPROLACTAM	NE	31000	NE	CAPROLACTAM	N	0.0875		0.0000028	RSL
CARBAZOLE	NE	NE	NE	CARBAZOLE		ND			
CHRYSENE	NE	15	148	CHRYSENE		ND			
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	DIBENZ(A,H)ANTHRACENE		ND			
DIBENZOFURAN	NE	78	NE	DIBENZOFURAN		ND			
DIETHYL PHTHALATE	NE	49000	48900	DIETHYL PHTHALATE		ND			
DIMETHYL PHTHALATE	NE	611000	611000	DIMETHYL PHTHALATE		ND			
DI-N-BUTYL PHTHALATE	NE	6100	6110	DI-N-BUTYL PHTHALATE		ND			
DI-N-OCTYLPHTHALATE	NE	730	NE	DI-N-OCTYLPHTHALATE		ND			
FLUORANTHENE	NE	2300	2290	FLUORANTHENE		ND			
FLUORENE	NE	2300	2290	FLUORENE		ND			
HEXACHLOROBENZENE	NE	0.3	3.04	HEXACHLOROBENZENE		ND			
HEXACHLOROBUTADIENE	NE	6.2	61.1	HEXACHLOROBUTADIENE		ND			
HEXACHLOROCYCLOPENTADIENE	NE	370	367	HEXACHLOROCYCLOPENTADIENE		ND			
HEXACHLOROETHANE	NE	12	42.8	HEXACHLOROETHANE		ND			
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	INDENO(1,2,3-C,D)PYRENE		ND			
ISOPHORONE	NE	510	5120	ISOPHORONE		ND			
M,P-CRESOL	NE	NE	NE	M,P-CRESOL		ND			
NAPHTHALENE	NE	3.6	43.0	NAPHTHALENE		ND			
NITROBENZENE	NE	4.8	53.5	NITROBENZENE		ND			
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	N-NITROSODI-N-PROPYLAMINE		ND			
N-NITROSODIPHENYLAMINE	NE	99	993	N-NITROSODIPHENYLAMINE		ND			
PENTACHLOROPHENOL	NE	0.89	8.94	PENTACHLOROPHENOL		ND			
PHENANTHRENE	NE	1830	1830	PHENANTHRENE		ND			
PHENOL	NE	18000	18300	PHENOL		ND			
PYRENE	NE	1700	1720	PYRENE	N	0.033		0.000019	

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Analyte			Sample Number		Risk Additivity Evaluation at Building 1175, Holloman AFB					
			Sample Date							
			Location							
			Depth (ft bgs)				0-10 ft bgs			
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]		Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio	
EXPLOSIVES (mg/kg)					EXPLOSIVES (mg/kg)					
1,3,5-TRINITROBENZENE	NE	2200.0	NE		1,3,5-TRINITROBENZENE		ND			
1,3-DINITROBENZENE	NE	6.10	NE		1,3-DINITROBENZENE		ND			
2,4,6-TRINITROTOLUENE	NE	19.0	39.1		2,4,6-TRINITROTOLUENE		ND			
2,4-DINITROTOLUENE	NE	1.60	15.7		2,4-DINITROTOLUENE		ND			
2,6-DINITROTOLUENE	NE	61.0	61.1		2,6-DINITROTOLUENE		ND			
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE		2-AMINO-4,6-DINITROTOLUENE		ND			
2-NITROTOLUENE	NE	2.90	29.1		2-NITROTOLUENE		ND			
3-NITROTOLUENE	NE	6.10	7.82		3-NITROTOLUENE		ND			
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE		4-AMINO-2,6-DINITROTOLUENE		ND			
4-NITROTOLUENE	NE	30.0	244.4		4-NITROTOLUENE		ND			
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2		HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE		ND			
NITROBENZENE	NE	4.80	53.5		NITROBENZENE		ND			
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7		OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZO		ND			
TETRYL	NE	240.0	244.0		TETRYL		ND			
METALS (mg/kg)					METALS (mg/kg)					
ALUMINUM	13722	77000	78000		ALUMINUM	N	5840		0.075	
ANTIMONY	1.6	31	31.3		ANTIMONY		ND			
ARSENIC	3.7	0.39	3.90		ARSENIC	C	1.8	4.62E-06		
BARIUM	169.3	15000	15600		BARIUM	N	77.4		0.0050	
BERYLLIUM	1.6	160	156		BERYLLIUM		ND			
CADMIUM	0.3	70	70.3		CADMIUM		ND			
CALCIUM	317332	NE	NE		CALCIUM	NUTRIENT	277000			
CHROMIUM[d]	25	117000	117000		CHROMIUMd	N	6.4		0.000055	
COBALT	7.7	23	NE		COBALT	N	2		0.087	RSL
COPPER	13	3100	3130		COPPER	N	4.4		0.0014	
IRON	23049	55000	54800		IRON	N	5270		0.10	
LEAD	10.9	400	400		LEAD	N	2.8		0.007	
MAGNESIUM	16991	NE	NE		MAGNESIUM	NUTRIENT	11100			
MANGANESE	393	1800	1860		MANGANESE	N	115		0.062	
MERCURY	0.0108	10	15.6		MERCURY		ND			
NICKEL	17.4	1500	1560		NICKEL	N	4.7		0.0030	
POTASSIUM	5077	NE	NE		POTASSIUM	NUTRIENT	1430			
SELENIUM	1.4	390	391		SELENIUM		ND			
SILVER	1.1	390	391		SILVER		ND			
SODIUM	5196	NE	NE		SODIUM	NUTRIENT	1470			
THALLIUM	1.3	0.78	0.782		THALLIUM		ND			
VANADIUM	42.6	390	391		VANADIUM	N	13.3		0.034	
ZINC	54.6	23000	23500		ZINC	N	13.9		0.00059	

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Analyte			Sample Number	
			Sample Date	
			Location	
			Depth (ft bgs)	
	Background Values - Soil (mg/kg)[a]	**EPA RSL - Residential Soil (mg/kg)[b]**	**NMED SSL - Residential Soil (mg/kg)[c]**	
PCBs (mg/kg)				
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	
PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	
OIL RANGE ORGANICS C28-C40	NE	NE	1000	
CYANIDE (mg/kg)				
CYANIDE	NE	22.0	46.9	
TRITIUM (pCi/g)				
TRITIUM	NE	NE	NE	

Risk Additivity Evaluation at Building 1175, Holloman AFB

			0-10 ft bgs		
Analyte	**C / N**		**Max Hit (mg/kg)**	**Cancer Risk**	**NC ratio**
PCBs (mg/kg)					
PCB-1016 (AROCLOR 1016)			ND		
PCB-1221 (AROCLOR 1221)			ND		
PCB-1232 (AROCLOR 1232)			ND		
PCB-1242 (AROCLOR 1242)			ND		
PCB-1248 (AROCLOR 1248)			ND		
PCB-1254 (AROCLOR 1254)			ND		
PCB-1260 (AROCLOR 1260)			ND		
PETROLEUM HYDROCARBONS (mg/kg)					
GASOLINE RANGE ORGANICS C6-C10			ND		
DIESEL RANGE ORGANICS C10-C28	N		23.7		0.0237
OIL RANGE ORGANICS C28-C40	N		45.9		0.0459
CYANIDE (mg/kg)					
CYANIDE			ND		
TRITIUM (pCi/g)					
TRITIUM			ND		
SUM:			**4.6E-06**		**0.44**

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Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," letter to D. Scruggs, Chief, Environmental Restoration Program, Holloman Air Force Base from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, New Mexico Environment Department, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

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Appendix K
Ecological Evaluation

NEW MEXICO ENVIRONMENT DEPARTMENT
SITE ASSESSMENT CHECKLIST
(From NMED (2012) Attachment A)

I. SITE LOCATION

1. Site Name: Building 1175 (OT-C543) Inactive Septic System
   US EPA I.D. Number: NM6572124422
   Location: Tularosa Basin within Holloman Air Force Base (HAFB)
   County: Otero
   City: HAFB _____ State: NM

2. Latitude: 32º 53´ 4.977˝ N Longitude: 106º 9´ 1.735˝ W

3. Attach site maps, including a topographical map, a diagram which illustrates the layout of the facility (e.g., site boundaries, structures, etc.), and maps showing all habitat areas identified in Section III of the checklist. Also, include maps which illustrate known release areas, sampling locations, and any other important features, if available.

Note: Site maps and supporting information that include (1) a Physiographic Map, (2) a Site Layout and Sampling Location Map, and (3) a Site Photo Log are generally included for all sites in the RFI reports. A site habitat map and a Google Earth photo that shows the site habitat are attached to this Site Assessment checklist.

II. SITE CHARACTERIZATION

1. Indicate the approximate area of the site (i.e., acres or sq. ft): Approximately 1 acre

2. Provide an approximate breakdown of the land uses on the site:

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	_____% Undisturbed	100% Other[c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, etc.):
_____

[b]For agricultural areas, please list the crops and/or livestock which are present:
_____

[c]For areas designated as "other", please describe the usage of the area:
According to information in the Voluntary Corrective Measure Request Report (Shaw, 2012), Building 1175 is part of the Test Track buildings and was connected to the sewer system in 1995. The septic system associated with Building 1175 was constructed in 1949, with the tank having a capacity of 2,970 gallons.

3. Provide an approximate breakdown of the land uses in the area surrounding the site. Indicate the radius (in miles) of the area described: approximately 0.5 mile

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	_~50_% Undisturbed	~50 % Other [c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, golf course, etc.):

---

[b]For agricultural areas, please list the crops and/or livestock which are present:

---

[c]For areas designated as "other", please describe the usage of the area:
Habitat Map for Holloman AFB (attached Figure 1) shows that habitat within 0.5 mile radius contains approximately 25 percent classified as "Development/Ground Disturbance." South of the site, another 25 percent is classified as barren alkali playa.

4. Describe reasonable and likely future land and/or water use(s) at the site.
Land use is likely to remain the same.

5. Describe the historical uses of the site. Include information on chemical releases that may have occurred as a result of previous land uses. For each chemical release, provide information on the form of the chemical released (i.e., solid, liquid, vapor) and the known or suspected causes or mechanism of the release (i.e., spills, leaks, material disposal, dumping, explosion, etc.).

Building 1175 is located at the south end of the High Speed Test Track, and is closely associated with activities that occurred at the test track. Any releases that occurred at the site result from leaks associated with the former septic system.

6. If any movement of soil has taken place at the site, describe the degree of the disturbance. Indicate the likely source of any disturbances (e.g., erosion, agricultural, mining, industrial activities, removals, etc.) and estimate when these events occurred.

Site disturbances of soil have been limited to excavation activities associated with building construction and septic system installation and septic system closure activities.

7. Describe the current uses of the site. Include information on recent (previous 5 years) disturbances or chemical releases that have occurred. For each chemical release, provide information on the form of the chemical released and the causes or mechanism of the release.

Building 1175 is located at the south end of the High Speed Test Track, and is closely associated with activities that occurred at the test track.. Current site usage is the same.

8. Identify the location or suspected location of chemical releases at the site. Provide an estimate of the distance between these locations and the areas identified in Section III.

Chemical releases that may have occurred are associated with septic system leakage.

9. Identify the suspected contaminants of concern (COCs) at the site. If known, include the maximum contaminant levels. Please indicate the source of data cited (e.g., RFI, confirmatory sampling, etc.).

As documented in the RFI, detected constituents from soil samples collected include several metals, two SVOCs, and three VOCs and petroleum hydrocarbons (both diesel and oil range). Additionally, samples were analyzed for explosives, PCBs, cyanide, and tritium; however all were non-detect in soil samples from the site (for 0 to 10 feet bgs, the zone of interest for ecological receptors).

10. Identify the media (e.g., soil (surface or subsurface), surface water, air, groundwater) which are known or suspected to contain COCs.
Surface and subsurface soil, and potentially, groundwater

11. Indicate the approximate depth to groundwater (in feet below ground surface [(bgs)].

Depth to groundwater as measured from monitoring well OTC543-MW01 is 22.1 feet from top of PVC casing.

12. Indicate the direction of groundwater flow (e.g., north, southeast, etc.)

According to Figure 2-3 of the RFI report, the direction of groundwater flow at Holloman AFB has been shown to be generally from northeast to southwest. The groundwater flow direction at Building 1175 is to the southeast.

III. HABITAT EVALUATION

III.A Wetland Habitats

Are any wetland[1] areas such as marshes or swamps on or adjacent to the site?

☐ Yes X No

If yes, indicate the wetland area on the attached site map and answer the following questions regarding the wetland area. If more than one wetland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wetland area. Distinguish between wetland areas by using names or other designations (such as location), and clearly identify each area on the site map. Also, obtain and attach a National Wetlands Inventory Map (or maps) to illustrate each wetland area.

Identify the sources of the observations and information (e.g., National Wetland Inventory, Federal or State Agency, USGS topographic maps) used to make the determination that wetland areas are or are not present.

USGS Topographic Maps

If no wetland areas are present, proceed to Section III.B.

1Wetlands are defined in 40 CFR §232.2 as " Areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Examples of typical wetlands plants include: cattails, cordgrass, willows and cypress trees. National wetland inventory maps may be available at http:\\nwi.fws.gov. Additional information on wetland delineation criteria is also available from the Army Corps of Engineers.

Wetland Area Questions

☐Onsite ☐Offsite

Name or
Designation:_____

1. Indicate the approximate area of the wetland (acres or ft^2)_____

2. Identify the type(s) of vegetation present in the wetland.

   - ❑ Submergent (i.e., underwater) vegetation
   - ❑ Emergent (i.e., rooted in the water, but rising above it) vegetation
   - ❑ Floating vegetation
   - ❑ Scrub/shrub
   - ❑ Wooded
   - ❑ Other (Please describe):_____

3. Estimate the vegetation density of the wetland area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Is standing water present? ☐Yes ☐No

   If yes, is the water primarily: ☐Fresh or ☐Brackish
   Indicate the approximate area of the standing water (ft^2): _____
   Indicate the approximate depth of the standing water, if known (ft. or in.)_____

5. If known, indicate the source of the water in the wetland.

   - ❑ Stream/River/Creek/Lake/Pond
   - ❑ Flooding
   - ❑ Groundwater
   - ❑ Surface runoff

6. Is there a discharge from the facility to the wetland? ☐Yes ☐No

   If yes, please
   describe:_____
   _____
   _____
   _____
   _____

Wetland Area Questions (Continued)

7. Is there a discharge from the wetland? ☐Yes ☐No
   If yes, indicate the type of aquatic feature the wetland discharges into:

   - ❑ Surface stream/River (Name:_____)
   - ❑ Lake/Pond (Name:_____)
   - ❑ Groundwater
   - ❑ Not sure

8. Does the area show evidence of flooding? ☐Yes ☐No
   If yes, indicate which of the following are present (mark all that apply):

   - ❑ Standing water
   - ❑ Water-saturated soils
   - ❑ Water marks
   - ❑ Buttressing
   - ❑ Debris lines
   - ❑ Mud cracks
   - ❑ Other (Please describe):_____

9. Animals observed in the wetland area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:
   _____
   _____
   _____
   _____

III.B Aquatic Habitats

III.B.1 Non-Flowing Aquatic Features

Are any non-flowing aquatic features (such as ponds or lakes) located at or adjacent to the site?

☐Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the non-flowing aquatic features. If more than one non-flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.B.2.

Non-Flowing Aquatic Feature Questions

☐Onsite ☐Offsite

Name or Designation:_____

1. Indicate the type of aquatic feature present:

   - ❑ Natural (e.g., pond or lake)
   - ❑ Man-made (e.g., impoundment, lagoon, canal, etc.)

2. Estimate the approximate size of the water body (in acres or sq. ft.)_____

3. If known, indicate the depth of the water body (in ft. or in.)._____

Non-Flowing Aquatic Feature Questions (Continued)

4. Indicate the general composition of the bottom substrate. Mark all sources that apply from the following list.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

☐ Other (please specify):_____

5. Indicate the source(s) of the water in the aquatic feature. Mark all sources that apply from the following list.

- ❑ River/Stream/Creek
- ❑ Groundwater
- ❑ Industrial Discharge
- ❑ Surface Runoff
- ❑ Other (please specify):_____

6. Is there a discharge from the facility to the aquatic feature? ☐Yes ☐No
   If yes, describe the origin of each discharge and its migration path:
   _____
   _____
   _____
   _____

7. Does the aquatic feature discharge to the surrounding environment? ☐Yes ☐ No
   If yes, indicate the features from the following list into which the aquatic feature discharges, and indicate whether the discharge occurs onsite or offsite:

- ❑ River/Stream/Creek ☐onsite ☐offsite
- ❑ Groundwater ☐onsite ☐offsite
- ❑ Wetland ☐onsite ☐offsite
- ❑ Impoundment ☐onsite ☐offsite
- ❑ Other (please describe)_____

Non-Flowing Aquatic Feature Questions (Continued)

8. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Fish
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, turtles)
- ❑ Amphibians (e.g., frogs, salamanders)
- ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

Specify species, if known:

_____
_____
_____
_____

III.B.2 Flowing Aquatic Features

Are any flowing aquatic features (such as streams or rivers) located at or adjacent to the site?

☐Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the flowing aquatic features. If more than one flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map

If no, proceed to Section III.C.

Flowing Aquatic Feature Questions

☐Onsite ☐Offsite

Name or Designation:_____

1. Indicate the type of flowing aquatic feature present.

   - ❑ River
   - ❑ Stream
   - ❑ Creek
   - ❑ Brook
   - ❑ Dry wash
   - ❑ Arroyo
   - ❑ Intermittent stream
   - ❑ Artificially created (ditch, etc.)
   - ❑ Other (specify)
   - ❑

2. Indicate the general composition of the bottom substrate.

   ☐ Bedrock ☐ Sand ☐ Concrete
   ☐ Boulder (>10 in.) ☐ Silt ☐ Debris
   ☐ Cobble (2.5 - 10 in.) ☐ Clay ☐ Detritus
   ☐ Gravel (0.1 - 2.5 in.) ☐ Muck (fine/black)
   ☐ Other (please specify):_____

3. Describe the condition of the bank (e.g., height, slope, extent of vegetative cover) of the aquatic feature.

   _____
   _____
   _____
   _____

4. Is there a discharge from the facility to the aquatic feature? ☐Yes ☐No
   If yes, describe the origin of each discharge and its migration path:

   _____
   _____
   _____
   _____

5. Indicate the discharge point of the water body. Specify name, if known.

   _____
   _____
   _____

Flowing Aquatic Feature Questions (Continued)

6. If the flowing aquatic feature is a dry wash or arroyo, answer the following questions.
   - ❑ Check here if feature is not a dry wash or arroyo

   If known, specify the average number of days in a year in which flowing water is present in the feature: _____

   Is standing water or mud present? Check all that apply.
   - ❑ Standing water
   - ❑ Mud
   - ❑ Neither standing water or mud

   Does the area show evidence of recent flow (e.g., flood debris clinging to vegetation)?
   - ❑ Yes
   - ❑ No
   - ❑ Not sure
7. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:

   _____
   _____
   _____
   _____

III.C Terrestrial Habitats

III.C.1 Wooded

Are any wooded areas on or adjacent to the site? ☐Yes X No

If yes, indicate the wooded area on the attached site map and answer the following questions. If more than one wooded area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wooded area. Distinguish between wooded areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.2.

Wooded Area Questions

☐On-site ☐Off-site

Name or Designation:_____

1. Estimate the approximate size of the wooded area (in acres or sq. ft.)

2. Indicate the dominant type of vegetation in the wooded area.

   - ❑ Evergreen
   - ❑ Deciduous
   - ❑ Mixed

Dominant plant species, if known:_____

3. Estimate the vegetation density of the wooded area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the predominant size of the trees at the site. Use diameter at chest height.

   - ❑ 0-6 inches
   - ❑ 6-12 inches
   - ❑ >12 inches
   - ❑ No single size range is predominant

5. Animals observed in the wooded area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:_____

III.C.2 Shrub/Scrub

Are any shrub/scrub areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the shrub/scrub area on the attached site map and answer the following questions. If more than one shrub/scrub area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual shrub/scrub area. Distinguish between shrub/scrub areas, using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.3.

Shrub/Scrub Area Questions

X Onsite X Offsite

Name or Designation: Chihuahuan Desert Scrub (HAFB, 2011).
Note also: On-site areas are almost entirely gravel covered and void of habitat or vegetation with some apparent pockets of desert vegetation. Surrounding site habitat is characterized as Chihuahuan Desert. The habitat map (Figure 1) shows that habitat surrounding the site(generally to the north) is dominated by fourwing saltbush/gypsum dropseed shrubland habitat, with lesser amounts of fourwing saltbush/alkali sacaton shrubland and alkali sacaton grassland. To the south, there are areas of pickleweed shrubland and gypsum dropseed grassland habitats, then large expanses of barren alkali playa.

1. Estimate the approximate size of the shrub/scrub area (in acres or sq. ft.). Surrounding HAFB are tens of thousands of acres of Chihuahuan Desert Scrub.

2. Indicate the dominant type of shrub/scrub vegetation present, if known.

According to information provided in Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011), the area around Building 1175 (OT-C543) is dominated by Fourwing Saltbush/Alkali Sacaton Shrubland to the north with large areas of barren alkali playa to the south.

3. Estimate the vegetation density of the shrub/scrub area.

- ❑ Dense (i.e., greater than 75% vegetation)
- X Moderate (i.e., 25% to 75% vegetation)
- ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the scrub/shrub vegetation.

- ❑ 0-2 feet
- X 2-5 feet
- ❑ >5 feet

5. Animals observed in the shrub/scrub area or suspected to be present based on indirect evidence or file material:
   - X Birds
   - X Mammals
   - X Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:
   The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna

associated with the shrubland habitat potentially present in the area of Building 1175. Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam kangaroo rat *(Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.3 Grassland

Are any grassland areas on or adjacent to the site? ☐Yes X No

If yes, indicate the grassland area on the attached site map and answer the following questions. If more than one grassland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual grassland area. Distinguish between grassland areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.4.

Grassland Area Questions

☐Onsite ☐Offsite

Name or Designation:_____

1. Estimate the approximate size of the grassland area (in acres or sq. ft.)._____

2. Indicate the dominant plant type, if known.
_____
_____
_____
_____

3. Estimate the vegetation density of the grassland area.

- ❑ Dense (i.e., greater than 75% vegetation)
- ❑ Moderate (i.e., 25% to 75% vegetation)
- ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the dominant plant type (in ft. or in.)_

5. Animals observed in the grassland area or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, lizards)
- ❑ Amphibians (e.g., toads, salamanders)

Specify species, if known:

III.C.4 Desert

Are any desert areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the desert area on the attached site map and answer the following questions. If more than one desert area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual desert area. Distinguish between desert areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.5.

Desert Area Questions

X Onsite X Offsite
Name or Designation: Chihuahuan Desert

1. Estimate the approximate size of the desert area (in acres or sq. ft.).
This site including HAFB is contained within tens of thousands of acres of the Chihuahuan Desert.

2. Describe the desert area (e.g., presence or absence of vegetation, vegetation types, presence/size of rocks, sand, etc.)
Many volumes of literature have been written on the natural biota of the Chihuahuan Desert. Detailed descriptions about the biotic communities within HAFB can be found in the HAFB Integrated Natural Resource Management Plan, (HAFB, 2011). Habitats directly associated with this Site include typical desert scrub communities.

3. Animals observed in the desert area or suspected to be present based on indirect evidence or file material:

X Birds
X Mammals
X Reptiles (e.g., snakes, lizards)
❑ Amphibians (e.g., toads, salamanders)

Specify species, if known:

The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna associated with the shrubland habitat potentially present in the area of Building 1175. Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam

kangaroo rat (*Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.5 Other

1. Are there any other terrestrial communities or habitats on or adjacent to the site which were not previously described?

☐Yes X No

If yes, indicate the "other" area(s) on the attached site map and describe the area(s) below. Distinguish between onsite and offsite areas. If no, proceed to Section III.D.

III.D Sensitive Environments and Receptors

1. Do any other potentially sensitive environmental areas[2] exist adjacent to or within 0.5 miles of the site? If yes, list these areas and provide the source(s) of information used to identify sensitive areas. *Do not answer "no" without confirmation from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

The following is taken from the Integrated Natural Resources Management Plan for HAFB (HAFB,2011). HAFB and its Geographically Separated Units (GSUs) have high biodiversity, including many sensitive species. No threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The White Sands pupfish is not Federally-listed nor has critical habitat been designated because of the multi-agency cooperative agreement to manage the species to support viable populations through habitat management and research. This site lies within a 0.5 mile radius of potential habitat for the White Sands Pupfish.

Most of the sensitive species are birds that are either associated with grassland habitats on main base or with wetland habitats, primarily in the Lake Holloman Public Access Area

2 Areas that provide unique and often protected habitat for wildlife species. These areas are typically used during critical life stages such as breeding, hatching, rearing of young and overwintering. Refer to **Table 1** at the end of this document for examples of sensitive environments.

wetlands complex south of the Cantonment. Sensitive grassland and desert species at HAFB that are discussed in further detail in the management plan include:

- White Sands pupfish
- Acarospora clauzadeana lichen
- Grassland neotropical migratory birds
- Western burrowing owl
- Aplomado falcon
- Grassland raptors
- Bats
- Texas horned lizard and other reptiles

2. Are any areas on or near (i.e., within 0.5 miles) the site which are owned or used by local tribes? If yes, describe. *Contact the Tribal Liason in the Office of the Secretary (505)827-2855 to obtain this information.*

No

3. Does the site serve or potentially serve as a habitat, foraging area, or refuge by rare, threatened, endangered, candidate and/or proposed species (plants or animals), or any otherwise protected species? If yes, identify species. *This information should be obtained from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

No, based on information in the Integrated Natural Resources Management Plan, no threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The plan establishes protocols for management of sensitive desert and grassland habitats.

4. Is the site potentially used as a breeding, roosting or feeding area by migratory bird species? If yes, identify which species.

Likely not. The site has very limited viable habitat due to the disturbed nature of the site, but areas surrounding the site could potentially provide habitat for these purposes.

5. Is the site used by any ecologically[3], recreationally, or commercially important

3 Ecologically important species include populations of species which provide a critical (i.e., not replaceable) food resource for higher organisms and whose function as such would not be replaced by more tolerant species; or perform a critical ecological function (such as organic matter decomposition) and whose functions will not be replaced by other species. Ecologically important species include pest and opportunistic species that populate an area if they serve as a food source for other species, but do not include domesticated animals (e.g., pets and livestock) or plants/animals whose existence is maintained by continuous human interventions (e.g., fish hatcheries, agricultural crops, etc.,)

species? If yes, explain.

No

IV. EXPOSURE PATHWAY EVALUATION

1. Do existing data provide sufficient information on the nature, rate, and extent of contamination at the site?

   X Yes
   ❑ No
   ❑ Uncertain

   Please provide an explanation for your answer: Sample results have sufficiently characterized the site.

2. Do existing data provide sufficient information on the nature, rate, and extent of contamination in offsite affected areas?

   □ Yes
   ❑ No
   ❑ Uncertain
   X No offsite contamination

   Please provide an explanation for your answer:
   No offsite contamination is expected, and no off-site soil or groundwater samples were collected.

3. Do existing data address potential migration pathways of contaminants at the site?

X Yes
❑ No
❑ Uncertain

Please provide an explanation for your answer

While potential migration from impacted soils to groundwater might occur, no ecological exposure to groundwater is expected.

4. Do existing data address potential migration pathways of contaminants in offsite affected areas?

□ Yes
❑ No
❑ Uncertain
X No offsite contamination

Please provide an explanation for your answer:

See response to No. 3 presented previously. Also, no off-site soil contamination is expected.

5. Are there visible indications of stressed habitats or receptors on or near (i.e., within 0.5 miles) the site that may be the result of a chemical release? If yes, explain. Attach photographs if available.

No.

6. Is the location of the contamination such that receptors might be reasonably expected to come into contact with it? For soil, this means contamination in the soil 0 to 5 feet below ground surface (bgs). If yes, explain.

Yes. Some soil samples were collected in site areas where receptors might contact detected constituents.

7. Are receptors located in or using habitats where chemicals exist in air, soil, sediment or surface water? If yes, explain.

Yes. See response to No. 6 presented above.

8. Could chemicals reach receptors via groundwater? Can chemicals leach or dissolve to groundwater? Are chemicals mobile in groundwater? Does groundwater discharge into receptor habitats? If yes, explain.

No Groundwater does not discharge into receptor habitats at or near the site.

9. Could chemicals reach receptors through runoff or erosion? Answer the following questions:

What is the approximate distance from the contaminated area to the nearest watercourse or arroyo?

- ❑ 0 feet (i.e., contamination has reached a watercourse or arroyo)
- ❑ 1-10 feet
- ❑ 11-20 feet
- ❑ 21-50 feet
- ❑ 51-100 feet
- ❑ 101-200 feet
- ❑ > 200 feet
- ❑ > 500 feet
- X > 1000 feet

What is the slope of the ground in the contaminated area?

- X 0-10%
- ❑ 10-30%
- ❑ > 30%

What is the approximate amount of ground and canopy vegetative cover in the contaminated area?

- ❑ < 25%
- X 25-75%
- ❑ > 75%

Is there visible evidence of erosion (e.g., a rill or gully) in or near the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

Do any structures, pavement, or natural drainage features direct run-on flow (i.e., surface flows originating upstream or uphill from the area of concern) into the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

10. Could chemicals reach receptors through the dispersion of contaminants in air (e.g., volatilization, vapors, fugitive dust)? If yes, explain.

Yes. However, detected concentrations of constituents in soil do not generally exceeding relevant background values or ecological screening criteria (see screening assessment in main text).

11. Could chemicals reach receptors through migration of non-aqueous phase liquids (NAPLs)? Is a NAPL present at the site that might be migrating towards receptors or habitats? Could NAPL discharge contact receptors or their habitat?

No NAPLs are present at the site.

12. Could receptors be impacted by external irradiation at the site? Are gamma emitting radionuclides present at the site? Is the radionuclide contamination buried or at the surface?

No. No radionuclide contamination is expected to be present at the site.

PHOTOGRAPHIC DOCUMENTATION

During the site visit(s), photographs should be taken to document the current conditions at the site and to support the information entered in the checklist. For example, photographs may be used to document the following:

- The nature, quality, and distribution of vegetation at the site
- Receptors or evidence of receptors
- Potentially important ecological features, such as ponds and drainage ditches
- Potential exposure pathways
- Any evidence of contamination or impact

SUMMARY OF OBSERVATIONS AND SITE SETTING

Include information on significant source areas and migration pathways that are likely to constitute complete exposure pathways.

Although potentially complete exposure pathways exist (e.g. direct contact with surface soil), significant source areas are not present, as results of the screening assessment (see main text) indicate that detected concentrations of constituents in soil do not generally exceeding relevant ecological screening criteria.

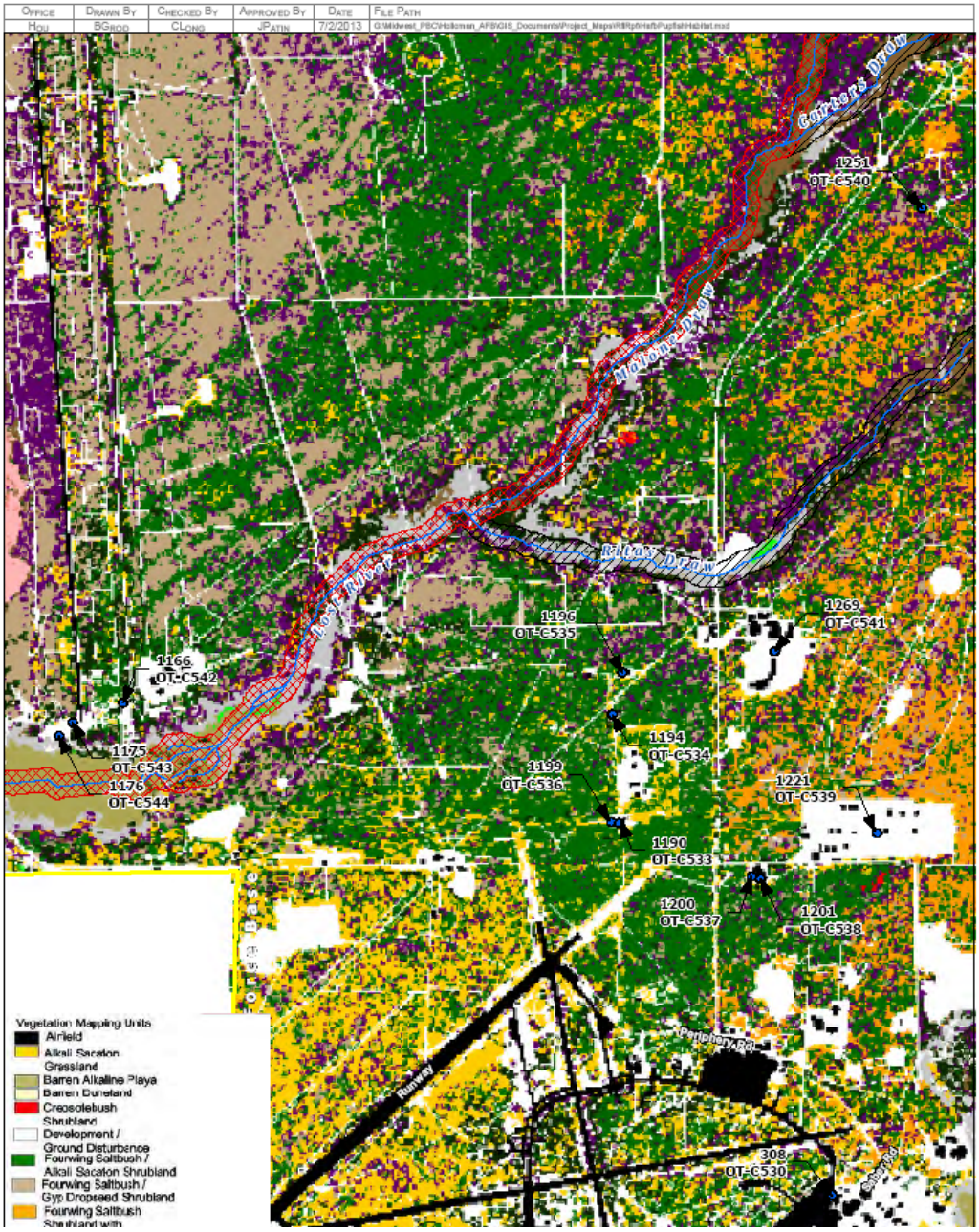
Checklist Completed by William Squire

Affiliation CB & I Federal Services, LLC.

Author Assisted by William Stanhope, CB & I Federal Services, LLC.

Date_July 18, 2013

Building 1175 Location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Checked By
CLONG
Approved By
JPATIN
Date
7/2/2013
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Rio Ruidoso
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1175
OT-C543
1176
OT-C544
1199
OT-C536
1221
OT-C539
1190
OT-C533
1200
OT-C537
1201
OT-C538
308
OT-C530
Peripheral Rd
Runway
Vegetation Mapping Units
Airfield
Alkali Sacaton Grassland
Barren Alkaline Playa
Barren Dunefield
Creosotebush Shrubland
Development / Ground Disturbance
Fourwing Saltbush / Alkali Sacaton Shrubland
Fourwing Saltbush / Gyp Dropseed Shrubland
Fourwing Saltbush Shrubland with

REFERENCES

Holloman Air Force Base (HAFB), 2011. *Integrated Natural Resource Management Plan*, February.

New Mexico Environment Department (NMED), 2012. *Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document*, Hazardous Waste Bureau and Ground Water Quality Bureau, February, Table A-1 updated June 2012.

Shaw Environmental & Infrastructure, Incorporated. (Shaw), 2012. *Final Voluntary Corrective Measure Request, Septic System Sites, Holloman Air Force Base, New Mexico*, January.

TABLE 1
EXAMPLES OF SENSITIVE ENVIRONMENTS

National Parks and National Monuments

Designated or Administratively Proposed Federal Wilderness Areas

National Preserves

National or State Wildlife Refuges

National Lakeshore Recreational Areas

Federal land designated for protection of natural ecosystems

State land designated for wildlife or game management

State designated Natural Areas

Federal or state designated Scenic or Wild River

All areas that provide or could potentially provide critical habitat[1] for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern

All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes

All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)

---

1 Critical habitats are defined by the Endangered Species Act (50 CFR §424.02(d)) as:

> 1) Specific areas within the geographical area currently occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (ii) that may require special management considerations or protection, and 2) Specific areas outside the geographical area occupied by a species at the time it is listed upon a determination by the Secretary [of Interior] that such areas are essential for the conservation of the species.

All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)

All areas that provide or could potentially provide habitat for song birds as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-13)

All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)

All areas that provide or could potentially provide habitat for horned toads and Bullfrogs as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, resp.)

All perennial waters (e.g., rivers, lakes, playas, sloughs, ponds, etc)

All ephemeral drainage (e.g., arroyos, puddles/pools, intermittent streams, etc) that provide significant wildlife habitat or that could potentially transport contaminants off site to areas that provide wildlife habitat

All riparian habitats

All perennial and ephemeral wetlands (not limited to jurisdictional wetlands)

All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle.

ATTACHMENT B

ECOLOGICAL SITE EXCLUSION CRITERIA CHECKLIST AND DECISION TREE

1. NEW MEXICO ECOLOGICAL EXCLUSION CRITERIA CHECKLIST

The following questions are designed to be used in conjunction with the Ecological Exclusion Criteria Decision Tree (Figure 1). After answering each question, refer to the Decision Tree to determine the appropriate next step. In some cases, questions will be omitted as the user is directed to another section as indicated by the flow diagram in the Decision Tree. For example, if the user answers "yes" to Question 1 of Section I, he or she is directed to proceed to Section II.

I. Habitat

In the following questions, "affected property" refers to all property on which a release has occurred or is believed to have occurred, including off-site areas where contamination may have occurred or migrated.

1. Are any of the below-listed sensitive environments at, adjacent to, or in the locality1 of the affected property?

   - National Park or National Monument
   - Designated or administratively proposed Federal Wilderness Area
   - National Preserve
   - National or State Wildlife Refuge
   - Federal or State land designated for wildlife or game management
   - State designated Natural Areas
   - All areas that are owned or used by local tribes
   - All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle
   - All areas that provide or could potentially provide habitat for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern
   - All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes
   - All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)
   - All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)
   - All areas that provide or could potentially provide habitat for song birds as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game

1 *Locality* of the site refers to any area where an ecological receptor is likely to contact site-related chemicals. The locality of the site considers the likelihood of contamination migrating over time and places the site in the context of its general surrounding. Therefore, the locality is typically larger than the site and the areas adjacent to the site.

and Fish, 17-2-13)

- All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)
- All areas that provide or could potentially provide habitat for horned toads and bullfrogs as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, respectively)

2. Does the affected property contain land areas which were not listed in Question 1, but could be considered viable ecological habitat? The following are examples (but not a complete listing) of viable ecological habitats:

- Wooded areas
- Shrub/scrub vegetated areas
- Open fields (prairie)
- Other grassy areas
- Desert areas
- Any other areas which support wildlife and/or vegetation, excluding areas which support only opportunistic species (such as house mice, Norway rats, pigeons, etc.) that do not serve as prey to species in adjacent habitats.

The following features are <u>not</u> considered ecologically viable:

- Pavement
- Buildings
- Paved areas of roadways
- Paved/concrete equipment storage pads
- Paved manufacturing or process areas
- Other non-natural surface cover or structure

3. Does the affected property contain any perennial or ephemeral aquatic features which were not listed in Question 1?

II. Receptors

1. Is any part of the affected property used for habitat, foraging area, or refuge by any rare, threatened, or endangered species (plant *or* animal), or otherwise protected species (e.g., raptors, migratory birds)?

2. Is any part of the affected property used for habitat, foraging area, or refuge by any species used as a recreational (e.g., game animals) and/or commercial resource?

3. Is any part of the affected property used for habitat, foraging area, or refuge by any plant or animal species? This includes plants considered "weeds" and opportunistic insect and animal species (such as cockroaches and rats) if they are used as a food source for other species in the area.

III. Exposure Pathways

1. Could receptors be impacted by contaminants via direct contact?

   Is a receptor located in or using an area where it could contact contaminated air, soil3, or surface water?

For Questions 2 and 3, note that one must answer "yes" to all three bullets in order to be directed to the "exclusion denied" box of the decision tree. This is because answering "no" to one of the questions in the bullet list indicates that a complete exposure pathway is not present. For example, in Question 2, if the chemical cannot leach or dissolve to groundwater (bullet 1), there is no chance of ecological receptors being exposed to the chemical through contact with contaminated groundwater. Similarly, the responses to the questions in Question 4 determine whether a complete pathway exists for exposure to NAPL.

2. Could receptors contact contaminants via groundwater?
   - Can the chemical leach or dissolve to groundwater4?
   - Can groundwater mobilize the chemical?
   - Could (does) contaminated groundwater discharge into known or potential receptor habitats?

3. Could receptors contact contaminants via runoff (i.e., surface water and/or suspended sediment) or erosion by water or wind?
   - Are chemicals present in surface soils?
   - Can the chemical be leached from or eroded with surface soils?
   - Is there a receptor habitat located downgradient of the leached/eroded surface soil?

---

3 For soil, this means contamination less than 5 feet below ground surface (bgs).

4 Information on the environmental fate of specific chemicals can be found on the Internet at *http://www.epa.gov/opptintr/chemfact/* or at a local library in published copies of the *Hazardous Substances Data Bank*.

4. Could receptors contact contaminants via migration of non-aqueous phase liquids (NAPL)?

- Is NAPL present at the site?
- Is NAPL migrating toward potential receptors or habitats?
- Could NAPL discharge impact receptors or habitats?

Figure 1 -Ecological Exclusion Criteria Decision Tree

(Refer to corresponding checklist for the full text of each question)

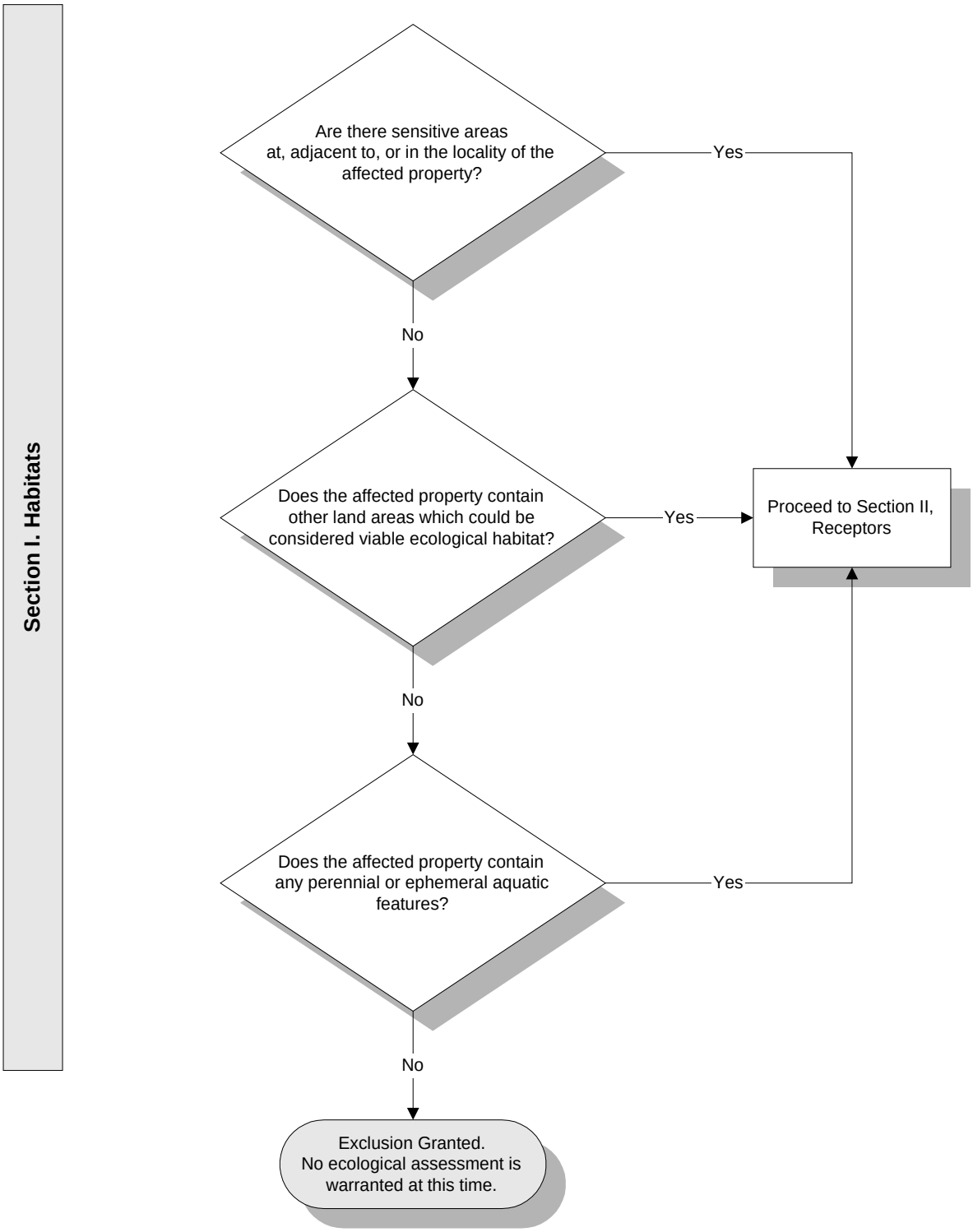

Figure 1 - Exclusion Criteria Decision Tree (continued)

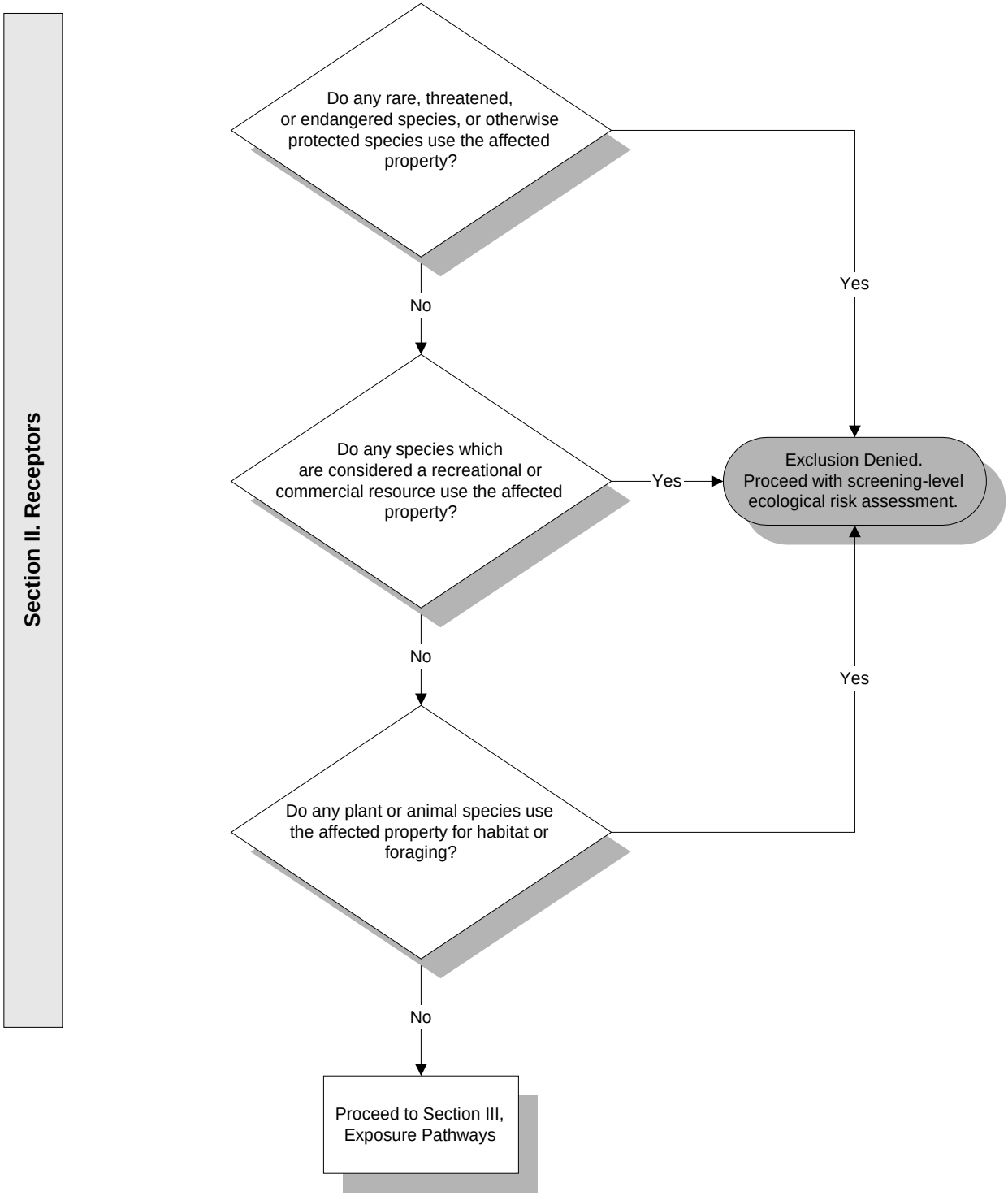

Figure 1 - Exclusion Criteria Decision Tree (continued)

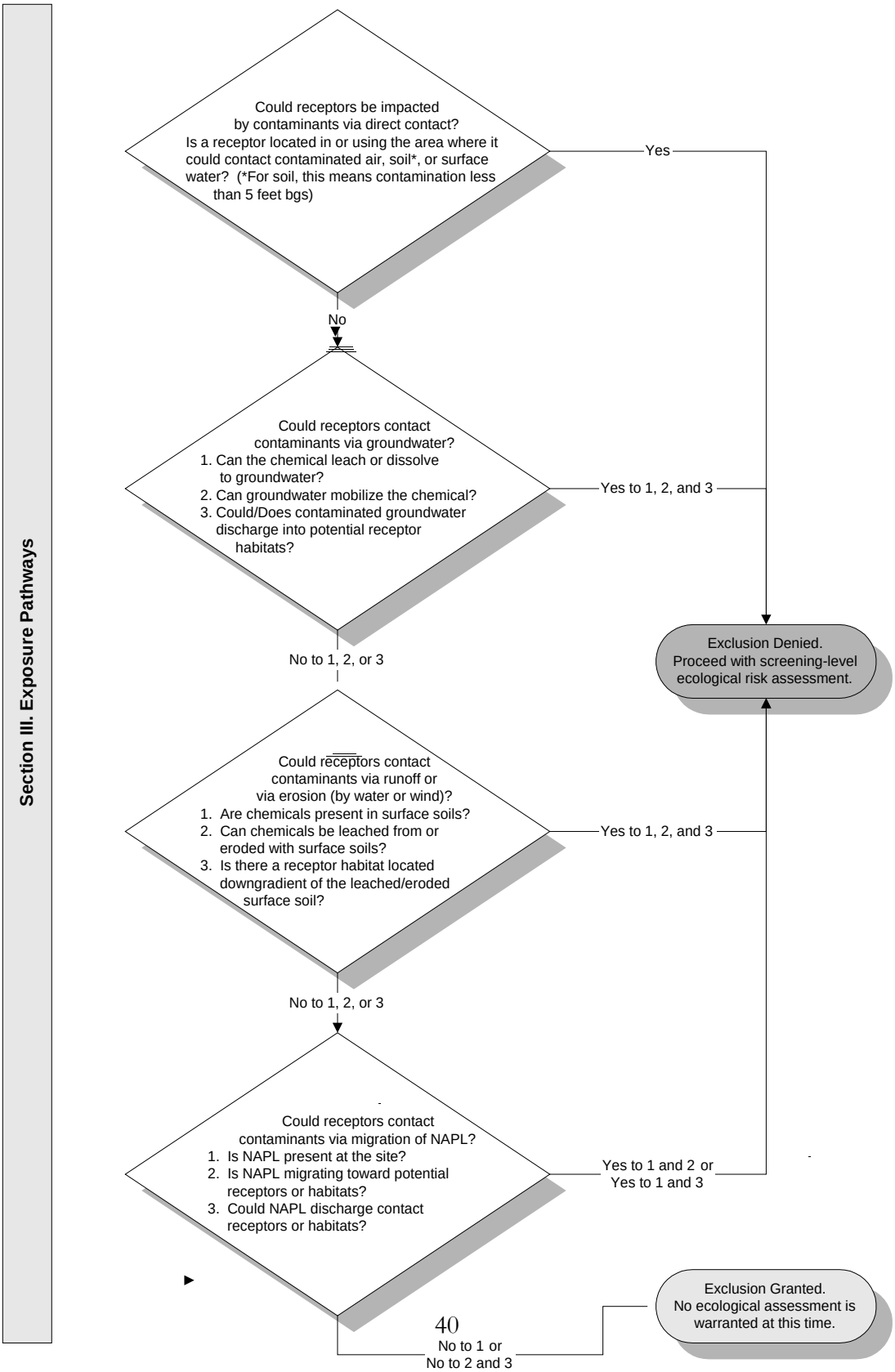

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

Analyte		Sample Number	OTC543-IS-0001-070512		OTC543-IS-0003-070512		OTC543-IS-0005-070512		OTC543-IS-0007-070512		OTC543-IS-0010-070512	
		Sample Date	7/5/2012		7/5/2012		7/5/2012		7/5/2012		7/5/2012	
		Location	Station 1, tank influent		Station 2, septic tank		Station 3, tank effluent		Station 4, leach field		Station 4, leach field	
		Depth (ft bgs)	3 - 5		7 - 9		3 - 5		3 - 5		0 - 2	
	Background Values - Soil (mg/kg)[a]	LANL (2012) ESLs (mg/kg)	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	**68.4**		**71.9**		**75.2**		**81.7**		**73.1**	
VOLATILES (mg/kg)												
ETHYLBENZENE	NE	NSV	**0.005**	J	0.0013	U	0.0013	U	0.0012	U	0.0015	U
TOLUENE	NE	23 / 230	**0.0041**	J	0.0016	U	0.0016	U	0.0015	U	0.0019	U
XYLENES, TOTAL	NE	1.4 / 1.7	**0.0252**		0.0042	UJ	0.0042	U	0.004	U	0.0049	U
SEMIVOLATILES (mg/kg)												
CAPROLACTAM	NE	NSV	0.31	U	0.074	UJ	0.07	U	0.064	U	**0.0875**	J
PYRENE	NE	10 / 20	0.097	U	0.023	U	0.022	U	0.02	U	**0.033**	J
METALS (mg/kg)												
ALUMINUM	13722	pH Dependent	**5770**		**1180**		**5840**		**3670**		**3240**	
ARSENIC	3.7	6.8 / 68	**1.8**	J	1.1	U	1.3	U	0.9	U	1.2	U
BARIUM	169.3	110 / 260	**77.4**	J	**18.3**	J	**58.2**	J	**43.4**	J	**41.2**	J
CALCIUM	317332	NSV	**272000**		**251000**		**226000**		**228000**		**277000**	
CHROMIUM	25	28 / 280	**6.4**		**0.95**	J	**5.4**	J	**3.2**	J	**3.1**	J
COBALT	7.7	13 / 130	**2**	J	**0.56**	J	**1.8**	J	**1.2**	J	**1.1**	J
COPPER	13	15 / 46	**4.4**	J	1.1	U	**3.9**	J	**2.6**	J	**2.9**	J
IRON	23049	NSV	**5200**		**1190**		**5270**		**3300**		**3080**	
LEAD	10.9	14 / 28	**2.8**	J	**0.61**	J	**2.8**	J	**1.4**	J	**2**	J
MAGNESIUM	16991	NSV	**10900**		**674**	J	**11100**		**7200**		**5280**	
MANGANESE	393	220 / 1,100	**104**		**15.4**		**115**		**75.9**		**79.3**	
NICKEL	17.4	9.7 / 19	**4.7**	J	**1**	J	**4.2**	J	**2.7**	J	**2.6**	J
POTASSIUM	5077	NSV	**1430**	J	**316**	J	**1430**	J	**1080**	J	**1000**	J
SODIUM	5196	NSV	660	U	610	U	690	U	**1370**	J	**1470**	J
VANADIUM	42.6	0.025 / 0.25	13.3	J	2.9	J	12.1	J	7	J	6.5	J
ZINC	54.6	48 / 480	**13.9**		**3.2**	J	**13.6**		**8.1**	J	**8.7**	J
PETROLEUM HYDROCARBONS (mg/kg)												
DIESEL RANGE ORGANICS C10-C28	NE	NE	**12.3**		4.6	U	4.4	U	4.1	U	**23.7**	
OIL RANGE ORGANICS C28-C40	NE	NE	**45.9**		4.6	U	**4.81**	J	4.1	U	**23.7**	

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1175 (OT-C543) RFI Report
Holloman Air Force Base, New Mexico

LANL (2012) ESL values represented as: No Effect ESL / Low-Effect ESL (e.g., 1.4 / 1.7 for total xylenes)

LANL (2012) ESL Exceeded

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *Los Alamos National Laboratory (LANL), 2012, ECORISK Database, LA-UR-12-24548, Release 3.1, October.*

[c] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
ESL = ecological screening level
HAFB = Holloman Air Force Base
IS = investigative soil (sample)
J = estimated value
LANL = Los Alamos National Laboratory
mg/kg = milligrams per kilogram
NE = not established
NMED = New Mexico Environment Department
NSV = no screening value (available)
RCRA = Resource Recovery and Conservation Act
RFI = RCRA Facility Investigation
U = not detected at the detection limit shown
VQ = validation qualifier

Final

RCRA Facility Investigation Report
Group 1 – Building 1176 (OT-C544)
Holloman Air Force Base, New Mexico

Prepared for U.S. Air Force Civil Engineer Center
2261 Hughes Ave., Suite 155
Lackland Air Force Base, Texas 78236-9861

Prepared by Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)
1401 Enclave Parkway, Suite 250
Houston, Texas 77077

Contract No. FA8903-09-D-8580
Task Order No. 0013
Project No. 144106
Revision 0
October 2013

Shaw Environmental & Infrastructure, Inc.
(A CB&I Company)

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Acronyms and Abbreviations

AFB	Air Force Base
bgs	below ground surface
COPC	constituent of potential concern
DPT	direct push technology
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
ESL	ecological screening level
ft	foot/feet
GPR	ground-penetrating radar
GRO	gasoline range organics
HI	hazard index
IDW	investigation-derived waste
LANL	Los Alamos National Laboratory
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MCL	maximum contaminant level
MDL	method detection limit
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMWQCC	New Mexico Water Quality Control Commission
ORO	oil range organics
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RSL	Regional Screening Level
Shaw	Shaw Environmental & Infrastructure, Inc. (a CB&I Company)
SLERA	screening-level ecological risk assessment
SSL	soil screening level
SVOC	semivolatile organic compound
TAL	target analyte list
TDS	total dissolved solids
TPH	total petroleum hydrocarbons
UCL	upper confidence limit
USACE	United States Army Corp of Engineers
VOC	volatile organic compound
WQS	water quality standard

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1.0 INTRODUCTION

Shaw Environmental & Infrastructure, Inc. (Shaw), a CB&I company, prepared this Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Report for the Air Force Civil Engineer Center (formerly the Air Force Center for Engineering and the Environment) under Contract No. FA8903-09-D-8580, Task Order No. 0013, Modification 01. Results presented in this report are from the investigation and corrective measures of the removed septic tank formerly located at Building 1176 (OT-C544) at Holloman Air Force Base (AFB), New Mexico, which was one of the fifteen Group 1 septic tank sites under the Midwestern Region Performance-Based Remediation Contract. This RFI Report has been prepared pursuant to the requirements of the Holloman AFB Hazardous Waste Facility RCRA Permit No. NM6572124422 (the Permit) (New Mexico Environment Department [NMED], 2004). The purpose of this RFI was to delineate potential contamination that may have been released to the environment from the Building 1176 septic tank system.

Holloman AFB is situated in south-central New Mexico in the northwest central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). The 15 Group 1 former septic tank sites are located throughout Holloman AFB (Figure 1-2). Each former septic tank is positioned adjacent to a building. As such, each septic tank is named in reference to its most proximal building, as follows: OT-C530 (Building 308), OT-C531 (Buildings 920, 921, and 922), OT-C532 (Building 924), OT-C533 (Building 1190), OT-C534 (Building 1194), OT-C535 (Building 1196), OT-C536 (Building 1199), OT-C537 (Building 1200), OT-C538 (Building 1201), OT-C539 (Building 1221), OT-C540 (Building 1251), OT-C541 (Building 1269), OT-C542 (Building 1166), OT-C543 (Building 1175), and OT-C544 (Building 1176). This report presents a summary of the RFI work conducted at removed septic tank OT-C544 at Building 1176.

Building 1176 was constructed in 1959. The 3,850-square foot (ft) building is located at the south end of the Test Track, and is known as the Sled Launch Shop. Building 1176 contained a lavatory and shower during the time it was connected to the septic system. The *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) report in Appendix A indicated that the 640-gallon septic tank was removed prior to 2006; however, abandonment records are unavailable.

1.1 Purpose of the Investigation

Investigative activities were undertaken at Holloman AFB to determine the nature and extent of contamination, and propose recommendations for either closure or additional corrective action, if necessary, at 15 inactive, abandoned, or removed septic tank systems, following the

general guidance for closing septic systems found in 20.7.3.307 New Mexico Administrative Code (NMAC) Standards – Abandoned Sewers and On-Site Liquid Waste Systems.

Project quality objectives for each septic tank site consisted of the following:

- Gather and review all site historical information
- Identify septic tank components and historical uses
- Remove septic tank contents and contaminated soil (where necessary), and abandon the tank (where necessary)
- Determine the nature and extent of residual constituents of concern at each site, including potential pathways to groundwater
- Evaluate the risk at each site
- Develop conclusions and recommendations for each site.

This RFI Report presents the data collected to meet these project quality objectives at the Building 1176 abandoned septic tank.

1.2 Scope of Activities

This RFI Report describes all activities associated with the removed septic tank investigation and remediation at Building 1176, including soil and groundwater sampling, sample analysis, as-built pipe mapping, and site boundary survey. All work was performed in accordance with the *Basewide Septic Tank Solid Waste Management Units RFI Work Plan* (U.S. Army Corps of Engineers [USACE], 2010) and the *Quality Program Plan* (Shaw, 2012a). The *Quality Program Plan* (Shaw, 2012a) contains the Site Safety and Health Plan; the Uniform Federal Policy – Sampling and Analysis Plan/Quality Assurance Project Plan; and the Construction Quality Plan, which defines the methodology and practices that were used to control construction work during the performance of the RFI.

1.3 Regulatory Setting

The Permit established the general and specific standards and activities for managing hazardous waste pursuant to Subtitle C of RCRA, the New Mexico Hazardous Waste Act, and the New Mexico Hazardous Waste Management Regulations. The Permit also set forth requirements for investigation, notification, corrective action, and reporting for the storage, management, and releases of hazardous wastes.

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The 15 septic systems were either abandoned, inactive, or previously removed, as indicated in *Holloman Air Force Base Septic Tanks* (U.S. Air Force, 2007) report (Appendix A), and were not listed in the Permit (NMED, 2004). The Holloman AFB *RFI Work Plan* (USACE, 2010) was approved by NMED in a letter dated January 13, 2010 (NMED, 2010). The NMED-approved *RFI Work Plan* (USACE, 2010) contained investigation activities only; therefore Shaw submitted the Group 1 *Final Voluntary Corrective Measures Request – Septic Tank Sites* (Shaw, 2012b) to include remediation and closure tasks that address septic system abandonment using 20.7.3.307 NMAC (Abandoned Sewers and On-Site Liquid Waste Systems). NMED has primary regulatory responsibility for the septic system sites; therefore corrective action must be performed under Title 20 NMAC.

The septic tank investigations were based on action/cleanup levels stipulated in Appendix 4-F of the Permit to be protective of human health and the environment. Permit Appendix 4-F specifies that soil contaminant concentrations be compared with the NMED residential soil screening levels (SSL), as presented in the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a), or the *U.S. Environmental Protection Agency (EPA) Regions 3, 6, and 9 Regional Screening Levels for Chemical Contaminants at Superfund Sites* (EPA, 2012a), if no NMED SSL has been established. Holloman AFB also has NMED-approved background concentrations for metals in soil (NMED, 2012b).

For groundwater, the Permit specifies that the more stringent of either the New Mexico Water Quality Control Commission (NMWQCC) water quality standards (WQS) (20.6.2 NMAC) or the EPA maximum contaminant levels (MCLs) for drinking water be used for comparison with measured sample concentrations (EPA, 2012b).

1.4 RFI Report Organization

This RFI Report is organized into the following sections:

- **Section 1.0, Introduction**: Identifies the objectives and purpose of this report.
- **Section 2.0, Environmental Setting**: Provides pertinent descriptions of history, location, physiography, topography, surface water, hydrology, regional geology, soil types, regional hydrogeology, climate, current and future land use, and current and future water use for Holloman AFB.
- **Section 3.0, Source Characterization**: Presents the data collection techniques and locations, as well as analytical methods.
- **Section 4.0, Investigation Results and Evaluation**: Details the soil analytical results, and evaluates the human health risk due to site contaminants.

- **Section 5.0, Data Quality Assurance and Data Quality Control Review**: Summarizes the analytical data validation results.

- **Section 6.0, Conclusions and Recommendations**: Presents the conclusions and recommendations of this RFI report.

- **Section 7.0, References**: Lists the references cited in this report.

In addition to the figures and tables listed in the table of contents, the following appendices are included in this report:

- **Appendix A** – Historical Records
- **Appendix B** – Geophysical Report
- **Appendix C** – Sample Collection Logs
- **Appendix D** – Boring Logs
- **Appendix E** – Well Construction Diagrams
- **Appendix F** – Well Purge Records
- **Appendix G** – Site Survey Data
- **Appendix H** – Laboratory Analytical Data and Data Validation Checklists
- **Appendix I** – Waste Manifests
- **Appendix J** – Risk Evaluation Calculations
- **Appendix K** – Ecological Evaluation.

2.0 ENVIRONMENTAL SETTING

This section provides background information for Holloman AFB including physical setting, history, topography, climate, soils, geology, hydrology, and land and water use.

2.1 Physical Setting

Holloman AFB is situated in south-central New Mexico, in the northwest-central part of Otero County, approximately 75 miles north-northeast of El Paso, Texas (Figure 1-1). Holloman AFB has a population of 6,000, and occupies 59,639 acres in the northeast quarter of Section 1, Township 17 South, Range 8 East. The White Sands Missile Range testing facilities occupy additional land extending northward from the base. Privately- and publicly-owned lands border the remainder of Holloman AFB. The major highway servicing Holloman AFB is Highway 70, which runs southwest from the town of Alamogordo, New Mexico, and separates Holloman AFB from publicly owned lands to the south. Alamogordo, New Mexico, which has a population of 30,401 according to the 2010 U.S. Census, is located approximately 7 miles east of the base.

2.2 Holloman Air Force Base History

Holloman AFB was first established in 1942 as Alamogordo Army Air Field. From 1942 through 1945, Alamogordo Army Air Field served as the training grounds for over 20 different flight groups, flying primarily B-17s, B-24s, and B-29s. After World War II, most operations had ceased at the base. In 1947, Air Material Command announced the air field would be its primary site for the testing and development of unmanned aircraft, guided missiles, and other research programs. On January 13, 1948, the Alamogordo installation was renamed in honor of the late Colonel George V. Holloman, a pioneer in guided missile research. In 1968, the 49th Tactical Fighter Wing arrived at Holloman AFB, and has remained since. Today, Holloman AFB also serves as the training center for the German Air Force's Tactical Training Center.

2.3 Physiography and Topography

Holloman AFB is located within the Sacramento Mountains physiographic province on the western edge of the Sacramento Mountains. The base is approximately 59,600 acres in area, and is located at a mean elevation of 4,093 ft above mean sea level. The region is characterized by high tablelands with rolling summit plains; cuesta-formed mountains dipping eastward; and west-facing escarpments, with the wide bracketed basin forming the basin and range complex. Holloman AFB is located in the Tularosa Basin, which is part of the Central Closed Basins. The bordering mountains rise abruptly to altitudes of 7,000 to 12,000 ft above mean sea level. The San Andres Mountains bound the basin to the west

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(approximately 30 miles) with the Sacramento Mountains approximately 10 miles to the east (Figure 2-1). At its widest, the basin is approximately 60 miles east to west, and stretches approximately 150 miles north to south.

2.4 Climate

As a whole, New Mexico has a mild, arid to semiarid continental climate characterized by light precipitation totals, abundant sunshine, relatively low humidity, and relatively large annual and diurnal temperature ranges (Western Regional Climate Center, 2013). The climate of the Central Closed Basins varies with elevation. The base is located in the low areas and is characterized by warm temperatures and dry air. Daytime temperatures often exceed 100 degrees Fahrenheit in the summer months, and are in the middle 50s (degrees Fahrenheit) in the winter. A preponderance of clear skies and relatively low humidity permits rapid nighttime cooling resulting in average diurnal temperature ranges of 25 to 35 degrees Fahrenheit. Potential evapotranspiration, at 67 inches per year, significantly exceeds annual precipitation, usually less than 15 inches. Arid conditions resulting from very low rainfall amounts, coupled with the topographically induced wind patterns combining with the sparse vegetation, tend to cause localized “dust devils.” The annual rainfall for Alamogordo, New Mexico is 12 inches per year. Much of the precipitation falls during the midsummer monsoonal period (July and August) as brief, yet frequent, intense thunderstorms culminating in 30 to 40 percent of the total annual rainfall.

2.5 Regional Geology and Soils

2.5.1 Geology

The sedimentary rocks that make up the adjacent mountain ranges are between 250 and 500 million years old (New Mexico Bureau of Geology and Mineral Resources, 2012). During the period when the area was submerged beneath the shallow intracontinental sea, the layers of limestone, shale, gypsum, and sandstone were formed. In time, these layers were pushed upward through various tectonic forces forming a large bulge on the surface. Approximately 10 million years ago, the center began to subside resulting in a vertical drop of thousands of ft, leaving the edges still standing (the present-day Sacramento and San Andres mountain ranges). In the millions of years following, rainfall, snowmelt, and wind eroded the mountain sediments depositing them in the valley (i.e., Tularosa Basin). Water carrying eroded limestone, dolomite, gravel, and other materials continue to flow into the basin.

As the Tularosa Basin is a bolson, which is a basin with no surface drainage outlet, sediments carried by surface water into a closed basin are bolson deposits. The overlying alluvium generally consists of unconsolidated gravels, sands, and clays. Soils in the basin are derived from the adjacent ranges as erosional deposits of limestone, dolomite, and gypsum. A fining

sequence from the ranges towards the basin's center characterizes the area with the near-surface soils as alluvial, eolian, and lacustrine deposits. The alluvial fan deposits are laterally discontinuous units of interbedded sand, silt, and clay while the eolian deposits consist primarily of gypsum sands. The eolian and alluvial deposits are usually indistinguishable due to the reworking of the alluvial sediment by eolian processes. The playa, or lacustrine deposits, consist of clay containing gypsum and are contiguous with the alluvial fan and eolian deposits throughout the base. Stiff caliche layers, varying in thickness, have been identified at different areas of the base.

2.5.2 Soils

The U.S. Natural Resources Conservation Service (formerly the Soil Conservation Service) has identified two soil associations in the vicinity of Holloman AFB: (1) the Holloman-Gypsum Land-Yesum Complex and (2) the Mead silty clay loam (Figure 2-2) (U.S. Department of Agriculture, 1981). The permeability of these horizons ranges from 4×10^{-4} to 1×10^{-3} centimeters per second.

The Holloman-Gypsum Land-Yesum Complex, 0 to 5 percent sloped soil, consists of larger areas of shallow and deep, well-drained soils and areas of exposed gypsum. The Holloman soil makes up approximately 35 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 13 inches of the substratum is pink, very fine sandy loam that is very high in gypsum. Below that, the substratum is white gypsum to a depth of more than 60 inches. This soil is calcareous and mildly alkaline to moderately alkaline. Permeability is moderate. Available water capacity is very low.

Gypsum Land makes up approximately 30 percent of the Holloman-Gypsum Land-Yesum Complex (0 to 5 percent slopes). Typically, less than 1 inch of very fine sandy loam overlies soft to hard, white gypsum. The deep Yesum consists of very fine sandy loam that makes up approximately 20 percent of the complex. Typically, the surface layer is light brown, very fine sandy loam approximately 3 inches thick. The upper 9 inches of the substratum is light brown, fine sandy loam that is very high in gypsum. Below that, the substratum is pink, very fine sandy loam to a depth of more than 60 inches. The soil is calcareous throughout, and is mildly alkaline. Permeability is moderate. Available water capacity is moderate. Many fine gypsum crystals are found throughout the profile.

The soil type found across the main drainage area for the installation is Mead silty clay loam, 0 to 1 percent slopes. This deep, poorly drained, nearly level soil is on outer fringes of alluvial fans. This soil formed in fine textured alluvium over lacustrine lake sediment. It is very high in salt content because of periodic flooding and poor drainage. Slopes are smooth and concave. Typically, the surface layer is reddish brown, silty clay loam, and clay loam

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approximately 5 inches thick. The substratum, to a depth of 48 inches, is light reddish brown clay that has a high content of salt. Below that, the substratum is lacustrine material of variable texture and color to a depth of more than 60 inches. Included within this soil are areas of Holloman soils and Gypsum Land along the margins of the unit of steep, short gully sides and knolls. These inclusions make up approximately 15 percent of the map unit for this soil type. Individual areas are generally smaller than 10 acres. This soil is moderately calcareous throughout and is moderately to strongly alkaline. It has a layer of salt that is more soluble than gypsum. Permeability is very low. Available water capacity is low (USACE, 2010).

2.6 Regional Hydrogeology

Groundwater occurs as an unconfined aquifer in the unconsolidated deposits of the central basin, with the primary source of recharge as rainfall percolation and minor amounts of stream runoff along the western edge of the Sacramento Mountains. Surface water/rainfall migrates downward into the alluvial sediments at the edge of the shallow aquifer near the ranges and flows through progressively finer-grained sediments towards the central basin. Because the Tularosa Basin is a closed system, water that enters the area leaves either through evaporation or percolation. This elevated amount of percolation results in a fairly high water table. Beneath Holloman AFB, groundwater ranges from 5 to 50 ft below ground surface (bgs). Flow for the base is generally towards the southwest with localized influences from the variations in the topography of the base (Figure 2-3). In the northern and western portions of the base, groundwater flows more to the west towards the Ritas Draw, Malone Draw, and Lost River drainages. Groundwater flow is affected by local topography in areas immediately adjacent to arroyos, where groundwater flows directly toward the drainages regardless of the regional flow pattern.

Groundwater in the Tularosa Basin is of potable quality at the recharge areas in close proximity to the Sacramento Mountains and becomes increasingly mineralized toward the central portion of the basin and discharge areas. The majority (over 70 percent) of the Environmental Restoration Program sites located across Holloman AFB have groundwater monitoring wells containing water with an average total dissolved solids (TDS) concentration greater than 10,000 milligrams per liter (mg/L). These TDS data support the hypothesis that TDS concentrations below 10,000 mg/L at Holloman AFB are caused by dilution of natural groundwater quality from leaking water lines and surface irrigation from the domestic water supply. TDS concentrations greater than 10,000 mg/L exceed the NMWQCC limit as potable water (20.6.2 NMAC), and thus, the groundwater beneath Holloman AFB has been designated as unfit for human consumption. Likewise, the EPA guidelines have identified the groundwater as a Class IIIB water source, characterized by TDS concentrations exceeding 10,000 mg/L, and is characterized by a low degree of

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interconnection with adjacent surface water or groundwater of a higher class. Groundwater does not discharge or connect to any adjacent aquifers, because the Tularosa Basin is a closed basin. Adjacent surface waters include Lost River and Lake Holloman, which also have high concentrations of TDS, and are not considered potential drinking water sources.

2.7 Surface Water and Hydrology

The Tularosa Basin contains all of the surface flow in its boundaries. The nearest inflow of surface waters to Holloman AFB comes from the Lost River, located in the north-central region of the base. The upper reaches of the Three Rivers and the Sacramento River are perennial in the basin. Holloman AFB is dissected by several southwest-trending arroyos that control the surface drainage. Hay Draw arroyo is located in the far north. Malone and Ritas Draws, which drain into the Lost River and Dillard Draw arroyos, are located along the eastern perimeter of the base. Approximately 10,000 years ago, indications are that a much wetter climate existed. The present-day Lake Otero encompassed a much larger area, possibly upwards of several hundred square miles. Its remains are the Alkali Flat and Lake Lucero. Lake Lucero is a temporary feature of merely a few inches in depth during the rainy season.

Ancient lakes and streams deposited water-bearing deposits over the older bedrock basement materials. Fractures, cracks, and fissures in the Permian and Pennsylvanian bedrock yield small quantities of relatively good-quality water in the deeper peripheral. Potable water is only found from wells near the edges of the basin, with more saline water towards the center. Two of the principal sources of potable water are: (1) a long narrow area on the upslope sides of Tularosa and Alamogordo, and (2) in the far southwestern part of the basin. A portion of the city of Alamogordo's water, as well as Holloman AFB's water, is supplied from Bonito Lake (which is in the Pecos River Basin).

2.8 Current and Future Land Use

The land surrounding Holloman AFB consists of residential areas to the east and northeast (city of Alamogordo, New Mexico), rangeland to the south, the White Sands National Monument to the west, and areas where military activities are conducted to the north. The desert terrain of the area immediately surrounding Holloman AFB has limited development, and there are no agricultural operations, residential communities, or large industrial operations located adjacent to the base. The Boles Well Field, a freshwater source for Holloman AFB, is located approximately 6 miles to the southeast of the base. Holloman AFB is an active military installation and is expected to remain active for the foreseeable future. No transfer of military property to the public is anticipated, and public access to the base is restricted. Future land use is not expected to differ significantly from current land use practices (Foster Wheeler Environmental Corporation, 2002).

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2.9 Current and Future Water Use

At present, Holloman AFB receives approximately 50 percent of its freshwater supply from the Boles Well Field. An additional freshwater resource for Holloman AFB, and for the city of Alamogordo, is Bonito Lake, located 60 miles northeast of the Tularosa Basin. Currently, there are no potable supplies of groundwater or surface water located on the base because of poor groundwater quality with TDS concentrations greater than 10,000 mg/L.

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3.0 SOURCE CHARACTERIZATION

This section presents the overall technical approach in general accordance with the *RFI Work Plan* (USACE, 2010) (except where otherwise noted), and details the investigative and remediation activities that were implemented at Building 1176.

The primary environmental media of concern at Building 1176 are soil and groundwater. The extent of contamination in soil was expected to be relatively local to the former septic tank location. Therefore, the basic approach was to identify the former septic tank location and then sample at the individual features of the septic tank system in characterizing the soil. To evaluate the potential impacts to groundwater, a monitoring well was installed in the downgradient end of the leach field. The analytical programs for both soil and groundwater focused on the expected nature of contamination likely to be associated with septic tank discharges.

The RFI conducted at removed septic tank OT-C544 (Building 1176) was initiated as part of the Midwestern Region Performance-Based Remediation Contract. The *RFI Work Plan* (USACE, 2010) for this site included the following field work activities: pre-mobilization and mobilization/site setup activities, soil boring advancement, soil sample collection, monitoring well installation and development, groundwater sample collection, sample analysis, investigation-derived waste (IDW) management, and land surveying.

3.1 Pre-mobilization/Mobilization Activities

Several pre-investigation documents were filed and approvals obtained, as follows:

- Civil Engineer Work Request (Air Force Form 332) approval
- Base digging permits (Air Force Form 103, Base Civil Engineering Work Clearance Request) with utility clearances
- Site security clearances
- Facility manager notification of the intended operations.

Prior to the start of activities, a pre-investigation kick-off meeting and site walk-through were conducted with the Air Force Civil Engineer Center resident engineer, Holloman AFB personnel, and Shaw's Construction Manager, to plan for equipment access, equipment staging, decontamination area layout, potential site hazards, emergency evacuation routes, and project schedule.

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Prior to the submittal of the base digging permits, the drilling locations were delineated using marker flags, stakes, and paint. Utility clearance approvals were completed by the appropriate Holloman AFB utility office (i.e., telephone, sewer, water, natural gas, etc.), and by the New Mexico One Call utility clearance system. Upon receipt of the approved digging permit and utility clearances, Shaw's Construction Manager completed a site walk-through to confirm the utility and intrusive work locations. In addition, Shaw performed a site survey prior to the start of drilling activities to search for signs of other buried or overhead utilities.

3.2 Geophysical Investigation

A geophysical investigation was performed at Building 1176 in an attempt to define the limits of the removed septic system. Methods employed included: visual inspection, electromagnetic induction conductivity detection, ground-penetrating radar (GPR), and electromagnetic pipe and cable location.

Electromagnetic induction conductivity detection ground induction methods are employed to detect broad metal mass anomalies or conductive zones that may be indicative of potential septic tanks, and lateral changes in conductive zones of soil or backfill materials relative to native soil. GPR is used to detect abandoned septic tank excavation sidewalls and fill areas. An electromagnetic pipe and cable survey was conducted to detect buried utility lines.

Electromagnetic and GPR surveys were conducted at Building 1176 in June 2012. The location of the removed septic tank and leach field were identified, approximately 20 ft south of Building 1176. The locations of the individual leach field piping could not be directly detected by the geophysical survey due to the similarity of composition of the clay pipes and the surrounding soil. However, the leach field could be identified by the geophysical survey equipment due to the differences in mineralization and conductivity between the native soil and the soils that were physically affected by normal leach field operation. The presence of the leach field piping was assumed within the leach field as identified by the geophysical survey which allowed for representative soil and groundwater sample collection. Underground utility locations were delineated to guide the soil boring placement. Geophysical findings are shown on Figure 3-1. The complete geophysical report is included in Appendix B.

3.3 Soil Investigation

The soil investigation of the removed septic tank at Building 1176 was conducted on July 6, 2012. The program consisted of sampling four borings advanced at the former septic tank location, as shown on Figure 3-1. Soil boring OT-C544-Station 1 (sample numbers OTC544-IS-0001-070612 and OTC544-IS-0002-070612) was placed north of the removed septic tank along the influent line, OT-C544-Station 2 (sample numbers OTC544-IS-0003-070612 and

OTC544-IS-0004-070612) was placed at the former septic tank location, OT-C544-Station 3 (samples numbers OTC544-IS-0005-070612 and OTC544-IS-0006-070612) was placed south of the removed septic tank near the effluent line, and OT-C544-Station 4 (sample numbers OTC544-IS-0007-070612, OTC544-IS-0008-070612-FD, OTC544-IS-0009-070612, OTC544-IS-0010-070612, and OTC544-IS-0011-070612) was placed in the leach field of the former septic tank. All borings were advanced using direct push technology (DPT), with soil samples collected at depths of 3 to 5 ft and 10 to 12 ft at OT-C544-Station 1; and 7 to 9 ft and 14 to 16 ft at OT-C544-Station 2; 3 to 5 ft and 10 to 12 ft at OT-C544-Station 3; and 0 to 2, 3 to 5 ft, 10 to 12, and 14 to 16 ft at OT-C544-Station 4 (Appendix C has copies of the sample collection logs). A field duplicate was collected from the 3 to 5 ft depth at OT-C544-Station 4.

Soil samples were logged in the field in accordance with the Unified Soil Classification System requirements, and sample depths were in general accordance with the *RFI Work Plan* (USACE, 2010). Soil samples were not screened with a photoionization detector since there was no sensory evidence of contamination. Appendix D contains copies of the soil boring logs.

Soil samples for volatile organic compound (VOC) analysis were collected in accordance with EPA Method 5035, using a TerraCore® Sampler device (EPA, 1986), while non-VOC sample aliquots were placed in laboratory-provided containers. Samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), explosives, polychlorinated biphenyls (PCBs), target analyte list (TAL) metals, total petroleum hydrocarbons (TPH)-gasoline range organics (GRO), TPH-diesel range organics (DRO), TPH-oil range organics (ORO), cyanide, percent solids, and tritium by Accutest Laboratories, Inc., a National Environmental Laboratory Accreditation Program-accredited laboratory, using EPA analytical methods, as summarized on Table 3-1.

The excess sample core soil extracted using the DPT drilling method was placed in 55-gallon drums for later characterization and transport to a licensed disposal facility. The boreholes were abandoned upon completion by plugging from the bottom of the borehole to ground surface using bentonite pellets, then covered with gravel to match the surrounding land surface contour. Soil boring equipment was decontaminated between borings as detailed in Holloman AFB Standard Operating Procedure 2, “Sampling Equipment Decontamination” which is provided in Appendix B of the *RFI Work Plan* (USACE, 2010) and Shaw’s Standard Operating Procedure No. EI-FS-014, “Decontamination of Contact Sampling Equipment.”

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3.4 Groundwater Investigation

One monitoring well was installed at the Building 1176 to determine potential impacts to groundwater from the former septic system. Monitoring well OTC544-MW01 was installed in the leach field, approximately 40 ft south of the former septic tank location, as shown on Figure 3-1.

The monitoring well was installed using hollow-stem auger drilling techniques in accordance with NMED Ground Water Quality Bureau *Monitoring Well Construction and Abandonment Guidelines* (NMED, 2011). The 10-inch borehole was advanced approximately 4 ft into the water table at approximately 17 ft bgs, and completed such that the top of the well screen was set above the approximate level of the groundwater observed during drilling. The monitoring well was constructed of 2-inch-diameter Schedule-40 polyvinyl chloride riser with 2-inch diameter, Schedule-40 polyvinyl chloride screen fitted with pre-packed, very fine stainless-steel meshing (Appendix E). The screened section of the well was 5 ft long (as opposed to the stipulated 10 ft in the *RFI Work Plan* (USACE, 2010); the variance is based on observed lithology). A silica sand filter pack was placed around the screen to approximately 3 ft above the top of the screen, with a 2-ft thick bentonite seal placed above the filter pack. The remaining annular space was grouted with cement and bentonite.

The monitoring well was constructed as a "flush-mount" surface completion with a water-tight well vault, locking, expandable well plug, and finished to surrounding grade. Table 3-2 and Appendix E provide monitoring well construction details.

The newly-installed monitoring well was developed to create an effective filter pack around the well screen, remove fine particles from the formation near the borehole, and assist in restoring the natural water quality of the aquifer in the vicinity of the well. Development occurred three days after installation to allow for grout curing. Surging and pumping were both employed to achieve the most effective well development.

Information recorded during well development included water-level measurements, depth-to-bottom measurements, water-quality parameters (pH, temperature, and specific conductance), discharge-water color, and time period. Well development was performed until the following criteria were met:

- Water removed from the well was visually clear, and the turbidity was reduced during well development to less than 55 nephelometric turbidity units.
- The pH, temperature, and specific conductance parameters were stabilized (less than 10 percent variation for three successive readings).

Groundwater sampling was conducted at OTC544-MW01 on September 4, 2012 using low-flow sampling techniques. Water quality indicator parameters were measured and recorded during purging of the monitoring wells (Appendix F) using a field-calibrated water quality meter. Table 3-3 contains final water quality readings from the sampling event. Groundwater samples were collected once indicator parameters had stabilized, and analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium by Accutest Laboratories, Inc.

3.5 Investigation-Derived Waste

The nonhazardous IDW that were generated during the Building 1176 RFI were segregated into the following categories:

- Soil – drill cuttings soil
- Water – decontamination liquids and purge water.

Upon generation, IDW was properly containerized and temporarily stored at the designated laydown yard, as specified by Holloman AFB. Wastes were contained in sealed, U.S. Department of Transportation–approved, steel 55-gallon drums (for soil cuttings and decontamination water), roll-off containers with liners and covers (for excavated waste soil), and a 1,400-gallon plastic tank (for wastewater). The waste soil drums were emptied into 20-cubic yard roll-off containers, and the wastewater was pumped into a bulk plastic tank prior to characterization sampling and analysis for disposal. The drill cuttings from the Building 1176 site were placed into the 20-cubic yard roll-off containers along with soils from other Holloman AFB investigation sites.

3.6 Site Surveying

Soil borings, monitoring well, and other site features shown on Figure 3-1 were surveyed by Albuquerque Surveying Company, Inc. from Albuquerque, New Mexico, a state-licensed surveyor.

Horizontal coordinates are referenced to the North American Datum 1983 State Plane Coordinate System, New Mexico-Central, and surveyed to an accuracy of $\pm$1.0 ft. Vertical elevations are referenced to the North American Vertical Datum 1988 coordinate system to an accuracy of $\pm$0.01 ft. A copy of the survey results is presented in Appendix G.

3.7 Decontamination Procedures

A decontamination pad was constructed at the designated laydown area for decontamination of all downhole drilling equipment. The drilling rig was decontaminated prior to entering the site. Drilling equipment that came into contact with the borehole was decontaminated by

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hot-water pressure washing. Disposable equipment used for soil sample collection did not require decontamination.

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4.0 INVESTIGATION RESULTS AND EVALUATION

Soil analytical results presented in this section were used to delineate constituents of concern that may have been released to the environment, and confirm that no additional remedial measures are required.

4.1 Soil Analytical Results

DPT soil boring samples and post-excavation confirmation samples were collected during the Building 1176 RFI, at the locations shown on Figure 3-1. All soil samples were sent to Accutest Laboratories, Inc., for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium analyses. Analytical results for the soil samples are presented in Table 4-1. Laboratory analytical data packages, and the data validation checklists for the soil sample data, are provided in Appendix H.

The analytical results for metals in Table 4-1 show that Holloman AFB soil samples contain significant amounts of calcium, typically greater than 100,000 milligrams per kilogram (mg/kg) (10 percent), and can be as high as 250,000 mg/kg (25 percent). Calcium at these levels contributes spectral interferences during inductively-coupled plasma metals analysis, and can also clog the nebulizer that is used to introduce the sample. Sample dilution is the recommended method for solving both the spectral interference issue and the nebulizer clogging issue. However, sample dilution raises the analytical method detection limits (MDLs) for all associated metals, including thallium.

A typical method detection limit for thallium during inductively-coupled plasma analysis is 0.13 mg/kg. Diluting by a factor of 5 to 20 to eliminate calcium spectral interference and nebulizer clogging causes the thallium detection limit to be elevated by a factor of 5 to 20. This results in a MDL that is above the NMED residential SSL of 0.782 mg/kg thallium. Consequently, the required remedy to allow for proper equipment operation resulted in MDLs that were above the NMED residential SSL. However, thallium is not an element that is anticipated to be present at Building 1176 as a result of normal septic tank operation and maintenance.

The validated soil analytical results were compared with the NMED residential SSLs (NMED, 2012a), or the EPA RSLs (EPA, 2012a), if NMED residential SSLs have not been established for a given analyte, and the NMED-approved Holloman AFB background soil values. In addition, a TPH screening level of 1,000 mg/kg was used to evaluate the laboratory analytical data. The 1,000 mg/kg action level for petroleum-contaminated soil is the Residential Direct Exposure Limit for unknown oil, listed in Table 6-2 (TPH Screening

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Guidelines for Potable Groundwater) of the *Risk Assessment Guidance for Site Investigations and Remediation* (NMED, 2012a).

No parameters had detections above the NMED residential SSLs in any of the soil samples collected at Building 1176. Likewise, all soil samples from all locations and depths had TPH-GRO, TPH-DRO, and TPH-ORO concentrations below the TPH screening level.

Antimony was detected in OTC544-IS-0006-070612 at a concentration of 3.9 mg/kg and in OTC544-IS-0008-070612 at a concentration of 3.7 mg/kg. These detections exceed the Holloman AFB soil background value (1.6 mg/kg), but are below the NMED residential SSL (31.3 mg/kg). No other soil detections exceeded the Holloman AFB soil background values.

4.2 Groundwater Analytical Results

One monitoring well (OTC544-MW01) was installed during the removed septic tank investigation, as shown on Figure 3-1. Groundwater from the well was analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium by Accutest Laboratories, Inc. Detections were compared to the NMWQCC WQS and EPA drinking water MCLs. The Building 1176 groundwater sample had a TDS value below 10,000 mg/L.

Analytical results for the Building 1176 groundwater samples are shown in Table 4-2. Note that sample OTC544-GW-5441-090412 was analyzed for nitrobenzene by EPA Method 8270D, as well as by EPA Method 8330A. Nitrobenzene was detected at a concentration of 18.5 micrograms per liter (µg/L) by Method 8270D, but was not detected by Method 8330A (detection limit of 0.08 µg/L). The nitrobenzene concentration reported from Method 8270D is suspected by the laboratory to be contamination as the extraction batch contained a sample with an elevated nitrobenzene concentration (341,000 µg/L). These two lines of evidence (i.e., the non-detection of nitrobenzene via Method 8330A and the suspected laboratory contamination during the Method 8270D run) indicate that the Method 8330A result is the more accurate result and, therefore representative of actual site conditions. Therefore, the nitrobenzene detection of 18.5 µg/L in sample OTC544-GW-5441-090412 was not further evaluated, and the non-detect result via Method 8330A was used in this report. All other analytical parameter concentrations were below NMWQCC WQS and EPA drinking water MCLs.

4.3 Investigation-Derived Waste Analytical Results

Waste characterization samples were collected from the bulk waste soil for analysis of Toxicity Characteristic Leaching Procedure VOCs, SVOCs, and RCRA metals. The results are presented in Table 4-3. The results of the waste soil analysis returned no concentrations

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above 40 Code of Federal Regulations Part 261.24 limits. Therefore, the waste soil could be managed as nonhazardous waste and was subsequently transported to Otero/Greentree Regional Landfill, Alamogordo, New Mexico for disposal. The wastewater from equipment decontamination was sampled and analyzed for VOCs, SVOCs, TAL metals, TPH-GRO, TPH-DRO, and TPH-ORO, with the analytical results presented in Table 4-4. The analytical results were reviewed by the Holloman AFB wastewater treatment plant personnel, and subsequently accepted for disposal. A copy of the waste manifest is provided in Appendix I.

4.4 Risk-Based Evaluation

4.4.1 Soil

Eleven soil samples were collected at Building 1176, from depths of 0 to 16 ft bgs, during the removed septic tank investigation. Per NMED (2012a), the soil depths of interest for a risk evaluation are 0 to 10 ft bgs for construction workers and residential receptors, and 0 to 1 ft bgs for commercial/industrial workers. Therefore, results from the screening assessment (Table 4-1) that present data for 0 to 10 ft bgs were used for this risk evaluation. Based on the initial results of the screening evaluation, no constituents of potential concern (COPC) have a concentration greater than NMED residential SSLs (or EPA residential RSLs, when no NMED value has been established). Total cancer risk ratios and total hazard ratios (hazard index [HI]) to address potential additive toxicological effects were also assessed (per NMED 2012a, Section 5.0). This was conducted by using maximum detected concentrations of carcinogens and non-carcinogens, estimating risk and hazard ratios, and scaling a total cancer risk and total HI. The total cancer risk did not exceed 1.0×10^{-5} (total cancer risk: 3.6×10^{-6}), as shown in Appendix J. The total HI based on maximum detected concentrations was equal to 0.46 (Appendix J). As the target HI is 1.0, this is acceptable because the HI does not exceed 1.0.

Therefore, as no COPCs were selected for soil, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not health risks.

4.4.2 Groundwater

One groundwater sample was collected from the Building 1176 monitoring well OTC544-MW01 on September 4, 2012. Based on the results of the screening evaluation (Table 4-2), no chemicals have concentrations greater than NMWQCC WQS or EPA drinking water MCLs. Therefore, as no chemicals in groundwater were selected, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not health risks.

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4.4.3 Risk-Based Conclusions

No COPCs were selected in soil or groundwater. Therefore, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not health risks. Additionally, total cancer risks and non-cancer hazards in soil were acceptable.

4.5 Ecological Evaluation

The former septic system at Building 1176 was located on a gently-sloped surface on the building's southern side. The ground surface at this location consists of soil with moderate vegetation at or adjacent to this area. As such, a screening-level ecological risk assessment (SLERA) Scoping Assessment Site Assessment Checklist was completed for the Building 1176 (OT-C544) septic tank system and is included in Appendix K. Results of the checklist Exclusion Criteria Decision Tree indicate that the site is a potential viable ecological habitat and a potential exposure pathway exists for soil; therefore, the SLERA was completed.

Soil data results from 0 to 10 ft bgs were included in the comparison and are provided on Table A of Appendix K. According to NMED (2012c), this is the potential depth of interest for wildlife, including burrowing animals. As shown on Table A (Appendix K), six soil samples were available within the 0 to 10 ft bgs zone. Detected constituents in soil included 16 metals, one SVOC, TPH (DRO only). All other constituents analyzed for were not detected.

Metals concentrations were compared to Holloman soil background values (Table A, Appendix K). Detected concentrations of metals, except antimony, did not exceed the Holloman AFB soil background values in any soil samples evaluated. A single detection of antimony from the depth interval of interest was greater than the Holloman AFB site-specific background value and, therefore, was evaluated further in this report. All of the other metals detected were present at concentrations below background screening values and were not evaluated further.

Antimony was detected in one of six soil samples collected from the former Building 1176 (OT-C544) septic system. The detected concentration of antimony in soil data collected at the site was compared to the lowest available ecological screening levels (ESLs) presented in the Los Alamos National Laboratory (LANL) Eco Risk Database version 3.1 (LANL, 2012). The LANL database provides both No-Effect ESLs and Low-Effect ESLs for soil, and both values are provided in Table A, Appendix K. The single detected concentration of antimony (3.7 mg/kg) exceeded both the No-Effect ESL (0.05 mg/kg) and the Low-Effect ESL (0.5 mg/kg). The endpoint of concern for the ESLs of 0.05 mg/kg and 0.5 mg/kg is for potential terrestrial plant impacts. Antimony ESLs (from LANL, 2012) are as follows:

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Receptor	No-Effect ESL	Low-Effect ESL	Units
Deer mouse (Mammalian omnivore)	0.48	4.8	mg/kg
Desert cottontail (Mammalian herbivore)	2.9	29	mg/kg
Earthworm (Soil-dwelling invertebrate)	78	780	mg/kg
Generic plant (Terrestrial autotroph - producer)	0.05	0.5	mg/kg
Montane shrew (Mammalian insectivore)	0.26	2.6	mg/kg
Red fox (Mammalian top carnivore)	45	450	mg/kg

Additionally, the detected concentration of antimony (3.7 mg/kg) exceeded four No-Effect ESLs and two Low-Effect ESLs, all for either plants or mammalian receptors (out of six available receptor ESLs). Therefore, a more detailed evaluation was conducted.

Bis(2-ethylhexyl) phthalate was detected in one of six soil samples collected from the former Building 1176 (OT-C544) septic system. Detected concentrations of bis(2-ethylhexyl) phthalate in soil data collected at the site were compared to the lowest available ESLs presented in the LANL Eco Risk Database version 3.1 (LANL, 2012). Both the No-Effect ESLs and Low-Effect ESLs for soil are provided in Table A of Appendix K. The single detected concentration of bis(2-ethylhexyl) phthalate (0.144 mg/kg) exceeded the No-Effect ESL (0.02 mg/kg), but was below the Low-Effect ESL (0.2 mg/kg). The endpoint of concern for the ESLs of 0.02 mg/kg and 0.2 mg/kg is potential food chain impacts for an avian insectivore. Bis(2-ethylhexyl) phthalate ESLs (from LANL, 2012) are as follows:

Receptor	Low-Effect ESL	Low-Effect ESL	Units
American kestrel (Avian intermediate carnivore)	0.045	0.45	mg/kg
American kestrel (Avian insectivore)	0.02	0.2	mg/kg
American kestrel (Avian top carnivore)	0.033	0.33	mg/kg
American robin (Avian herbivore)	20	200	mg/kg
American robin (Avian omnivore)	0.04	0.4	mg/kg
Deer mouse (Mammalian omnivore)	1.1	11	mg/kg
Desert cottontail (Mammalian herbivore)	2700	27000	mg/kg
Montane shrew (Mammalian insectivore)	0.59	5.9	mg/kg
Red fox (Mammalian top carnivore)	1.2	12	mg/kg

Therefore, the detected concentration of bis(2-ethylhexyl) phthalate (0.144 mg/kg) exceeded four No-Effect ESLs, all for avian receptors (out of nine available receptor ESLs). Therefore, a more detailed evaluation was conducted.

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Per the *RFI Work Plan* (USACE, 2010), more representative site-specific EPCs should be compared with screening values. EPCs are based on 95 percent upper confidence limit (UCL) of the mean, if possible, estimated using EPA's ProUCL statistical software, version 4.1.01 (EPA, 2010 and EPA, 2011). However, as only one antimony and bis(2-ethylhexyl) phthalate detected result existed in the data set available for OT-C544, ProUCL would not run, and gave the following warning statements:

> "Warning: Only one distinct data value was detected. ProUCL (or any other software) should not be used on such a data set. It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV). The data set for variable antimony and bis(2-ethylhexyl) phthalate was not processed!"

Although this warning indicates other software should not be used, alternative values may be considered. Therefore, a 95 percent UCL value was derived using a Bootstrap-t statistical program, described by Efron (1982) and discussed in EPA (1997). Non-detect values, if present, were represented in this Bootstrap-t program as random numbers between zero and the detection limit that were generated by the iterative process written into the program.

The Bootstrap-t method is a nonparametric method recommended by EPA for censored data and was used to calculate 95 percent UCLs for antimony and bis(2-ethylhexyl) phthalate when ProUCL would not run. Bootstrap 95 percent UCLs were calculated as follows (Efron and Tibshirani, 1993):

1. The data set was randomly resampled with replacement;
2. The arithmetic mean of the resampled data set was estimated;
3. Steps 1 and 2 were performed 2,000 times and created a new data set of 2,000 resampled means; and
4. The 95th percentile of the resampled mean data set created during Step 3 was selected.

Per Efron and Tibshirani (1993), the 95th percentile of the resampled mean data set is a good approximation of the 95 percent UCL on the mean of the original data set.

Using this Bootstrap method, the 95 percent UCL for antimony in soil is 1.63 mg/kg (Appendix K). The antimony EPC still exceeds the lowest No-Effect ESL (0.05 mg/kg) for plants, and also exceeds the Low-Effects ESL (0.5 mg/kg). Additionally, the EPC of

1.63 mg/kg exceeds three of the six LANL No-Effect ESLs (as previously shown), but exceeds only the lowest Low-Effect ESL (i.e., 0.5 mg/kg for plants).

Using this Bootstrap method, the 95 percent UCL for bis(2-ethylhexyl) phthalate in soil is 0.0805 mg/kg (Appendix K). The bis(2-ethylhexyl) phthalate EPC exceeds the lowest No-Effect ESL (0.02 mg/kg) for an avian insectivore, but does not exceed the Low-Effect ESL (0.2 mg/kg). The EPC of 0.0805 mg/kg exceeds four of the nine LANL No-Effect ESLs, but no Low-Effect ESLs are exceeded. The lowest No-Effect ESL (0.02 mg/kg) is for an avian insectivore (American kestrel). The American kestrel has an average territory of 314 acres (EPA, 1993).

Antimony and bis(2-ethylhexyl) phthalate were each detected in one of six soil samples collected in the 0 to 10 ft bgs zone. The antimony EPC exceeds three of six No-Effect ESLs, but only the lowest Low-Effect ESL is exceeded by the EPC. The bis(2-ethylhexyl) phthalate EPC exceeds four of nine No-Effect ESLs, but none of the lowest Low-Effect ESLs is exceeded by the EPC. Since the antimony Low-Effect ESL for plants of 0.5 mg/kg is exceeded by both the detected value and the 95 percent UCL, adverse effects to plants cannot be ruled out. However, since none of the bis(2-ethylhexyl) phthalate Low-Effect ESLs are exceeded by the EPCs, it is reasonable to conclude that adverse effects to ecological receptors are unlikely to occur.

Two additional factors related to the specific soil sample results were also considered. The first factor is that bis(2-ethylhexyl) phthalate is a common laboratory contaminant. It is possible that the presence of this chemical in soil at Building 1176 is related to standard operational procedures employed by the subcontracted laboratory, rather than it being related to site activities associated with the former septic system. The second factor is that the single detection of antimony above ESLs was identified in the field duplicate sample, but was non-detected in the original soil sample, from the depth interval of 3 to 5 ft bgs. In both cases, the single detections of these constituents may be related to sampling or laboratory effects and may not actually be site related (especially since these two constituents are not typically associated with septic systems).

Furthermore, for Building 1176, the investigation of the former septic system focused on the area of the former septic tank and its associated leach field. This area is estimated to be approximately 0.02 acres. Of the receptors evaluated by LANL, the deer mouse, the montane shrew, and the desert cottontail would be the receptors most likely to be impacted by constituents in soil at the site due to these receptor's very small territories or home ranges and close association with soil. However, site maximum and 95 percent UCL concentrations of bis(2-ethylhexyl) phthalate are less than the ESLs for these receptors. Therefore, it is concluded that risks to sensitive wildlife receptors at and surrounding the site are generally

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acceptable because of the very small size of the site (i.e., the impacted soil area is only 0.02 acres) and the finding that potentially sensitive avian receptors such as the American kestrel have very large territories (exceeding approximately 300 acres).

5.0 DATA QUALITY ASSURANCE AND DATA QUALITY CONTROL REVIEW

All analytical data was reviewed in accordance with EPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA, 2004a) and the EPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (EPA, 2004b). Data qualifiers were added to the database prior to project use. The data tables provided in Section 4.0 show the data qualifiers added during data validation. Detailed data validation checklists for each data deliverable are provided in Appendix H.

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6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary and Conclusions

6.1.1 Soil

Eleven soil samples were collected at various Holloman AFB Building 1176 locations during the removed septic tank investigation. The samples were analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, cyanide, percent solids, and tritium. Validated analytical results were compared with the NMED residential SSLs Or EPA RSLs when an NMED SSL has not been established) and the NMED Residential Direct Exposure Limit for soil contaminated with unknown petroleum oil, and the Holloman AFB soil background values. Two samples exceeded the Holloman AFB soil background screening value for antimony. However, no samples had constituent concentrations that exceeded the NMED residential SSL. TPH was not detected above the limit of 1,000 mg/kg in any of the soil samples from any depth or location. Therefore, as no COPCs were selected for soil, future residential exposure, current and future commercial/industrial worker exposure, and current and future construction worker exposure scenarios are not health risks.

The ecological evaluation identified antimony and bis(2-ethylhexyl) phthalate as constituents that could potentially impact ecological receptors. The results of the evaluation were that for antimony adverse effects to plants cannot be ruled out, and for bis(2-ethylhexyl) phthalate adverse effects to ecological receptors are unlikely to occur. The ecological evaluation concluded that that risks to sensitive receptors at and surrounding the site are generally acceptable because of the very small size of the site (i.e., the impacted soil area is only 0.02 acres).

6.1.2 Groundwater

One groundwater sample was collected from the Building 1176 monitoring well OTC544-MW01. The sample was analyzed for VOCs, SVOCs, explosives, PCBs, TAL metals, TPH-GRO, TPH-DRO, TPH-ORO, TDS, cyanide, and tritium. No parameters had concentrations greater than the NMWQCC WQS or the EPA drinking water MCLs.

Risk-based health screening concluded that there were no COPCs identified for groundwater.

6.2 Recommendations

6.2.1 Soil

No COPCs were detected in soil above the NMED residential SSLs criteria and no unacceptable ecological risk was identified for the site and its surroundings. Therefore, no corrective action is recommended for soil at Building 1176.

6.2.2 Groundwater

No COPCs were detected in groundwater above the NMWQCC WQS or EPA drinking water MCLs. Therefore, no corrective action is recommended for groundwater at Building 1176.

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Tables

Table 3-1
Sample Summary
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Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C544-Station 1	685150.8683	1670599.6576	7/6/2012	Investigation Soil	3 - 5	OTC544-IS-0001-070612	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/6/2012	Investigation Soil	10 - 12	OTC544-IS-0002-070612	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OT-C544-Station 2	685143.8693	1670602.2819	7/6/2012	Investigation Soil	7 - 9	OTC544-IS-0003-070612	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/6/2012	Investigation Soil	14 - 16	OTC544-IS-0004-070612	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OT-C544-Station 3	685137.4282	1670600.6963	7/6/2012	Investigation Soil	3 - 5	OTC544-IS-0005-070612	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/6/2012	Investigation Soil	10 - 12	OTC544-IS-0006-070612	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
OTC544-MW01 (OT-C544-Station 4)	685104.7396	1670587.9720	7/6/2012	Investigation Soil	3 - 5	OTC544-IS-0007-070612	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/6/2012	Investigation Soil Field Duplicate	3 - 5	OTC544-IS-0008-070612-FD	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Station Name	Grid Coordinates[a]		Sample Date	Sample Type	Sample Depth (ft bgs)	Sample Number	Analytical Suite	Analytical Method[b]
	Northing	Easting						
OTC544-MW01 (OT-C544-Station4)	685104.7396	1670587.9720	7/6/2012	Investigation Soil	10 - 12	OTC544-IS-0009-070612	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/6/2012	Investigation Soil	0 - 2	OTC544-IS-0010-070612	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			7/6/2012	Investigation Soil	14 - 16	OTC544-IS-0011-070612	Percent Solids	SM2540G
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7471B
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B
			9/4/2012	Groundwater	NA	OTC544-GW-5441-090412	TDS	SM2540C
							Tritium	E906.0
							TAL Metals	SW6010C
								SW7470A
							TPH-DRO/GRO/ORO	SW8015C
							PCBs	SW8082A
							VOCs	SW8260B
							SVOCs	SW8270D
							Explosives	SW8330A
							Total Cyanide	SW9012B

Table 3-1
Sample Summary
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

[a] Coordinates are referenced to the North American Datum, 1983 State Plane Coordinate System, New Mexico - Central, feet.

[u] EPA, 2007, Test Methods for Evaluating Soil Waste Physical/Chemical Methods, EPA Publication SW-846, Final Update IV. Available online at www.epa.gov/osw/hazard/testmethods/sw846.

Percent Solids and Total Dissolved Solids from *Standard Methods for the Examination of Water and Wastewater* , 19th edition, 1995.

bgs	Below ground surface.
DRO	Diesel range organics.
EPA	Environmental Protection Agency
FD	Field Duplicate.
ft	Feet/foot.
GRO	Gasoline range organics.
GW	Groundwater.
IS	Investigation Soil.
MW	Monitoring Well.
NA	Not Applicable.
ORO	Oil range organics.
PCB	Polychlorinated Biphenyl.
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SVOC	Semivolatile organic compound.
TAL	Target analyte list.
TDS	Total Dissolved Solids.
TPH	Total petroleum hydrocarbons.
VOC	Volatile organic compound.

Table 3-2
Monitoring Well Construction Details and Groundwater Elevation Data
Building 1176 (OT-C544)
Holloman Air Force Base, New Mexico

Well ID	Monitoring Well Construction Details						Groundwater Elevation Data: 9/4/2012		
	Location Coordinates		Installation Date	Well Diameter (in)	Well Depth at Construction (ft bgs)	Screened Interval (ft bgs)	Top of PVC Riser Pipe Elevation[b] (ft amsl)	Depth to Water (ft below top of PVC riser pipe)	Potentiometric Surface Elevation[b] (ft amsl)
	Grid Northing[a]	Grid Easting[a]							
OTC544-MW01	685104.7396	1670587.9720	7/6/2012	2	21.0	16.0-21.0	4048.52	16.80	4031.72

[a] Location coordinates are referenced to the North American Datum 1983 State Plane Coordinate System, New Mexico - Central, feet.

[b] Elevations are referenced to the North American Vertical Datum of 1988 (NAVD 88).

ft = feet
ft amsl = feet above mean sea level
ft bgs = feet below ground surface
ID = identification
in = inches
PVC = polyvinyl chloride

Table 3-3
Monitoring Well Purge Water Quality Parameters
Building 1176 (OT-C544)
Holloman Air Force Base, New Mexico

Well ID	Sample Date	Depth to Water (ft below top of PVC riser pipe)	Total Depth (ft below top of PVC riser pipe)	Purge Water Volume (gallons)	Temperature (°C)	pH	Conductivity (mS/cm)	Turbidity (NTU)	DO (mg/L)	ORP (mV)	TDS (g/L)
OTC544-MW01	9/4/2012	16.80	21.1	1.0	21.00	7.39	5.994	2.3	5.89	42.7	3.89

°C = degrees Celsius
DO = dissolved oxygen
ft = feet
g/L = grams per liter
ID = identification
mg/L = milligrams per liter
mS/cm = millisiemens per centimeter
mV = millivolts
NTU = Nephelometric Turbidity Unit
ORP = oxidation-reduction potential
PVC = polyvinyl chloride
TDS = total dissolved solid

Table 4-1
Soil Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC544-IS-0001-070612		OTC544-IS-0002-070612		OTC544-IS-0003-070612		OTC544-IS-0004-070612		OTC544-IS-0005-070612		OTC544-IS-0006-070612		OTC544-IS-0007-070612		OTC544-IS-0008-070612-FD		OTC544-IS-0009-070612		OTC544-IS-0010-070612		OTC544-IS-0011-070612	
				Sample Date	7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12		0 - 2		14 - 16	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**79.9**		**82**		**81.9**		**82.8**		**82.2**		**82.5**		**77.5**		**78.7**		**86.8**		**80.2**		**83**	
VOLATILES (mg/kg)																										
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.002	U	0.0012	U	0.0017	U	0.0016	U	0.0018	U	0.0018	U	0.0022	U	0.0015	U	0.0013	U	0.0013	U	0.0015	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0022	U	0.0013	U	0.0018	U	0.0017	U	0.0019	U	0.002	U	0.0024	U	0.0016	U	0.0014	U	0.0014	U	0.0016	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0031	U	0.0018	U	0.0026	U	0.0024	U	0.0027	U	0.0028	U	0.0034	U	0.0023	U	0.002	U	0.002	U	0.0023	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.002	U	0.0012	U	0.0017	U	0.0016	U	0.0018	U	0.0018	U	0.0022	U	0.0015	U	0.0013	U	0.0013	U	0.0015	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.002	U	0.0012	U	0.0017	U	0.0016	U	0.0018	U	0.0018	U	0.0022	U	0.0015	U	0.0013	U	0.0013	U	0.0015	U
1,1-DICHLOROETHENE	NE	240	449		0.0025	U	0.0015	U	0.0021	U	0.002	U	0.0022	U	0.0023	U	0.0028	U	0.0019	U	0.0016	U	0.0016	U	0.0019	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0022	UJ	0.0013	U	0.0018	U	0.0017	U	0.0019	U	0.002	U	0.0024	U	0.0016	U	0.0014	U	0.0014	U	0.0016	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0042	U	0.0024	U	0.0035	U	0.0033	U	0.0037	U	0.0038	U	0.0046	U	0.0031	U	0.0027	U	0.0026	U	0.0031	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.0018	U	0.0011	U	0.0015	U	0.0014	U	0.0016	U	0.0017	U	0.002	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.002	U	0.0012	U	0.0017	U	0.0016	U	0.0018	U	0.0018	U	0.0022	U	0.0015	U	0.0013	U	0.0013	U	0.0015	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.0018	U	0.0011	U	0.0015	U	0.0014	U	0.0016	U	0.0017	U	0.002	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0022	U	0.0013	U	0.0018	U	0.0017	U	0.0019	U	0.002	U	0.0024	U	0.0016	U	0.0014	U	0.0014	U	0.0016	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0022	U	0.0013	U	0.0018	U	0.0017	U	0.0019	U	0.002	U	0.0024	U	0.0016	U	0.0014	U	0.0014	U	0.0016	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.002	UJ	0.0012	U	0.0017	U	0.0016	U	0.0018	U	0.0018	U	0.0022	U	0.0015	U	0.0013	U	0.0013	U	0.0015	U
2-HEXANONE	NE	210	NE		0.0098	U	0.0057	U	0.0081	U	0.0077	U	0.0086	U	0.0089	U	0.011	U	0.0072	U	0.0063	U	0.0062	U	0.0073	U
ACETONE	NE	61000	66600		0.036	U	0.021	U	0.03	U	0.029	U	0.032	U	0.033	U	0.04	U	0.027	U	0.024	U	0.023	U	0.027	U
BENZENE	NE	1.1	15.4		0.0027	U	0.0016	U	0.0023	U	0.0021	U	0.0024	U	0.0025	U	0.003	U	0.002	U	0.0018	U	0.0017	U	0.002	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.002	U	0.0012	U	0.0017	U	0.0016	U	0.0018	U	0.0018	U	0.0022	U	0.0015	U	0.0013	U	0.0013	U	0.0015	U
BROMOFORM	NE	62	616		0.0027	U	0.0016	U	0.0023	U	0.0021	U	0.0024	U	0.0025	U	0.003	U	0.002	U	0.0018	U	0.0017	U	0.002	U
BROMOMETHANE	NE	7.3	16.5		0.0036	U	0.0021	U	0.003	U	0.0029	U	0.0032	U	0.0033	U	0.004	U	0.0027	U	0.0024	U	0.0023	U	0.0027	U
CARBON DISULFIDE	NE	820	1530		0.0036	U	0.0021	U	0.003	U	0.0029	U	0.0032	U	0.0033	U	0.004	U	0.0027	U	0.0024	U	0.0023	U	0.0027	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0033	U	0.0019	U	0.0027	U	0.0026	U	0.0029	U	0.003	U	0.0036	U	0.0024	U	0.0021	U	0.0021	U	0.0024	U
CHLOROBENZENE	NE	290	376		0.0018	U	0.0011	U	0.0015	U	0.0014	U	0.0016	U	0.0017	U	0.002	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
CHLOROETHANE	NE	15000	29800		0.0036	U	0.0021	U	0.003	U	0.0029	U	0.0032	U	0.0033	U	0.004	U	0.0027	U	0.0024	U	0.0023	U	0.0027	U
CHLOROFORM	NE	0.29	5.86		0.0022	U	0.0013	U	0.0018	U	0.0017	U	0.0019	U	0.002	U	0.0024	U	0.0016	U	0.0014	U	0.0014	U	0.0016	U
CHLOROMETHANE	NE	120	275		0.0036	U	0.0021	U	0.003	U	0.0029	U	0.0032	U	0.0033	U	0.004	U	0.0027	U	0.0024	U	0.0023	U	0.0027	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0027	U	0.0016	U	0.0023	U	0.0021	U	0.0024	U	0.0025	U	0.003	U	0.002	U	0.0018	U	0.0017	U	0.002	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0018	U	0.0011	U	0.0015	U	0.0014	U	0.0016	U	0.0017	U	0.002	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
CYCLOHEXANE	NE	7000	NE		0.0025	U	0.0015	U	0.0021	U	0.002	U	0.0022	U	0.0023	U	0.0028	U	0.0019	U	0.0016	U	0.0016	U	0.0019	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.0018	U	0.0011	U	0.0015	U	0.0014	U	0.0016	U	0.0017	U	0.002	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0027	U	0.0016	U	0.0023	U	0.0021	U	0.0024	U	0.0025	U	0.003	U	0.002	U	0.0018	U	0.0017	U	0.002	U
ETHYLBENZENE	NE	5.4	68.4		0.0018	U	0.0011	U	0.0015	U	0.0014	U	0.0016	U	0.0017	U	0.002	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
ISOPROPYLBENZENE	NE	2100	2430		0.002	U	0.0012	U	0.0017	U	0.0016	U	0.0018	U	0.0018	U	0.0022	U	0.0015	U	0.0013	U	0.0013	U	0.0015	U
METHYL ACETATE	NE	78000	78200		0.023	U	0.013	U	0.019	U	0.018	U	0.02	U	0.021	U	0.025	U	0.017	U	0.015	U	0.014	U	0.017	U
METHYL ETHYL KETONE	NE	28000	37100		0.011	U	0.0065	U	0.0092	U	0.0087	U	0.0097	U	0.01	U	0.012	U	0.0081	U	0.0072	U	0.007	U	0.0082	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0099	U	0.0059	U	0.0083	U	0.0079	U	0.0088	U	0.0091	U	0.011	U	0.0073	U	0.0065	U	0.0063	U	0.0074	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0024	U	0.0014	U	0.002	U	0.0019	U	0.0021	U	0.0021	U	0.0026	U	0.0017	U	0.0015	U	0.0015	U	0.0018	U
METHYLENE CHLORIDE	NE	56	409		0.0083	U	0.0049	U	0.0069	U	0.0066	U	0.0073	U	0.0076	U	0.0093	U	0.0061	U	0.0054	U	0.0053	U	0.0062	U

Table 4-1
Soil Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC544-IS-0001-070612		OTC544-IS-0002-070612		OTC544-IS-0003-070612		OTC544-IS-0004-070612		OTC544-IS-0005-070612		OTC544-IS-0006-070612		OTC544-IS-0007-070612		OTC544-IS-0008-070612-FD		OTC544-IS-0009-070612		OTC544-IS-0010-070612		OTC544-IS-0011-070612	
				Sample Date	7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12		0 - 2		14 - 16	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																										
STYRENE	NE	6300	7280		0.0047	U	0.0028	U	0.0039	U	0.0037	U	0.0042	U	0.0043	U	0.0052	U	0.0035	U	0.0031	U	0.003	U	0.0035	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0036	U	0.0021	U	0.003	U	0.0029	U	0.0032	U	0.0033	U	0.004	U	0.0027	U	0.0024	U	0.0023	U	0.0027	U
TETRACHLOROETHYLENE	NE	22	7.02		0.0018	U	0.0011	U	0.0015	U	0.0014	U	0.0016	U	0.0017	U	0.002	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
TOLUENE	NE	5000	5270		0.0022	U	0.0013	U	0.0018	U	0.0017	U	0.0019	U	0.002	U	0.0024	U	0.0016	U	0.0014	U	0.0014	U	0.0016	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0027	U	0.0016	U	0.0023	U	0.0021	U	0.0024	U	0.0025	U	0.003	U	0.002	U	0.0018	U	0.0017	U	0.002	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.002	U	0.0012	U	0.0017	U	0.0016	U	0.0018	U	0.0018	U	0.0022	U	0.0015	U	0.0013	U	0.0013	U	0.0015	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0022	U	0.0013	U	0.0018	U	0.0017	U	0.0019	U	0.002	U	0.0024	U	0.0016	U	0.0014	U	0.0014	U	0.0016	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0036	U	0.0021	U	0.003	U	0.0029	U	0.0032	U	0.0033	U	0.004	U	0.0027	U	0.0024	U	0.0023	U	0.0027	U
VINYL CHLORIDE	NE	0.06	0.728		0.0027	U	0.0016	U	0.0023	U	0.0021	U	0.0024	U	0.0025	U	0.003	U	0.002	U	0.0018	U	0.0017	U	0.002	U
XYLENES, TOTAL	NE	630	814		0.0058	UJ	0.0034	U	0.0048	U	0.0046	U	0.0051	U	0.0053	U	0.0065	U	0.0043	U	0.0038	U	0.0037	U	0.0043	U
SEMIVOLATILES (mg/kg)																										
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	UJ	0.02	UJ
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
2,4-DICHLOROPHENOL	NE	180	183		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.026	U	0.025	U	0.026	U	0.025	U	0.025	U	0.025	U	0.027	U	0.026	U	0.024	U	0.026	U	0.025	U
2,4-DINITROPHENOL	NE	120	122		0.42	U	0.4	U	0.41	U	0.4	U	0.4	U	0.4	U	0.42	U	0.42	U	0.38	U	0.42	U	0.4	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
2,6-DINITROTOLUENE	NE	61	61.1		0.025	U	0.024	U	0.024	U	0.024	U	0.024	U	0.024	U	0.025	U	0.025	U	0.023	U	0.025	U	0.024	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
2-CHLOROPHENOL	NE	390	391		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
2-METHYLNAPHTHALENE	NE	230	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
2-METHYLPHENOL	NE	3100	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
2-NITROANILINE	NE	610	NE		0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
2-NITROPHENOL	NE	NE	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
3-NITROANILINE	NE	NE	NE		0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.083	U	0.08	U	0.081	U	0.08	U	0.081	U	0.081	U	0.085	U	0.084	U	0.077	U	0.083	U	0.08	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
4-CHLOROANILINE	NE	2.4	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
4-NITROANILINE	NE	24	NE		0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
4-NITROPHENOL	NE	NE	NE		0.17	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.17	U	0.17	U	0.15	U	0.17	U	0.16	U
ACENAPHTHENE	NE	3400	3440		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
ACENAPHTHYLENE	NE	NE	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
ACETOPHENONE	NE	7800	7820		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
ANTHRACENE	NE	17000	17200		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
ATRAZINE	NE	2.1	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U

Table 4-1
Soil Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC544-IS-0001-070612		OTC544-IS-0002-070612		OTC544-IS-0003-070612		OTC544-IS-0004-070612		OTC544-IS-0005-070612		OTC544-IS-0006-070612		OTC544-IS-0007-070612		OTC544-IS-0008-070612-FD		OTC544-IS-0009-070612		OTC544-IS-0010-070612		OTC544-IS-0011-070612	
				Sample Date	7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12		0 - 2		14 - 16	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																										
BENZALDEHYDE	NE	7800	NE	0.21	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.21	U	0.21	U	0.19	U	0.21	U	0.2	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
BENZO(A)PYRENE	NE	0.015	0.148	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
BIPHENYL	NE	51	57.1	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	**0.144**	J	0.08	U	0.081	U	0.08	U	0.081	U	0.081	U	0.085	U	0.084	U	0.077	U	0.083	U	0.08	U
CAPROLACTAM	NE	31000	NE	0.067	U	0.064	U	0.065	U	0.064	U	0.065	U	0.065	U	0.068	U	0.067	U	0.061	U	0.067	U	0.064	U
CARBAZOLE	NE	NE	NE	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
CHRYSENE	NE	15	148	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
DIBENZOFURAN	NE	78	NE	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
DIETHYL PHTHALATE	NE	49000	48900	0.083	U	0.08	U	0.081	U	0.08	U	0.081	U	0.081	U	0.085	U	0.084	U	0.077	U	0.083	U	0.08	U
DIMETHYL PHTHALATE	NE	611000	611000	0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.083	U	0.08	U	0.081	U	0.08	U	0.081	U	0.081	U	0.085	U	0.084	U	0.077	U	0.083	U	0.08	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
FLUORANTHENE	NE	2300	2290	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
FLUORENE	NE	2300	2290	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.091	U	0.088	U	0.09	U	0.088	U	0.089	U	0.089	U	0.093	U	0.092	U	0.084	U	0.091	UJ	0.088	UJ
HEXACHLOROETHANE	NE	12	42.8	0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
ISOPHORONE	NE	510	5120	0.021	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.021	UJ	0.021	UJ	0.019	UJ	0.021	UJ	0.02	UJ
M,P-CRESOL	NE	NE	NE	0.03	U	0.029	U	0.029	U	0.029	U	0.029	U	0.029	U	0.03	U	0.03	U	0.028	U	0.03	U	0.029	U
NAPHTHALENE	NE	3.6	43.0	0.033	U	0.032	U	0.033	U	0.032	U	0.032	U	0.032	U	0.034	U	0.034	U	0.031	U	0.033	U	0.032	U
NITROBENZENE	NE	4.8	53.5	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.25	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.25	U	0.25	U	0.23	U	0.25	U	0.24	U
PHENANTHRENE	NE	1830	1830	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
PHENOL	NE	18000	18300	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
PYRENE	NE	1700	1720	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U

Table 4-1
Soil Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC544-IS-0001-070612		OTC544-IS-0002-070612		OTC544-IS-0003-070612		OTC544-IS-0004-070612		OTC544-IS-0005-070612		OTC544-IS-0006-070612		OTC544-IS-0007-070612		OTC544-IS-0008-070612-FD		OTC544-IS-0009-070612		OTC544-IS-0010-070612		OTC544-IS-0011-070612	
				Sample Date	7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12		0 - 2		14 - 16	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																										
1,3,5-TRINITROBENZENE	NE	2200.0	NE		0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U
1,3-DINITROBENZENE	NE	6.10	NE		0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U
2,4,6-TRINITROTOLUENE	NE	19.0	39.1		0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U
2,4-DINITROTOLUENE	NE	1.60	15.7		0.078	U	0.089	U	0.084	U	0.094	U	0.082	U	0.084	U	0.091	U	0.089	U	0.089	U	0.082	U	0.069	U
2,6-DINITROTOLUENE	NE	61.0	61.1		0.07	U	0.08	U	0.076	U	0.084	U	0.073	U	0.075	U	0.082	U	0.08	U	0.08	U	0.074	U	0.062	U
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE		0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U
2-NITROTOLUENE	NE	2.90	29.1		0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U
3-NITROTOLUENE	NE	6.10	7.82		0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE		0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U
4-NITROTOLUENE	NE	30.0	244.4		0.081	U	0.093	U	0.088	U	0.098	U	0.085	U	0.087	U	0.095	U	0.093	U	0.093	U	0.086	U	0.072	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2		0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U
NITROBENZENE	NE	4.80	53.5		0.075	U	0.085	U	0.081	U	0.09	U	0.078	U	0.081	U	0.087	U	0.085	U	0.085	U	0.079	U	0.066	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7		0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U
TETRYL	NE	240.0	244.0		0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U
METALS (mg/kg)																										
ALUMINUM	13722	77000	78000		**2460**		**1820**		**5770**		**2070**		**3700**		**2120**		**1290**		**1500**		**979**		**2310**		**7000**	
ANTIMONY	1.6	31	31.3		1.1	U	1.2	U	1.2	U	1.1	U	0.99	U	**3.9**	J	1	U	**3.7**	J	1.2	U	1.1	U	1.1	U
ARSENIC	3.7	0.39	3.90		1.1	U	1.2	U	**1.4**	J	1.1	U	0.99	U	0.77	U	1	U	0.89	U	1.2	U	1.1	U	1.1	U
BARIUM	169.3	15000	15600		**32.2**	J	**19.6**	J	**41.8**	J	**22.4**	J	**42.9**	J	**19**	J	**25.6**	J	**27.8**	J	**13.1**	J	**29.2**	J	**60.7**	J
BERYLLIUM	1.6	160	156		0.55	U	0.6	U	0.6	U	0.57	U	0.49	U	0.39	U	0.51	U	0.44	U	0.58	U	0.53	U	0.57	U
CADMIUM	0.3	70	70.3		0.55	U	0.6	U	0.6	U	0.57	U	0.49	U	0.77	U	0.51	U	0.89	U	0.58	U	0.53	U	0.57	U
CALCIUM	317332	NE	NE		**214000**		**199000**		**218000**		**237000**		**231000**		**239000**		**263000**		**266000**		**166000**		**251000**		**132000**	
CHROMIUM[d]	25	117000	117000		**2.4**	J	**2.6**	J	**6.1**		**3.9**	J	**3.5**	J	**1.7**	J	**0.99**	J	0.89	U	**1**	J	**1.7**	J	**9.7**	
COBALT	7.7	23	NE		**0.83**	J	0.6	U	**1.9**	J	**0.8**	J	**1.2**	J	**0.64**	J	0.51	U	**0.55**	J	**1.5**	J	**0.87**	J	**2.6**	J
COPPER	13	3100	3130		**2**	J	1.2	U	**2.2**	J	**1.5**	J	**1.8**	J	0.77	U	**1.7**	J	**1.8**	J	1.2	U	**2.2**	J	**4.4**	J
IRON	23049	55000	54800		**2160**		**1960**		**5530**		**2280**		**3490**		**2210**		**1050**		**1240**		**1360**		**1870**		**5640**	
LEAD	10.9	400	400		**1.1**	J	**1.3**	J	**3**	J	**1.3**	J	**1.8**	J	**1.2**	J	0.51	U	0.89	U	0.58	U	**0.64**	J	**3.9**	J
MAGNESIUM	16991	NE	NE		**5120**		**1620**	J	**3380**		**1670**	J	**4520**		**1320**	J	**4110**		**4260**		**713**	J	**4330**		**3830**	
MANGANESE	393	1800	1860		**47.1**		**28.3**		**72.7**		**40.4**		**66.5**		**50.9**		**20.4**		**23.3**		**66**		**40.5**		**91.2**	
MERCURY	0.0108	10	15.6		0.0099	U	0.0095	U	0.0098	U	0.0094	U	0.0098	U	0.0092	U	0.0099	U	0.01	U	0.0091	U	0.01	U	0.0094	U
NICKEL	17.4	1500	1560		**1.7**	J	**1.5**	J	**5**	J	**1.9**	J	**2.6**	J	**1.5**	J	**1.2**	J	**1.3**	J	**1.2**	J	**1.7**	J	**6.4**	J
POTASSIUM	5077	NE	NE		**610**	J	**537**	J	**1760**	J	**593**	J	**930**	J	**643**	J	**432**	J	**468**	J	290	U	**614**	J	**1600**	J
SELENIUM	1.4	390	391		2.2	U	2.4	U	2.4	U	2.3	U	2	U	3.1	U	2	U	3.6	U	2.3	U	2.1	U	2.3	U
SILVER	1.1	390	391		0.55	U	0.6	U	0.6	U	0.57	U	0.49	U	0.39	U	0.51	U	0.44	U	0.58	U	0.53	U	0.57	U
SODIUM	5196	NE	NE		600	U	660	U	660	U	630	U	**1240**	J	**482**	J	**1420**	J	**1360**	J	630	U	**1070**	J	630	U
THALLIUM	1.3	0.78	0.782		1.4	U	1.6	U	1.6	U	1.5	U	1.3	U	2	U	1.3	U	2.3	U	1.5	U	1.4	U	1.5	U
VANADIUM	42.6	390	391		**6.4**	J	**3.9**	J	**9.6**	J	**4.4**	J	**8.7**	J	**5.7**	J	**3.8**	J	**4.1**	J	**4**	J	**4.9**	J	**12.3**	J
ZINC	54.6	23000	23500		**5**	J	**4.6**	J	**13.9**		**4.4**	J	**7.5**	J	**4**	J	2.6	U	4.4	U	2.9	U	**5.3**	J	**19.7**	

Table 4-1
Soil Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC544-IS-0001-070612		OTC544-IS-0002-070612		OTC544-IS-0003-070612		OTC544-IS-0004-070612		OTC544-IS-0005-070612		OTC544-IS-0006-070612		OTC544-IS-0007-070612		OTC544-IS-0008-070612-FD		OTC544-IS-0009-070612		OTC544-IS-0010-070612		OTC544-IS-0011-070612	
				Sample Date	7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12		0 - 2		14 - 16	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																										
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93		0.0083	U	0.0081	U	0.0082	U	0.008	U	0.0081	U	0.0081	U	0.0085	U	0.0086	U	0.0076	U	0.0083	U	0.008	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U	0.011	U	0.0095	U	0.01	U	0.01	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U	0.011	U	0.0095	U	0.01	U	0.01	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22		0.0083	U	0.0081	U	0.0082	U	0.008	U	0.0081	U	0.0081	U	0.0085	U	0.0086	U	0.0076	U	0.0083	U	0.008	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22		0.0083	U	0.0081	U	0.0082	U	0.008	U	0.0081	U	0.0081	U	0.0085	U	0.0086	U	0.0076	U	0.0083	U	0.008	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12		0.0083	U	0.0081	U	0.0082	U	0.008	U	0.0081	U	0.0081	U	0.0085	U	0.0086	U	0.0076	U	0.0083	U	0.008	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22		0.0083	U	0.0081	U	0.0082	U	0.008	U	0.0081	U	0.0081	U	0.0085	U	0.0086	U	0.0076	U	0.0083	U	0.008	U
PETROLEUM HYDROCARBONS (mg/kg)																										
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000		5.5	U	4.4	U	2.9	U	4.9	U	5.8	U	4.5	U	6.6	U	6.2	U	4.1	U	3.7	U	4.9	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000		4.2	U	**5.41**	J	**7.1**	J	4.1	U	4.1	U	**8.12**	J	4.3	U	4.2	U	**5.73**	J	4.1	U	4	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000		4.2	U	4	U	4.1	U	4.1	U	4.1	U	4	U	4.3	U	4.2	U	3.8	U	4.1	U	4	U
CYANIDE (mg/kg)																										
CYANIDE	NE	22.0	46.9		0.072	U	0.072	U	0.072	U	0.072	U	0.072	U	0.073	U	0.076	U	0.075	U	0.068	U	0.073	U	0.07	U
TRITIUM (pCi/g)																										
TRITIUM	NE	NE	NE		5.13	U	4.91	U	5.05	U	5.29	U	5.14	U	5.01	U	5.03	U	4.79	U	5.21	U	4.89	U	5.04	U

Table 4-1
Soil Analytical Data
Buidling 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

Table 4-2
Groundwater Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NMWQCC WQS (µg/L)[c]	Sample Number: OTC544-GW-5441-090412	
				Sample date: 9/4/2012	
				Location: MW-01	
				Result	VQ
TOTAL DISSOLVED SOLIDS (mg/L)	NE	NE	10,000	**5020**	
VOLATILES (µg/L)					
1,1,1-TRICHLOROETHANE	NE	200	60	0.2	U
1,1,2,2-TETRACHLOROETHANE	NE	NE	10	0.23	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	NE	NE	0.47	U
1,1,2-TRICHLOROETHANE	NE	5	10	0.22	U
1,1-DICHLOROETHANE	NE	NE	25	0.25	U
1,1-DICHLOROETHENE	NE	7	5	0.23	U
1,2,4-TRICHLOROBENZENE	NE	70	NE	0.5	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.2	NE	0.5	U
1,2-DIBROMOETHANE	NE	0.05	0.10	0.37	U
1,2-DICHLOROBENZENE	NE	600	NE	**0.25**	J
1,2-DICHLOROETHANE	NE	5	10	0.2	U
1,2-DICHLOROPROPANE	NE	5	NE	0.25	U
1,3-DICHLOROBENZENE	NE	NE	NE	0.2	U
1,4-DICHLOROBENZENE	NE	75	NE	0.23	U
2-HEXANONE	NE	NE	NE	4	U
ACETONE	NE	NE	NE	10	U
BENZENE	NE	5	10	0.2	U
BROMODICHLOROMETHANE	NE	80	NE	0.2	U
BROMOFORM	NE	80	NE	0.2	U
BROMOMETHANE	NE	NE	NE	0.5	U
CARBON DISULFIDE	NE	NE	NE	0.5	U
CARBON TETRACHLORIDE	NE	5	10	0.25	U
CHLOROBENZENE	NE	100	NE	0.2	U
CHLOROETHANE	NE	NE	NE	0.5	U
CHLOROFORM	NE	80	100	**0.32**	J

Table 4-2
Groundwater Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC544-GW-5441-090412	
			Sample date	9/4/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NMWQCC WQS (µg/L)[c]**	Result	VQ
VOLATILES - continued (µg/L)					
CHLOROMETHANE	NE	NE	NE	0.5	U
CIS-1,2-DICHLOROETHYLENE	NE	70	NE	0.26	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE	0.2	U
CYCLOHEXANE	NE	NE	NE	0.31	U
DIBROMOCHLOROMETHANE	NE	80	NE	0.2	U
DICHLORODIFLUOROMETHANE	NE	NE	NE	0.5	U
ETHYLBENZENE	NE	700	750	0.2	U
ISOPROPYLBENZENE	NE	NE	NE	0.2	U
METHYL ACETATE	NE	NE	NE	5	U
METHYL ETHYL KETONE	NE	NE	NE	2	U
METHYL ISOBUTYL KETONE	NE	NE	NE	2	U
METHYLCYCLOHEXANE	NE	NE	NE	0.38	U
METHYLENE CHLORIDE	NE	5	100	2	U
STYRENE	NE	100	NE	0.2	U
TERT-BUTYL METHYL ETHER	NE	NE	NE	0.34	U
TETRACHLOROETHYLENE	NE	5	20	**3.9**	
TOLUENE	NE	1000	750	0.2	U
TRANS-1,2-DICHLOROETHENE	NE	100	NE	0.35	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	0.2	U
TRICHLOROETHYLENE	NE	5	100	**1**	
TRICHLOROFLUOROMETHANE	NE	NE	NE	0.5	U
VINYL CHLORIDE	NE	2	1	0.22	U
XYLENES, TOTAL	NE	10000	620	0.52	U

Table 4-2
Groundwater Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC544-GW-5441-090412	
			Sample date	9/4/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NMWQCC WQS (µg/L)[c]	Result	VQ
SEMIVOLATILES (µg/L)					
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	0.52	U
2,4,5-TRICHLOROPHENOL	NE	NE	NE	0.48	U
2,4,6-TRICHLOROPHENOL	NE	NE	NE	0.48	U
2,4-DICHLOROPHENOL	NE	NE	NE	0.48	U
2,4-DIMETHYLPHENOL	NE	NE	NE	1.1	U
2,4-DINITROPHENOL	NE	NE	NE	9.6	UJ
2,4-DINITROTOLUENE	NE	NE	NE	0.48	U
2,6-DINITROTOLUENE	NE	NE	NE	0.48	U
2-CHLORONAPHTHALENE	NE	NE	30	0.48	U
2-CHLOROPHENOL	NE	NE	NE	0.48	U
2-METHYLNAPHTHALENE	NE	NE	30	0.55	U
2-METHYLPHENOL (O-CRESOL)	NE	NE	NE	0.52	U
2-NITROANILINE	NE	NE	NE	0.48	U
2-NITROPHENOL	NE	NE	NE	0.52	U
3,3'-DICHLOROBENZIDINE	NE	NE	NE	0.96	U
3-NITROANILINE	NE	NE	NE	0.48	U
4,6-DINITRO-2-METHYLPHENOL	NE	NE	NE	1.9	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	0.48	U
4-CHLORO-3-METHYLPHENOL	NE	NE	NE	0.48	U
4-CHLOROANILINE	NE	NE	NE	0.48	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	0.48	U
4-NITROANILINE	NE	NE	NE	0.48	U
4-NITROPHENOL	NE	NE	NE	4.8	UJ
ACENAPHTHENE	NE	NE	30	0.48	U
ACENAPHTHYLENE	NE	NE	30	0.48	U
ACETOPHENONE	NE	NE	NE	0.49	U
ANTHRACENE	NE	NE	30	0.48	U

Table 4-2
Groundwater Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC544-GW-5441-090412	
			Sample date	9/4/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NMWQCC WQS (µg/L)[c]	Result	VQ
SEMIVOLATILES - continued (µg/L)					
ATRAZINE	NE	3	NE	0.65	U
BENZALDEHYDE	NE	NE	NE	4.8	U
BENZO(A)ANTHRACENE	NE	NE	30	0.48	U
BENZO(A)PYRENE	NE	0.2	0.7	0.48	U
BENZO(B)FLUORANTHENE	NE	NE	30	0.48	U
BENZO(G,H,I)PERYLENE	NE	NE	30	0.48	U
BENZO(K)FLUORANTHENE	NE	NE	30	0.48	U
BENZYL BUTYL PHTHALATE	NE	NE	NE	1.1	U
BIPHENYL	NE	NE	NE	0.48	U
BIS(2-CHLOROETHOXY) METHANE	NE	NE	NE	0.48	U
BIS(2-CHLOROETHYL) ETHER	NE	NE	NE	0.52	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	6	NE	1.1	U
CAPROLACTAM	NE	NE	NE	3.8	U
CARBAZOLE	NE	NE	NE	0.48	U
CHRYSENE	NE	NE	30	0.48	U
DIBENZ(A,H)ANTHRACENE	NE	NE	30	0.5	U
DIBENZOFURAN	NE	NE	NE	0.48	U
DIETHYL PHTHALATE	NE	NE	NE	1.1	U
DIMETHYL PHTHALATE	NE	NE	NE	0.95	U
DI-N-BUTYL PHTHALATE	NE	NE	NE	0.84	U
DI-N-OCTYLPHTHALATE	NE	NE	NE	1.1	U
FLUORANTHENE	NE	NE	30	0.48	U
FLUORENE	NE	NE	30	0.48	U
HEXACHLOROBENZENE	NE	1	NE	0.54	U
HEXACHLOROBUTADIENE	NE	NE	NE	0.96	U
HEXACHLOROCYCLOPENTADIENE	NE	50	NE	1.8	UJ
HEXACHLOROETHANE	NE	NE	NE	0.96	U

Table 4-2
Groundwater Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC544-GW-5441-090412	
			Sample date	9/4/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NMWQCC WQS (µg/L)[c]	Result	VQ
SEMIVOLATILES - continued (µg/L)					
INDENO(1,2,3-C,D)PYRENE	NE	NE	30	0.48	U
ISOPHORONE	NE	NE	NE	0.48	U
M,P-CRESOL	NE	NE	NE	1.1	U
NAPHTHALENE	NE	NE	30	0.77	U
NITROBENZENE	NE	NE	NE	**18.5**[e]	
N-NITROSODI-N-PROPYLAMINE	NE	NE	NE	0.48	U
N-NITROSODIPHENYLAMINE	NE	NE	NE	0.96	U
PENTACHLOROPHENOL	NE	1	NE	5.2	U
PHENANTHRENE	NE	NE	30	0.48	U
PHENOL	NE	NE	NE	0.48	U
PYRENE	NE	NE	30	0.48	U
EXPLOSIVES (µg/L)					
1,3,5-TRINITROBENZENE	NE	NE	NE	0.076	U
1,3-DINITROBENZENE	NE	NE	NE	0.092	U
2,4,6-TRINITROTOLUENE	NE	NE	NE	0.076	U
2,4-DINITROTOLUENE	NE	NE	NE	0.076	U
2,6-DINITROTOLUENE	NE	NE	NE	0.076	U
2-AMINO-4,6-DINITROTOLUENE	NE	NE	NE	0.076	U
2-NITROTOLUENE	NE	NE	NE	0.076	U
3-NITROTOLUENE	NE	NE	NE	0.076	U
4-AMINO-2,6-DINITROTOLUENE	NE	NE	NE	0.078	U
4-NITROTOLUENE	NE	NE	NE	0.076	U
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	NE	NE	0.076	U
NITROBENZENE	NE	NE	NE	0.08	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	NE	NE	0.076	U
TETRYL	NE	NE	NE	0.076	U

Table 4-2
Groundwater Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	OTC544-GW-5441-090412	
			Sample date	9/4/2012	
			Location	MW-01	
	Background Values - Unfiltered GW (µg/L)[a]	**EPA MCL (µg/L)[b]**	**NMWQCC WQS (µg/L)[c]**	Result	VQ
METALS (µg/L)					
ALUMINUM	1043	NE	NE	**44.4**	J
ANTIMONY	6	6	NE	2	U
ARSENIC	10	10	100	2	U
BARIUM	38	2000	1000	**12.9**	J
BERYLLIUM	4	4	NE	1	U
CADMIUM	5	5	10	1	U
CALCIUM	1,136,664	NE	NE	**493,000**	
CHROMIUM, TOTAL	12	100	50	**11.1**	
COBALT	36	NE	NE	1	U
COPPER	9.8	1300	1000	2	U
IRON	300	NE	1000	35	U
LEAD	9	15	50	1	U
MAGNESIUM	3,692,782	NE	NE	**231,000**	
MANGANESE	50	NE	200	**6**	J
MERCURY	0.5	2	2	0.078	U
NICKEL	22	NE	NE	2	U
POTASSIUM	212,144	NE	NE	**20000**	
SELENIUM	50	50	50	**4.3**	J
SILVER	10	NE	50	1	U
SODIUM	20,989,580	NE	NE	**543,000**	
THALLIUM	2	2	NE	1.9	U
VANADIUM	90	NE	NE	**25.6**	J
ZINC	17	NE	10000	5	U

Table 4-2
Groundwater Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Unfiltered GW (µg/L)[a]	EPA MCL (µg/L)[b]	NMWQCC WQS (µg/L)[c]	Sample Number: OTC544-GW-5441-090412	
				Sample date: 9/4/2012	
				Location: MW-01	
				Result	VQ
PCBs (µg/L)					
PCB-1016 (AROCHLOR 1016)	NE	NE	1	0.19	U
PCB-1221 (AROCHLOR 1221)	NE	NE	1	0.24	U
PCB-1232 (AROCHLOR 1232)	NE	NE	1	0.24	U
PCB-1242 (AROCHLOR 1242)	NE	NE	1	0.19	U
PCB-1248 (AROCHLOR 1248)	NE	NE	1	0.19	U
PCB-1254 (AROCHLOR 1254)	NE	NE	1	0.19	U
PCB-1260 (AROCHLOR 1260)	NE	NE	1	0.19	U
PETROLEUM HYDROCARBONS (µg/L) [d]					
GASOLINE RANGE ORGANICS C6-C10	NE	NE	See individual VOC & SVOC	50	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	400	96	U
OIL RANGE ORGANICS C28-C40	NE	NE	200	96	U
CYANIDE (µg/L)					
CYANIDE	NE	200	200	5	U
TRITIUM (pCi/L)					
TRITIUM	NE	NE	NE	290	U

Table 4-2
Groundwater Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Value exceeds NM WQCC Water Quality Standard

Value exceeds EPA Maximum Contaminant Level

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," letter to D. Scruggs, Chief, Environmental Restoration Program, Holloman Air Force Base from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, New Mexico Environment Department, March 1.*

[b] *U.S. Environmental Protection Agency (EPA), 2012, National Primary Drinking Water Regulations: List of Drinking Water Contaminants and Maximum Contaminant Levels.*

[c] *New Mexico Water Quality Control Commission, Water Quality Standards, 20.6.2 New Mexico Administrative Code.*

[d]New Mexico Environment Department (NMED), 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, New Mexico Environment Department, Santa Fe, New Mexico, February, Table 6-2. TPH Screening Guidelines for Potable Groundwater (GW-1), February 2012, Table A-1: NMED Soil Screening Levels, updated June 2012. "Unknown oil" criteria used for Oil Range Oraganics.

[e]Reported concentration is due to laboratory batch extraction cross contamination.

EPA = U.S. Environmental Protection Agency
GW = groundwater
J = estimated value
MCL = Maximum Contaminant Level
µg/L = micrograms per liter
mg/L = milligrams per liter
NA = not analyzed
NE = not established
NMED = New Mexico Environment Department
NM WQCC= New Mexico Water Quality Control Commission
pCi/L = picocuries per liter
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
SVOC = semivolatile organic compound
U = not detected at the detection limit shown
VOC = volatile organic compound
VQ = validation qualifier
WQS = Water Quality Standard

Table 4-3
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	LDY-IDW01-090412	
		Sample Date	9/4/2012	
		Sample Type	Waste	
		40 CFR 261 Waste Characteristic Criteria	Result	Lab Qual
General Chemistry				
Corrosivity as pH	pH Units	> 2 and < 12.5	**7.7**	
Cyanide Reactivity	mg/kg	< 250	1.5	U
Ignitability (Flashpoint)	°F	> 140 °F	>200	
Solids, Percent	%	-	**84.4**	
Sulfide Reactivity	mg/kg	< 500	59	U
TCLP Volatiles				
Benzene	mg/L	0.5	0.0020	U
Chlorobenzene	mg/L	100	0.0020	U
Chloroform	mg/L	6	0.0022	U
Carbon tetrachloride	mg/L	0.5	0.0025	U
1,1-Dichloroethylene	mg/L	0.7	0.0023	U
1,2-Dichloroethane	mg/L	0.5	0.0020	U
p-Dichlorobenzene	mg/L	7.5	0.0023	U
Methyl ethyl ketone	mg/L	200	0.0020	U
Tetrachloroethylene	mg/L	0.7	0.0025	U
Trichloroethylene	mg/L	0.5	0.0026	U
Vinyl chloride	mg/L	0.2	0.0022	U
TCLP Semivolatiles				
2-Methylphenol	mg/L	200	0.0054	U
3&4-Methylphenol	mg/L	200	0.011	U
Pentachlorophenol	mg/L	100	0.054	U
2,4,5-Trichlorophenol	mg/L	400	0.0050	U
2,4,6-Trichlorophenol	mg/L	2	0.0050	U
1,4-Dichlorobenzene	mg/L	7.5	0.010	U
2,4-Dinitrotoluene	mg/L	0.13	0.0050	U
Hexachlorobenzene	mg/L	0.13	0.0056	U
Hexachlorobutadiene	mg/L	0.5	0.010	U
Hexachloroethane	mg/L	3	0.010	U
Nitrobenzene	mg/L	2	0.0059	U
Pyridine	mg/L	100	0.016	U
TCLP Metals				
Arsenic	mg/L	5	0.020	U
Barium	mg/L	100	**0.12**	J
Cadmium	mg/L	1	0.010	U
Chromium	mg/L	5	0.010	U
Lead	mg/L	5	0.010	U
Mercury	mg/L	0.2	0.00050	U
Selenium	mg/L	1	0.020	U
Silver	mg/L	5	0.010	U

Table 4-3
Investigation-Derived Waste
Soil Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

°F = degrees Fahrenheit
> = greater than
< = less than
% = percent
CFR = Code of Federal Regulations
J = estimated value
Lab Qual = laboratory qualifier
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
TCLP = Toxicity Characteristic Leaching Procedure
U = not detected at the detection limit shown

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles				
Acetone	µg/L	NE	10	U
Benzene	µg/L	5	0.21	U
Bromodichloromethane	µg/L	80	0.20	U
Bromoform	µg/L	80	0.34	U
Chlorobenzene	µg/L	100	0.20	U
Chloroethane	µg/L	NE	0.50	U
Chloroform	µg/L	80	0.26	U
Carbon disulfide	µg/L	NE	0.49	U
Carbon tetrachloride	µg/L	5	0.31	U
Cyclohexane	µg/L	NE	0.48	U
1,1-Dichloroethane	µg/L	NE	0.21	U
1,1-Dichloroethylene	µg/L	7	0.20	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	0.71	U
1,2-Dibromoethane	µg/L	0.05	0.30	U
1,2-Dichloroethane	µg/L	5	0.22	U
1,2-Dichloropropane	µg/L	5	0.26	U
Dibromochloromethane	µg/L	80	0.20	U
Dichlorodifluoromethane	µg/L	NE	0.50	U
cis-1,2-Dichloroethylene	µg/L	70	**0.42**	J
cis-1,3-Dichloropropene	µg/L	NE	0.22	U
m-Dichlorobenzene	µg/L	NE	0.25	U
o-Dichlorobenzene	µg/L	600	0.22	U
p-Dichlorobenzene	µg/L	75	0.20	U
trans-1,2-Dichloroethylene	µg/L	100	0.23	U
trans-1,3-Dichloropropene	µg/L	NE	0.21	U
Ethylbenzene	µg/L	700	0.29	U
Freon 113	µg/L	NE	0.33	U
2-Hexanone	µg/L	NE	2.0	U
Isopropylbenzene	µg/L	NE	0.20	U
4-Methyl-2-pentanone	µg/L	NE	2.3	U
Methyl Acetate	µg/L	NE	5.0	U
Methyl bromide	µg/L	NE	0.79	U
Methyl chloride	µg/L	NE	0.50	U
Methylcyclohexane	µg/L	NE	0.20	U
Methylene chloride	µg/L	5	2.0	U
Methyl ethyl ketone	µg/L	NE	3.1	U
Methyl Tert Butyl Ether	µg/L	NE	0.21	U
Styrene	µg/L	100	0.20	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Volatiles (continued)				
1,1,1-Trichloroethane	µg/L	200	0.20	U
1,1,2,2-Tetrachloroethane	µg/L	NE	0.24	U
1,1,2-Trichloroethane	µg/L	5	0.20	U
1,2,4-Trichlorobenzene	µg/L	70	0.50	U
Tetrachloroethylene	µg/L	5	0.32	U
Toluene	µg/L	1000	0.20	U
Trichloroethylene	µg/L	5	0.31	U
Trichlorofluoromethane	µg/L	NE	0.50	U
Vinyl chloride	µg/L	2	0.44	U
Xylene (total)	µg/L	10000	0.50	U
Semivolatiles				
2-Chlorophenol	µg/L	NE	0.68	U
4-Chloro-3-methyl phenol	µg/L	NE	0.78	U
2,4-Dichlorophenol	µg/L	NE	0.67	U
2,4-Dimethylphenol	µg/L	NE	0.74	U
2,4-Dinitrophenol	µg/L	NE	5.0	U
4,6-Dinitro-o-cresol	µg/L	NE	1.4	U
2-Methylphenol	µg/L	NE	0.69	U
3&4-Methylphenol	µg/L	NE	1.3	U
2-Nitrophenol	µg/L	NE	0.65	U
4-Nitrophenol	µg/L	NE	4.8	U
Pentachlorophenol	µg/L	1	4.8	U
Phenol	µg/L	NE	0.53	U
2,4,5-Trichlorophenol	µg/L	NE	0.86	U
2,4,6-Trichlorophenol	µg/L	NE	0.75	U
Acenaphthene	µg/L	NE	0.67	U
Acenaphthylene	µg/L	NE	0.67	U
Acetophenone	µg/L	NE	0.72	U
Anthracene	µg/L	NE	0.72	U
Atrazine	µg/L	3	0.83	U
Benzaldehyde	µg/L	NE	4.8	U
Benzo(a)anthracene	µg/L	NE	0.52	U
Benzo(a)pyrene	µg/L	0.2	0.55	U
Benzo(b)fluoranthene	µg/L	NE	0.73	U
Benzo(g,h,i)perylene	µg/L	NE	0.64	U
Benzo(k)fluoranthene	µg/L	NE	0.64	U
4-Bromophenyl phenyl ether	µg/L	NE	0.76	U
Butyl benzyl phthalate	µg/L	NE	0.68	U
1,1'-Biphenyl	µg/L	NE	0.92	U
2-Chloronaphthalene	µg/L	NE	0.70	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Semivolatiles (continued)				
4-Chloroaniline	µg/L	NE	0.66	U
Caprolactam	µg/L	NE	2.4	U
Carbazole	µg/L	NE	0.50	U
Chrysene	µg/L	NE	0.56	U
bis(2-Chloroethoxy)methane	µg/L	NE	0.67	U
bis(2-Chloroethyl)ether	µg/L	NE	0.69	U
bis(2-Chloroisopropyl)ether	µg/L	NE	0.76	U
4-Chlorophenyl phenyl ether	µg/L	NE	0.84	U
2,4-Dinitrotoluene	µg/L	NE	0.66	U
2,6-Dinitrotoluene	µg/L	NE	0.77	U
3,3'-Dichlorobenzidine	µg/L	NE	0.71	U
Dibenzo(a,h)anthracene	µg/L	NE	0.56	U
Dibenzofuran	µg/L	NE	0.72	U
Di-n-butyl phthalate	µg/L	NE	0.96	U
Di-n-octyl phthalate	µg/L	NE	0.96	U
Diethyl phthalate	µg/L	NE	0.96	U
Dimethyl phthalate	µg/L	NE	0.77	U
bis(2-Ethylhexyl)phthalate	µg/L	6	1.1	U
Fluoranthene	µg/L	NE	0.56	U
Fluorene	µg/L	NE	0.73	U
Hexachlorobenzene	µg/L	1	0.66	U
Hexachlorobutadiene	µg/L	NE	0.92	U
Hexachlorocyclopentadiene	µg/L	50	0.76	U
Hexachloroethane	µg/L	NE	0.71	U
Indeno(1,2,3-cd)pyrene	µg/L	NE	0.55	U
Isophorone	µg/L	NE	0.61	U
2-Methylnaphthalene	µg/L	NE	0.66	U
2-Nitroaniline	µg/L	NE	0.72	U
3-Nitroaniline	µg/L	NE	0.62	U
4-Nitroaniline	µg/L	NE	0.93	U
Naphthalene	µg/L	NE	0.61	U
Nitrobenzene	µg/L	NE	0.69	U
N-Nitroso-di-n-propylamine	µg/L	NE	0.82	U
N-Nitrosodiphenylamine	µg/L	NE	0.96	U
Phenanthrene	µg/L	NE	0.68	U
Pyrene	µg/L	NE	0.65	U
Petroleum Hydrocarbons				
Gasoline Range Organics (C6-C10)	mg/L	NE	0.05	U
Diesel Range Organics (C10-C28)	mg/L	NE	**0.115**	J
Oil Range Organics (C28-C40)	mg/L	NE	0.10	U

Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Analyte	Units	Sample Number	HAFB-IDW-Bulk Waste-0001-111612	
		Sample Date	11/16/2012	
		Sample Type	Water	
		EPA RSL Water (MCL)[a]	Result	VQ
Metals				
Aluminum	µg/L	NE	**36.2**	J
Antimony	µg/L	6	**6.7**	J
Arsenic	µg/L	10	2.5	U
Barium	µg/L	2000	**29.1**	J
Beryllium	µg/L	4	0.50	U
Cadmium	µg/L	5	1.0	U
Calcium	µg/L	NE	**654,000**	
Chromium	µg/L	100	4	U
Cobalt	µg/L	NE	**6.2**	J
Copper	µg/L	1300	**2.9**	J
Iron	µg/L	NE	**97.5**	J
Lead	µg/L	15	2.2	U
Magnesium	µg/L	NE	**310,000**	
Manganese	µg/L	NE	**179**	
Mercury	µg/L	2	0.03	U
Nickel	µg/L	NE	**3.7**	J
Potassium	µg/L	NE	**16,500**	
Selenium	µg/L	50	4.0	U
Silver	µg/L	NE	0.50	U
Sodium	µg/L	NE	**762,000**	
Thallium	µg/L	2	0.078	U
Vanadium	µg/L	NE	**4.5**	J
Zinc	µg/L	NE	**12.8**	J

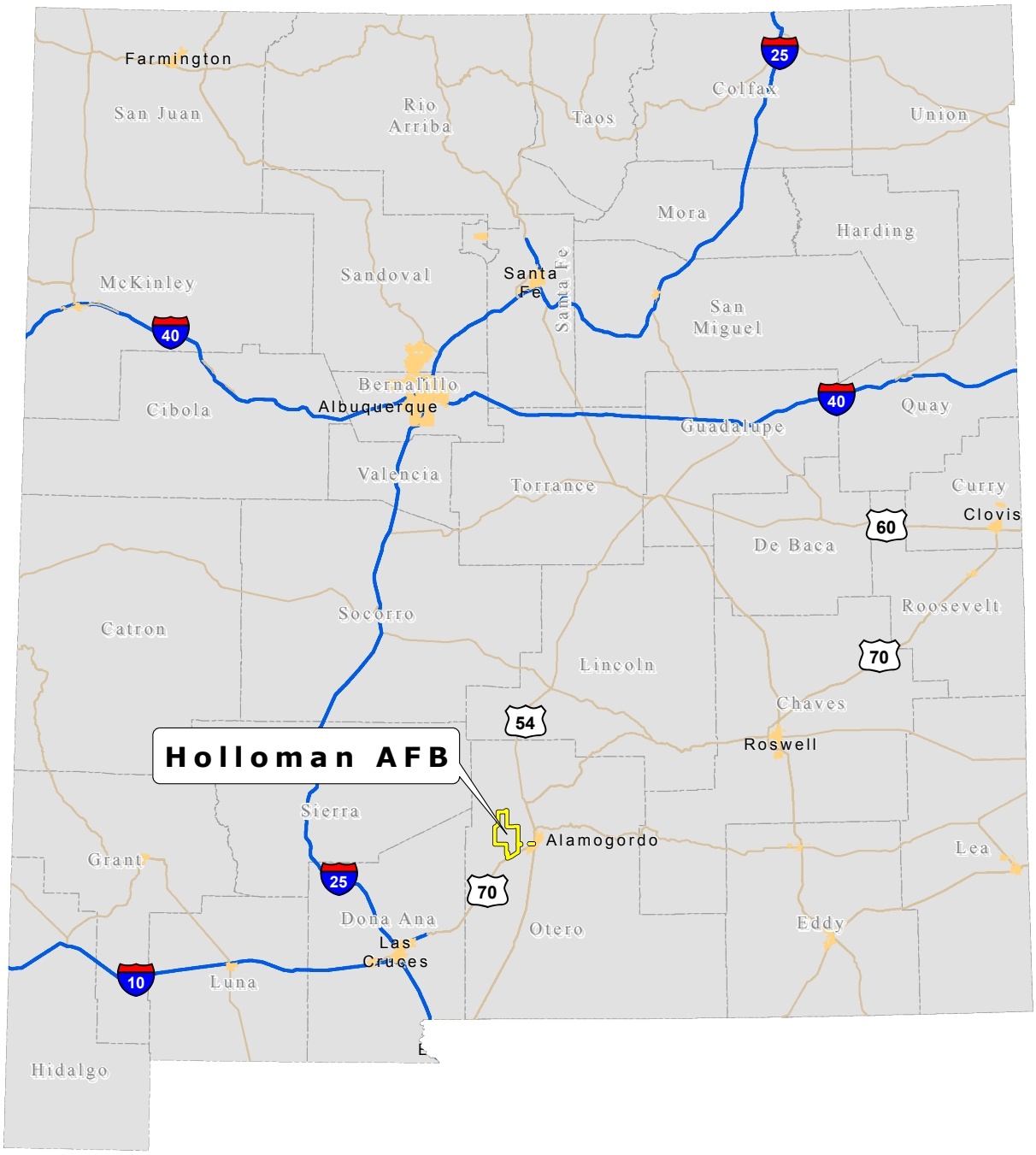
Table 4-4
Investigation-Derived Waste
Water Analytical Data
Holloman Air Force Base, New Mexico

Bold = parameter detected.

[a] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

EPA = U.S. Environmental Protection Agency.
J = estimated value.
MCL = maximum contaminant level.
NE = not established
µg/L = micrograms per liter.
mg/L = milligrams per liter.
RSL = regional screening level.
U = not detected at the detection limit shown.
VQ = validation qualifier.

Figures



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Date: 8/28/2013

Approved By: BFoss

Checked By: CLong

Drawn By: BGrod

Office: Hou

Legend

Holloman AFB

N

WGS 84 UTM Zone 13N Meters

0 20 40 80
Kilometers

0 10 20 40
Miles

Figure 1-1

Holloman Air Force Base Location

Holloman AFB, New Mexico

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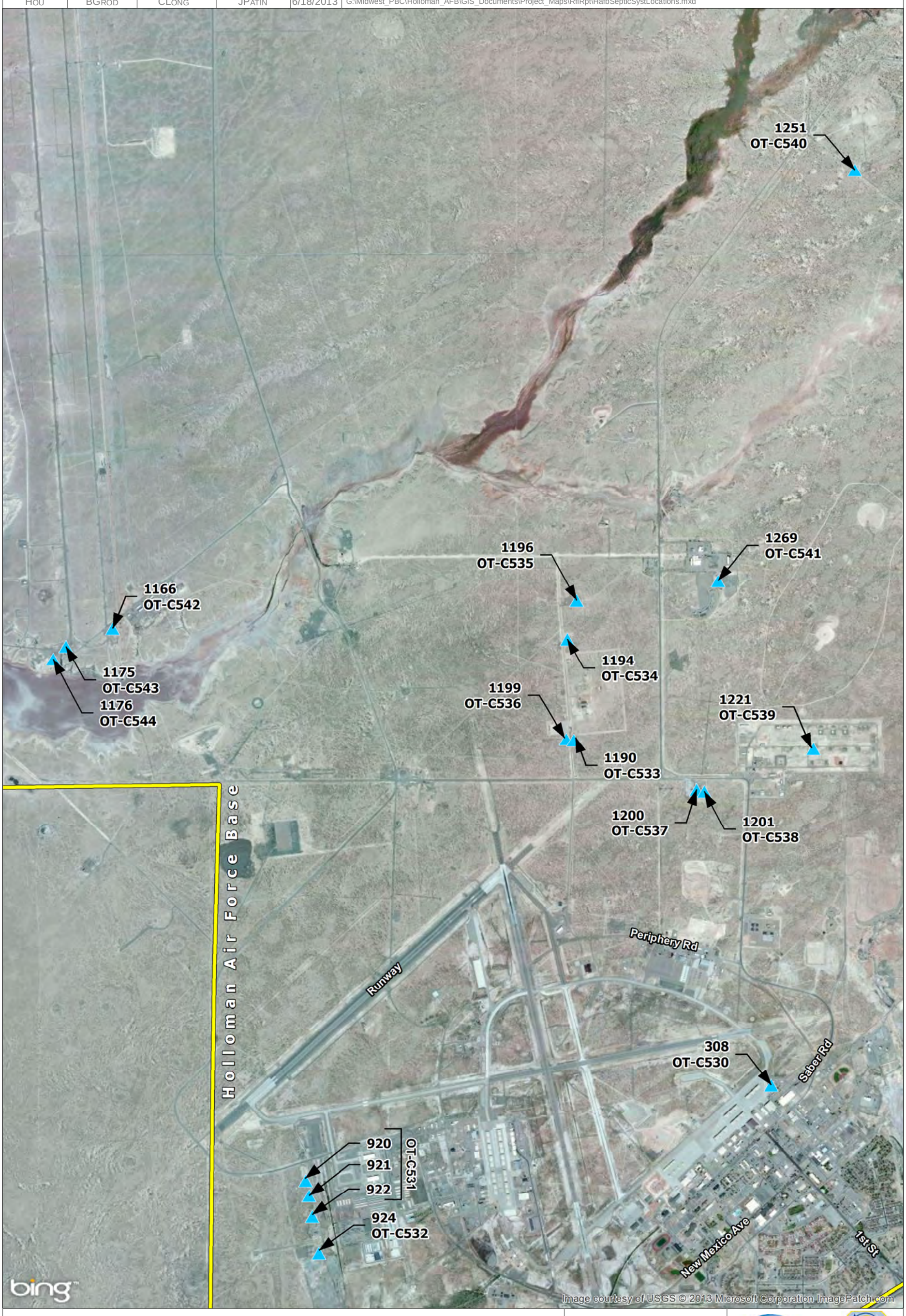


LEGEND

- Holloman AFB
- Septic Tank System

N

WGS 84 UTM Zone 13N
Meters

1 inch = 2,800 feet

0 700 1,400 2,800
Feet

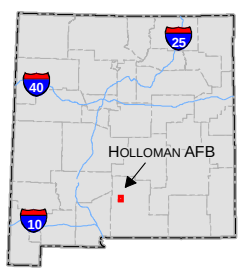
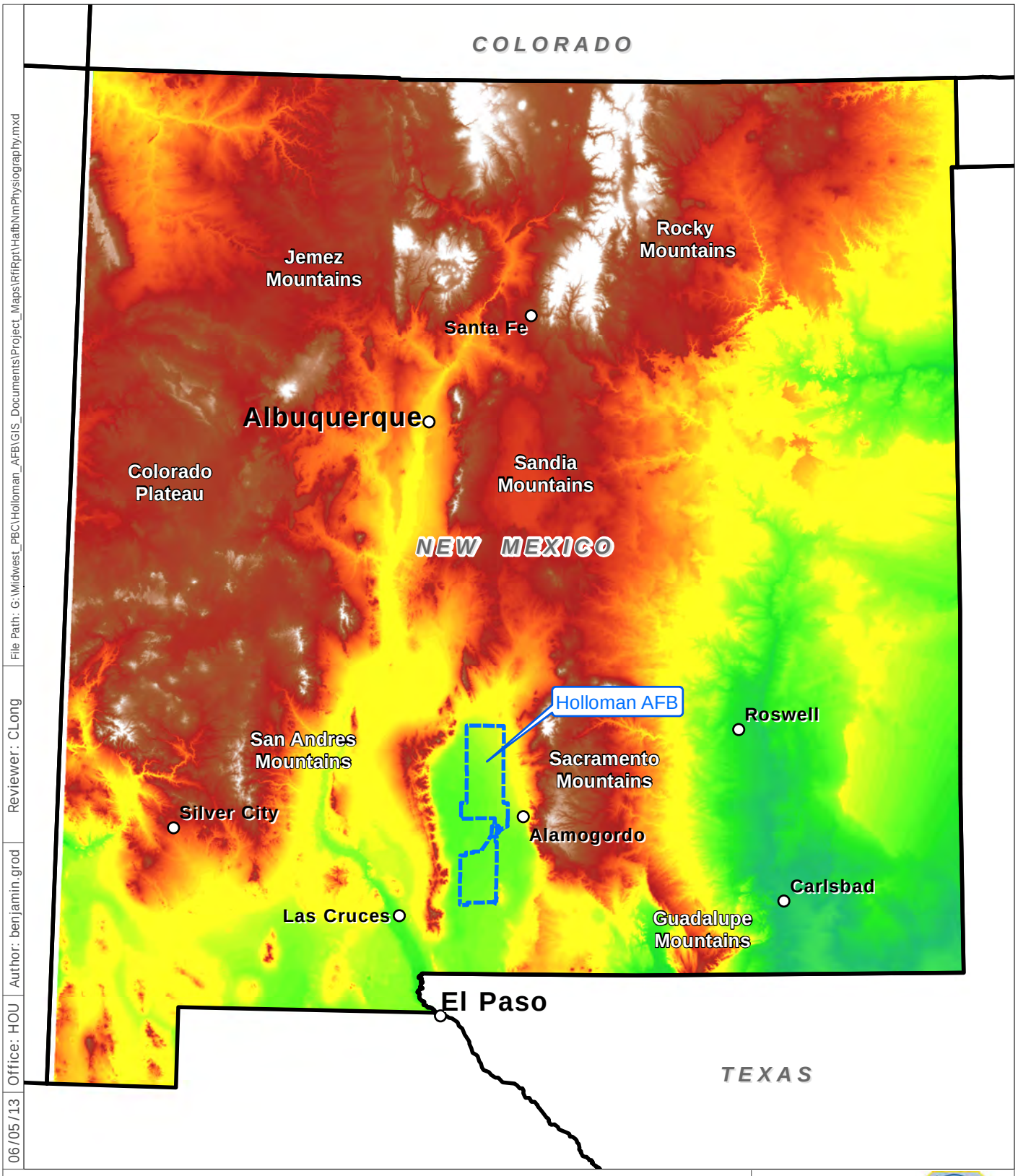


Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
Holloman AFB, NM



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Reviewer: CLong
Author: benjamin.grod
Office: HOU
06/05/13

Legend

Holloman Air Force Base (AFB) Installation Area

Elevation
- High : 3,936 meters
- Low : 0 meters

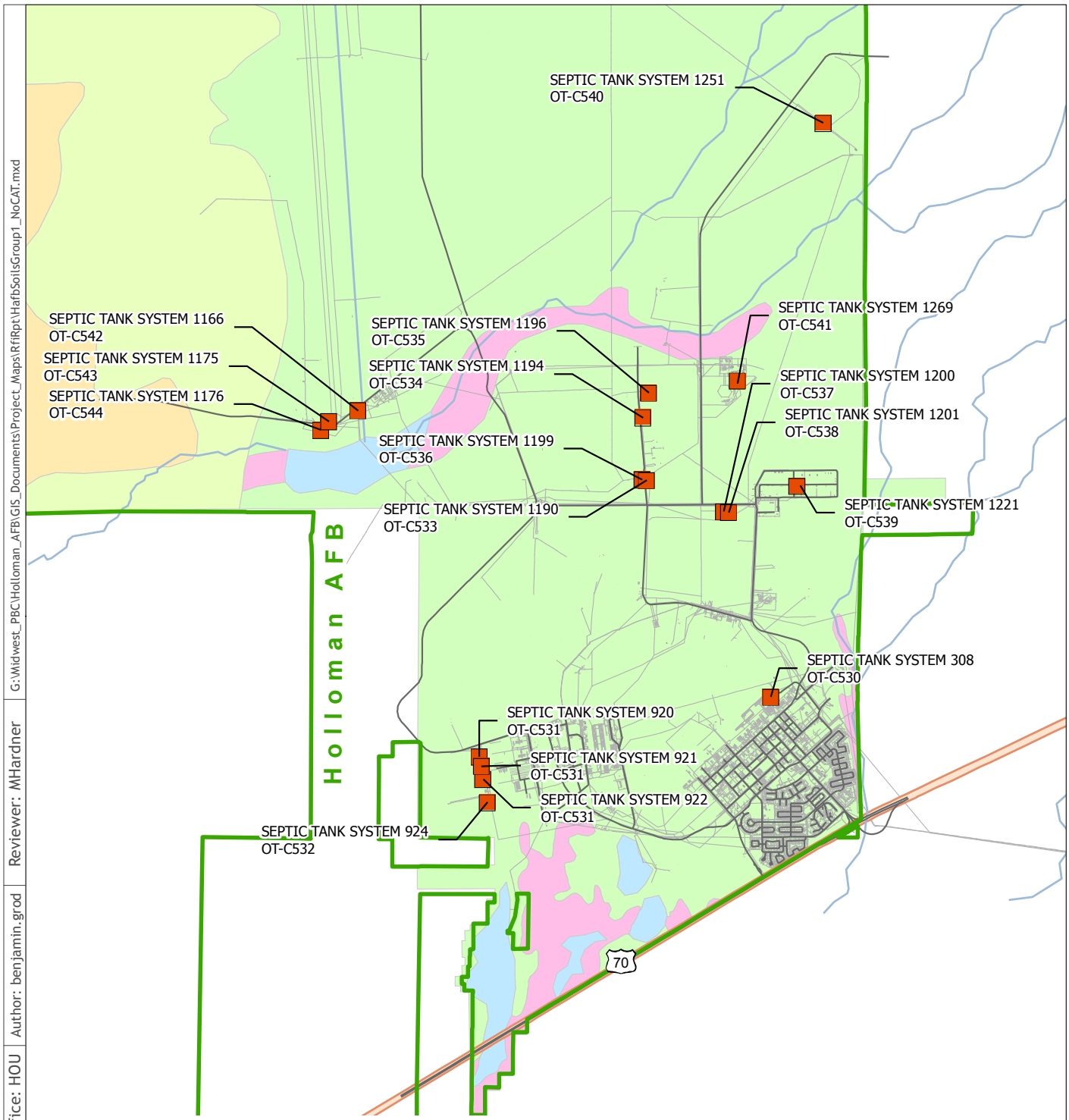
NAD 83 SPCS
New Mexico Central
Feet

0 50
Miles

Figure 2-1

Physiographic Map

Holloman AFB, New Mexico



Note:
1) Soils types at Holloman Air Force Base, New Mexico are based on United States Department of Agriculture (USDA) Soil Conservation Service Classifications. Source USDA, 1981

06/18/13 | Office: HOU | Author: benjamin.grod | Reviewer: MHardner | G:\Widwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbSoilsGroup1_NoCAT.mxd

Legend

- Installation Area
- Group 1 Septic Tank Sites
- Surface Water
- Active Dune Land Gypsum
- Duneland Yesum Association
- Holloman-Gypsum Land-Yesum complex
- Intermittent Water
- Mead Silty Clay Loam
- Rock Land Warm

NAD 83 SPCS
New Mexico Central
Feet

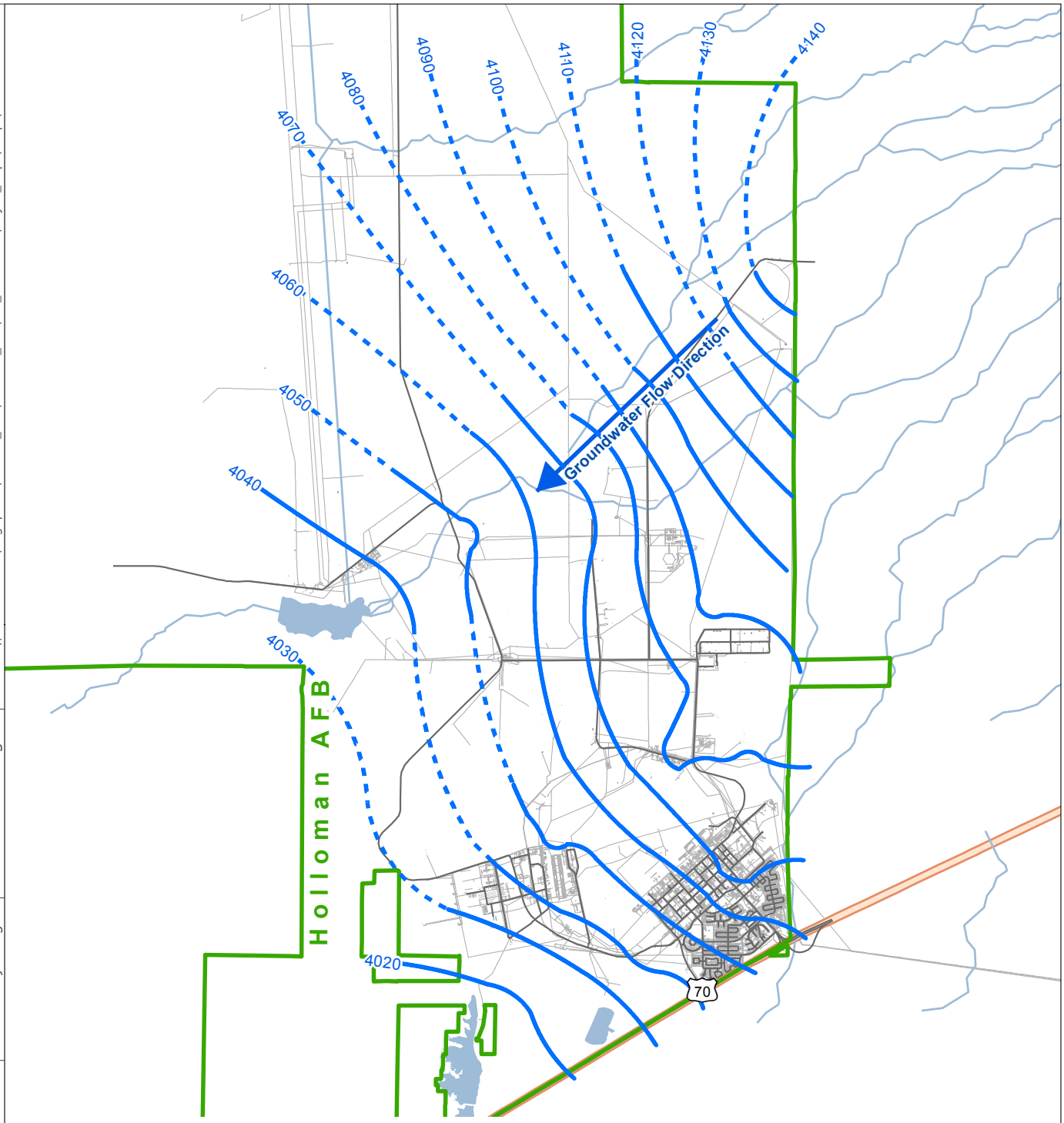
0 7,000
Feet

CBI

Figure 2-2

Septic Systems Soils Map

Holloman AFB, New Mexico



Note:
1) Groundwater contour map showing groundwater elevation contours across Holloman Air Force Base, New Mexico, are based on 2002 measurements taken from the shallow aquifer.
2) Source: Holloman AFB GIS, 2002 LTM.

08/28/13 | Office: HOU | Author: benjamin.grod | Reviewer: CLong | File Path: \\cfsfs01.cfs.com\arcgisprod2\Midwest_PBC\Holloman_AFB\GIS_Documents\Project_Maps\RfiRpt\HafbGw2002.mxd

Legend

- Installation Area
- Groundwater Flow Direction
- Groundwater Elevation Contour (ft) (Dashed where inferred)
- Surface Water

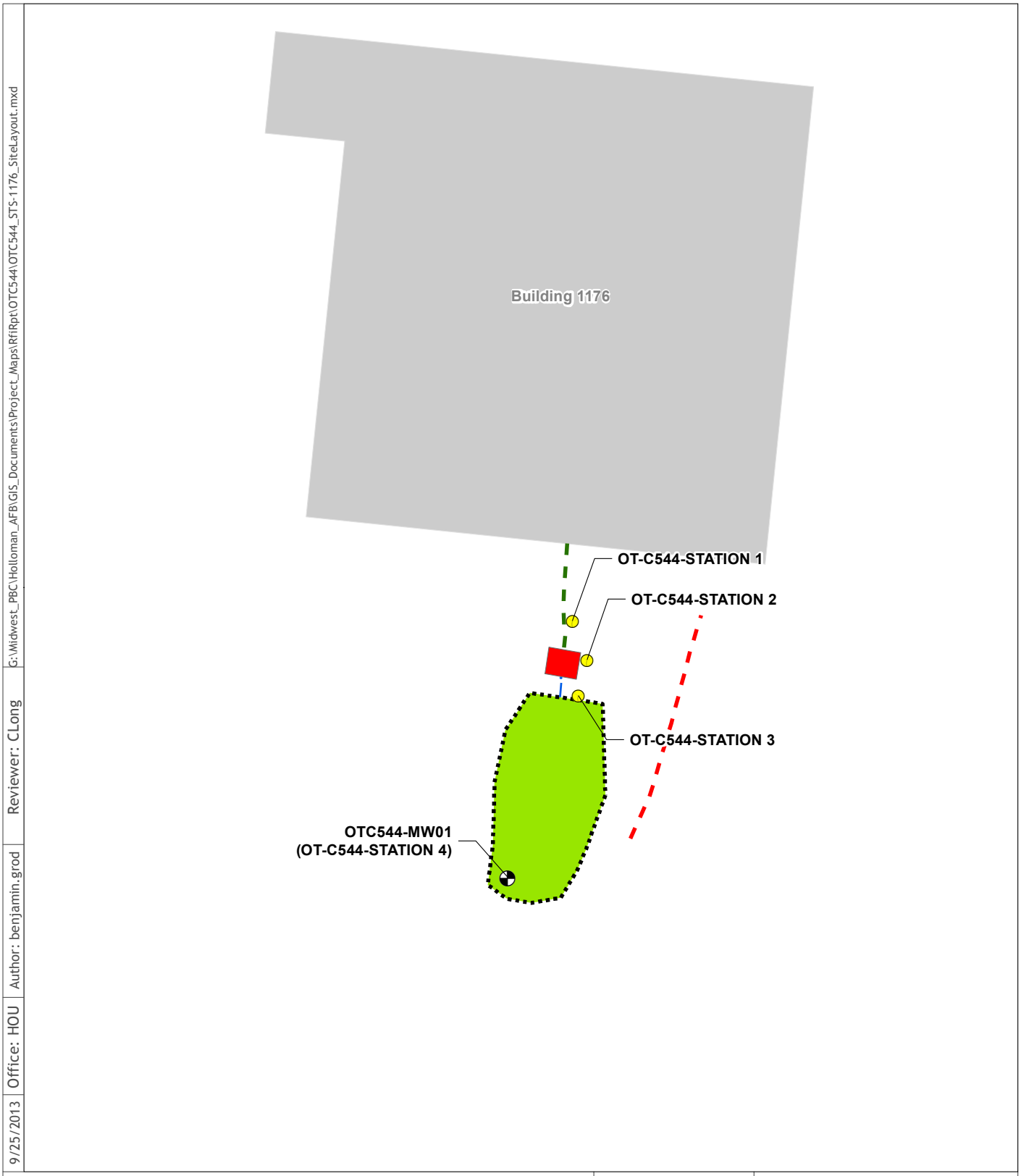
NAD 83 SPCS
New Mexico Central
Feet

0 8,000
Feet

Figure 2-3

Regional Groundwater Contour Map

Holloman AFB, New Mexico



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Legend

- Monitoring Well
- Soil Boring Station
- Abandoned Electric Utility
- Effluent Line
- Influent Line
- Septic Tank
- Leach Field
- Building

NAD 83 SPCS
New Mexico Central
Feet

0 10 20
Feet

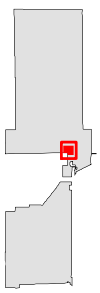


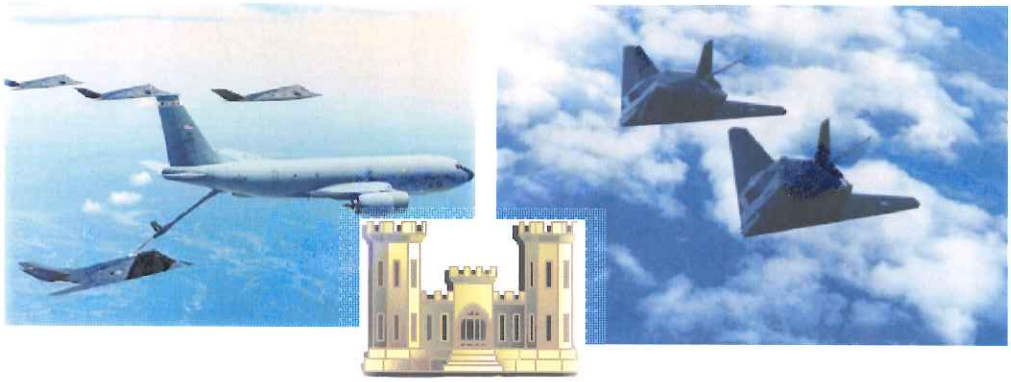
Figure 3-1

Site Layout and
Sampling Locations
Building 1176
Septic Tank System OT-C544

Holloman AFB, New Mexico

Appendix A
Historical Records

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS



Holloman Air Force Base
New Mexico

APRIL 2007

Headquarters, Air Combat Command
Langley Air Force Base, Virginia

49 CES/CEV
Holloman Air Force Base, New Mexico

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH FIGHTER WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

APR 27 2007

MEMORANDUM FOR NEW MEXICO ENVIRONMENT DEPARTMENT
Attn: Mr. James P. Bearzi
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe NM 87505-6303

FROM: 49 CES/CEV
550 Tabosa Ave.
Holloman AFB NM 88330-8458

SUBJECT: Submittal of Information Required by NMED Letter of August 30, 2006
Septic Tanks and Associated Drain Fields, Holloman AFB
EPA ID# NM6572124422

1. Pursuant to Part 4, Condition IV.B.3 of Permit No. NM6572124422, Holloman AFB is submitting the final portion of the required information.

2. This final portion of the required information covers the history of the facilities served by each septic tank and, based on the historic activities that occurred in each facility, the possible wastes that were discharged into the septic systems.

3. If you have any questions or comments, please contact Mr. Dave Griffin or Mr. George Fish at (505) 572-3931.

DEBORAH J. HARTELL
Chief, Environmental Flight

cc: w/Attachments
Mr. Cornelius Amindyas
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

Mr. David Strasser
Hazardous Waste Bureau
5500 San Antonio Dr. NE
Albuquerque NM 87109

HOLLOMAN AIR FORCE BASE
SEPTIC TANKS
HISTORY

Holloman's records show a list of fifty seven (57) septic tank systems broken into three categories- Active Septic Systems, Inactive Septic Systems, and Removed Septic Systems. The systems are identified by the Building number they are/were attached to. There are twenty five (25) Active Septic Systems which are listed in this report. There are twenty one (21) Inactive Septic Systems that are listed and the history of activities in the building associated with the system is identified to the extent of available knowledge. There are eleven (11) Removed Septic Systems listed with histories based on available record knowledge.

The Active systems are identified, but no histories of the buildings are provided as this will likely change over time particularly with change in mission (aircraft on base) or tie-in to the base waste water treatment system. A history will be added to this list if and when the septic system is no longer needed and moved to the Inactive or Removed list.

The Inactive systems are scheduled for proper closure per guidance given in the NMED Liquid Waste Regulation 20.7.3.307 NMAC. This regulation calls for capping of the line(s) from the building to the septic tank, pumping out the tanks contents, penetration of the bottom of the tank, along with collapse of the tank roof and filling of the tank with sand or soil.

The septic systems on the Removed list have had the actual septic tank excavated and removed.

A search of Real Property records and the Historic Properties Inventory yielded the information available on the buildings. There was not information available on every building, but if new information becomes available, it will be added to the list.

Attachment 54a-e shows the current plan of where the sewer system lies to show what buildings are currently connected to Holloman's Sewer System. Any building that does not have an active septic tank is either abandoned or connect to Holloman's Sewer System.

ACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	149	1998		1000
2	312	1994		1000
3	375	1968		500
4	882			
5	864 (863)	1994	5'x8'x6'4"	750
6	885	1970	7'10"x4'8"x6'10"	1000
7	886			
8	887	1991		1000
9	923	1959	4'2"x7"x7'9.5"	1600
10	1022	1992		1200
11	1066	1994		1000
12	1160	1957	5'x12'4"x7'6"	1500
13	1161	1957		750
14	1162	1957		350
15	1163	1957		350
16	1169	1962		1680
17	1195	1962		1260
18	1256	1970	12'8"x4'8"x5'	
19	1270			
20	1271			
21	1278	2004		1250
22	1284			
23	1625			
24	75600	1989		1200
25	La Luz Gate (1290)(**1292**)	2004		1250

INACTIVE SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	308	1965		
2	920	1959	4'2"x7"x7'9.5"	1600
3	921	1959	4'2"x7"x7'9.5"	1600
4	922	1959	4'2"x7"x7'9.5"	1600
5	924	1959	4'2"x7"x7'9.5"	1600
6	1091	1969	6'8"x3'x8'5"	
7	1097	1987	5'10"x5'x7'8"	1672
8	1190	1952	9'x4'x8'10"	3000
9	1194	1987	4'x4'x8'10"	1350
10	1196	1993	4'6"x11'x6'	1300
11	1199	1957		500
12	1200	1954	4'x8'x4'	1000
13	1201	1951	2'6"x6'6"x5'5"	650
14	1219	1985	5'4"x10'6"x8'4"	
15	1221	1983	4'8"x9'4"x6'2"	1100
16	1226	1985	5'6'2"x6'	
17	1235	1986		1189
18	1239	1977	4'6"x8'6"x6'	750
19	1250	1957		350
20	1251			
21	1269	1966	4'6"x9'	500

INACTIVE SEPTIC SYSTEMS

BUILDING 308

This is a 3200 SF building originally constructed in 1965. The original operation in the building was calibration of guided weapons for aircraft. In the 1970s and early 1980s the building was used as a nosedock for F-4 - Test Aircraft Radar electronic work area. It has never had a floor drain.
This facility is currently being used to store air craft support equipment for Building 309. The shop has been used in the past for servicing, inspecting, and repairing AGE equipment, but due to the reduction in personnel, this work is currently only performed in Building 309. The need to expand the work area for AGE equipment maintenance into Building 308 in the near future is not anticipated. A current view of the building is shown below in Figure 1.

Figure 1: Picture of Bldg. 308

Facilities associated with the septic system consist of:

- Toilet
- Lavatory
- Janitorial Sink

The building is located at 340 Delaware Ave. The point of contact for this building is Ms. Vicky Cruz and Mr. Adam Ferrara, they can be reached at 575-~~475~~-5272. The hours

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of operation for this building when it is in use is one 8.5 hr shift (0630-1500) and one 9 hr shift (1500-2400), five days per week.

Industrial Wastewater Drainage: There are no floor or trench drains in this facility. A janitor's sink is located in the restroom. The sanitary sewer pipe from the restroom connects with the pipe from the restrooms in Building in 309. The effluent pipe then proceeds south to Manhole 334E the layout of this facility can be seen below in **Figure 2**. At the time of the inspection surveyors were unable to open Manhole 334E. No cross-connections to the storm sewer were identified.

Industrial Wastewater Sources/Existing Pretreatment/ Existing Management Practices: There is only once source of industrial wastewater from this facility: floor washing

Floor Washing: The floor in this facility is washed every three months using a Tennant floor scrubber, 10 gallons of water and Simple Green. Average and maximum daily wastewater flows from this activity are estimated to be less than one gallon and ten gallons, respectively. The wastewater from this activity is discharged into the French drain at Building 309; therefore, the quantity of wastewater generated by this activity is included in the flow summary for Building 309.

Existing management practices consist of sweeping the floor prior to washing it.

Site Description: Aircraft Corrosion Control
Site Specific Contingency Action Plan: See Attachment 1
Secondary Containment Routes: None
Probable Spill Route: Leaks dissipate in local area on ground
Material Compatibility: No material incompatibilities

Connected to Sewer?

Stored Substances:

Chemical	Container Type
MEK	1 gallon can
Polyurethane Paint	1 gallon can
Naptha	1 gallon can
Toluene	1 gallon can
Epoxy Primer	1 gallon can
PD-680 Type II	55 gallon drum
Waste Paint/Thinners	55 gallon drum

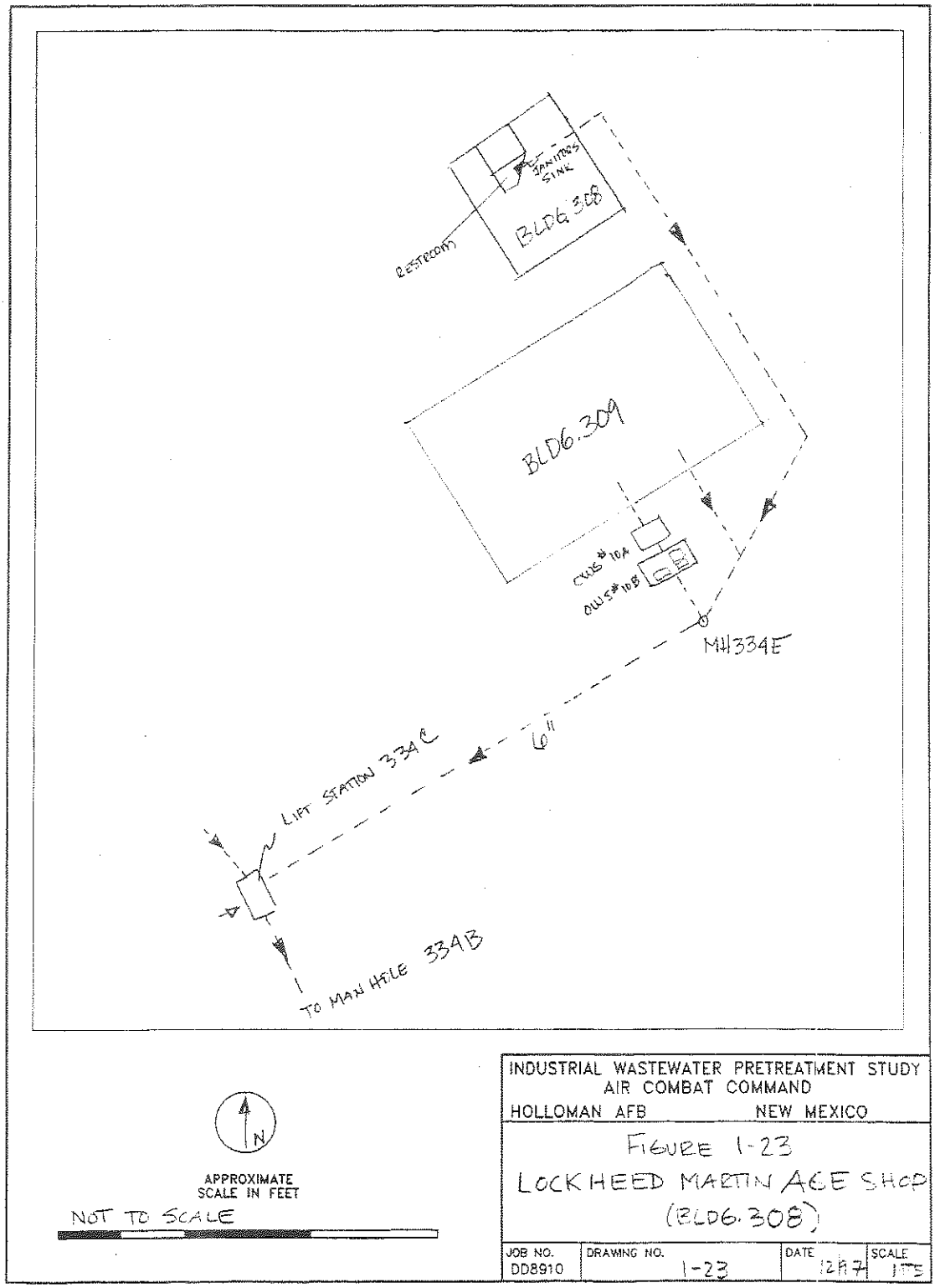

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Figure 2: Layout of Bldg. 308 and 309

INACTIVE SEPTIC SYSTEMS

BUILDINGS 920, 921, 922

These are three identical buildings constructed in 1959. Each building has 1900 SF. They were originally built for ammunition assembly which primarily consisted of bolting rocket components together prior to use. All three buildings are presently vacant and empty.
Each of the three buildings has a simple bathroom consisting of a:

- Toilet
- Lavatory

Multiple inspections were set up for this site, but no one showed up. Therefore, no follow-up information was found. Pictures of the current buildings are shown below in Figures 3-5.

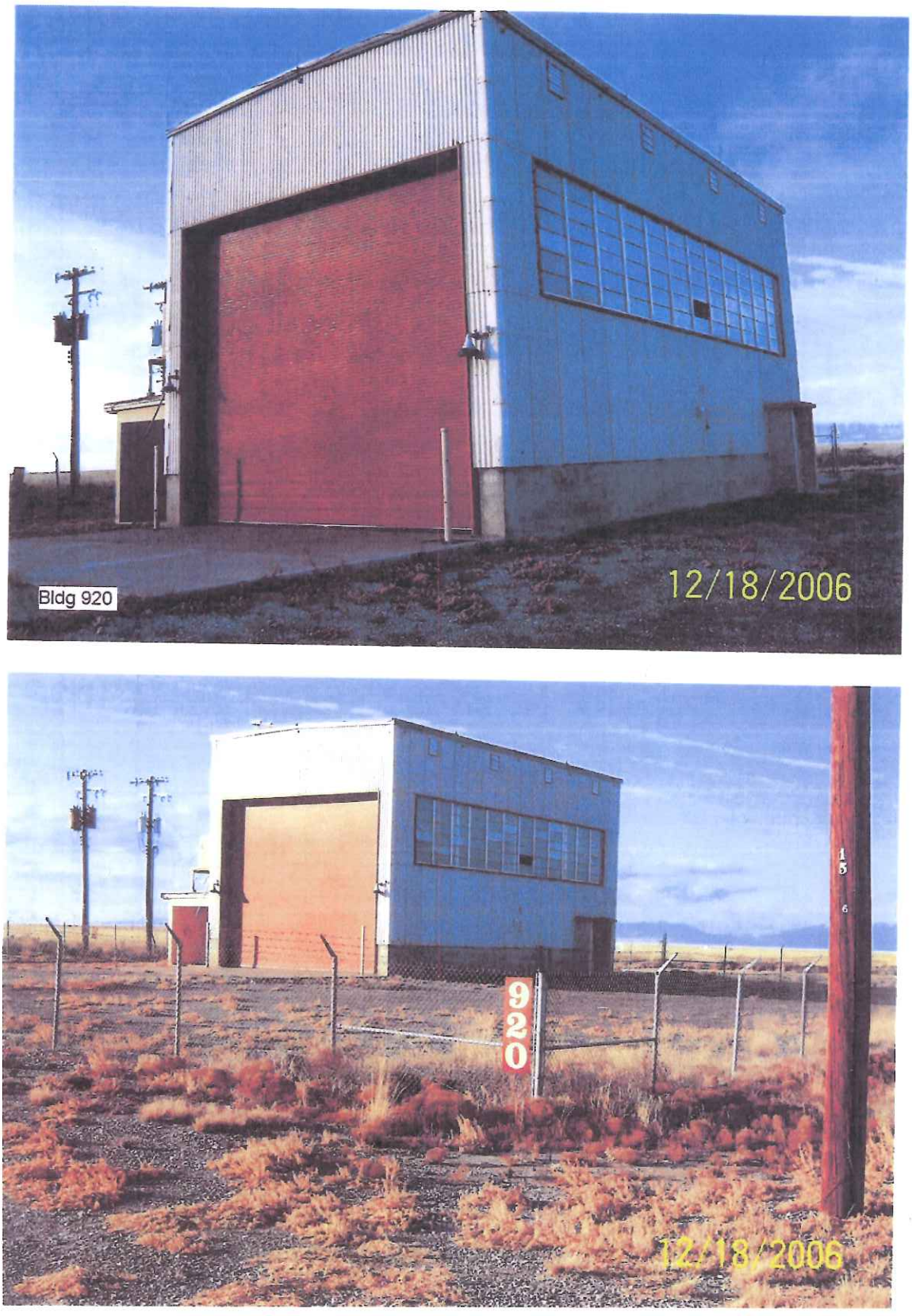


Figure 3: Pictures of Bldg. 920

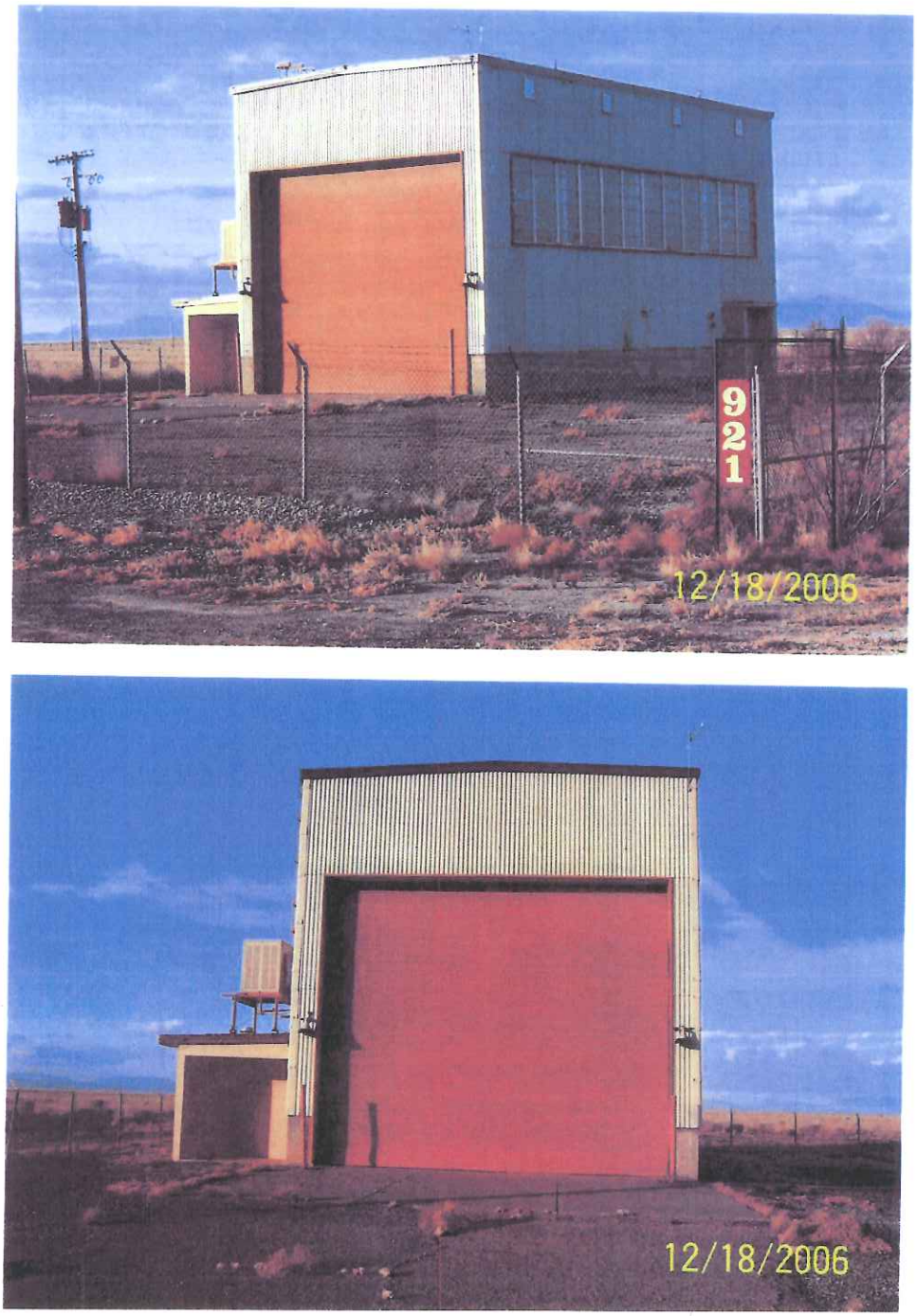


Figure 4: Pictures of Bldg. 921

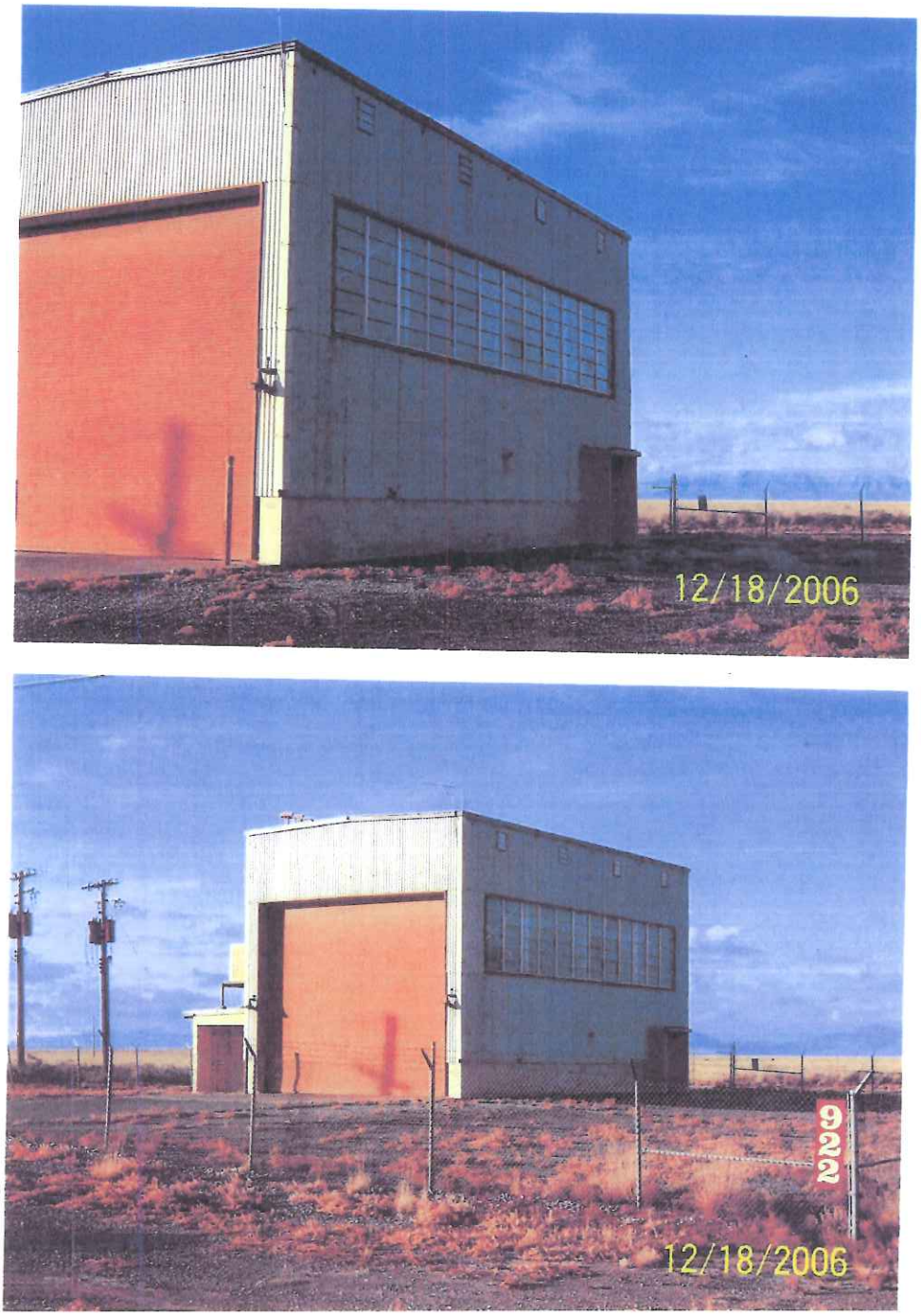


Figure 5: Pictures of Bldg. 922

INACTIVE SEPTIC SYSTEMS

BUILDING 924

This building was constructed in 1959 and has 4800 SF.
The building's original service was ammunition assembly similar to buildings 920-922.
It was later used for maintenance of radar tracking equipment.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

An on site inspection was done for this building on 20 Dec 2007 with the current facility manager, Mr. Michael Tackett. He did not have any information about the history of the septic tank system. Currently the building is being used for munitions storage. For the past two year it has stored rocket motors for the test track. From the on site inspection and drawings (Attachment 4-6) it can be seen that the bathroom drain is separate and there are no floor drains.

There are no pictures on file of this building.

INACTIVE SEPTIC SYSTEMS

BUILDING 1091

Site Description: There are no current files on this building because the building has been demolished. The building served as the Airfield Control Tower until replaced by the present Control Tower
On Attachment 55b a drawing of where the leach field was located in 1984 can be seen.
Grid Coordinates: J.9, 10.2
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: No secondary containment associated with underground storage tank
Probable Spill Route: Leakage from underground tank will contaminate water table in local vicinity

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 / UST

There were also three drawings that were discovered during the research stage of the project. The drawing (Attachment 7) shows the Septic Tank Details, Septic Tank Drain Field and the Drain Field Details.

INACTIVE SEPTIC SYSTEMS

BUILDING 1097

Specifications and history of this building are given in the following "Cold War Survey: Holloman Air Force Base". Along with this survey an on site inspection was done on 28 November 2007 with the current facility managers, A1C Clinton Bennett and TSgt Robert Edyburn. During the on site inspection it was discovered that the bathroom is separated from work area drains. In the past the building was used as a communications work center (office space) until 2005. There are no floor drains in the work area. It is currently being used as a houses base for a radio system network. There were also three drawings (Attachment 8-10) that were discovered in the investigation phase of the project. The drawings show the Materials Septic System, the Septic Tank Placement and Piping, the Latrine Plan, and the Mechanical Plumbing Plan.

Facilities in this building consist of:

- Toilet
- Urinal
- Lavatory

Description: Communications facility
Site Specific Contingency Action: See Attachment 1
Secondary Containment Route: None
Probable Spill Route: Leaks dissipate in local area on ground

Tank Location: South of facility
Fuel Flow – South/West

Substance	Vol/No of Tanks/Type
Diesel	250 gal each/ 1 /AST
	500 gal each/ 1 /UST (Abandoned)

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Communications, Receiver.
Historic: Transmitter/Receiver.
Street Address: 1432 Sabre Road, HAFB, 88330-7842.

Building Number: 1097

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [ ] Minor [ ] Moderate [x] Major

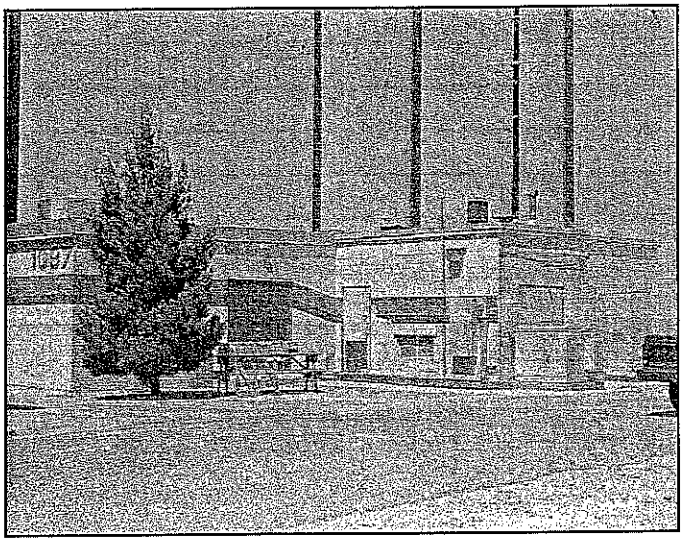
Comments:

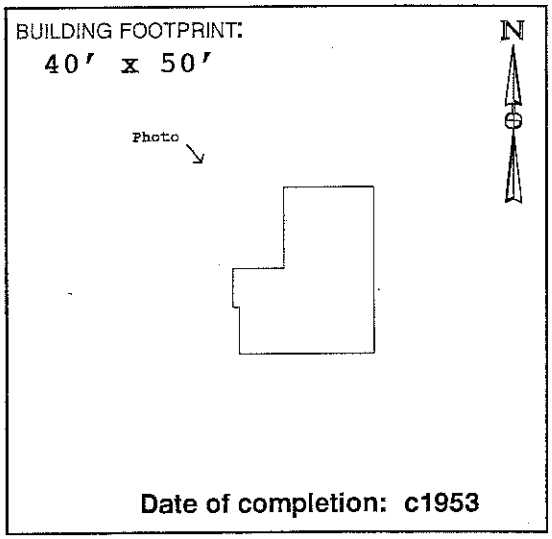
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1097 has not retained historic integrity.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1953

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1097 is a small transmitter building designed with few embellishments for utilitarian use only. Building 1097 originally had a rectangular footprint identical to Building 1098 and Building 1095. The original floor plan was sectioned into 4 rooms. An addition was constructed at the west elevation in 1986 using compatible structural and architectural components (CE File #1097-1). Both the builder and the architect are unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1097.

Current Function: Receiver/Air Traffic Control/Radio Control.

Original Function: Transmitter/Receiving/Communications.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1098-1 (c1952).

Foundation: Concrete wall footing. Concrete slab on granular fill.

Exterior walls: Painted concrete masonary units (CMU).

Roof: BUR on 2" rigid insul.; 2" poured gypsum on gyp board sup. by steel joists.

Notable interior features, including machinery:
Construction drawings document *"UHF Radio Air/Ground Facilities AN/GRC-27"*.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:
Continues to function as a communications facility/receiver site.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1097 has served as a Base communications facility since its completion c1953. Several renovations have resulted in a loss of historic integrity for this building. Building 1097 is no longer eligible for the National Register of Historic Places.

VII. ASSOCIATED BUILDINGS:

Location plan CE File #1098-2 identifies at least three north area transmitter sites. Building 1097 was associated with transmitter Building 1098. This facility is also associated with the flightline, and with communications Building 221.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building #1097 retains its original function as a radio receiver facility, however it has been modified to accommodate electrical, mechanical, and equipment additions and change-outs. Original equipment has been replaced.

Office space was added to the south elevation (1986: CE File #1097-1). All six windows at the north, east and west elevations have been blocked in. Original doors have been replaced. Vinyl floor tile covers original tile throughout. Dropped ceilings have been added.

This building, although retaining historic significance as a receiving site, has lost integrity of design, materials, workmanship, and association with its period of significance. Note: A Sgt. Boots (extension 3132) was identified by Building 1097 personnel as being a possible source for oral history research concerning specific activities associated with this facility.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Office space added to the west elevation (c1986: CE File #1097-1).

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [x] Retains very little [ ] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Construction of adjacent buildings has altered viewshed.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Windows have been blocked in.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: An addition obscures the original west elevation. The original window treatments removed. Dropped ceilings added. Original asphalt floor tile covered.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: The presence of interior communications equipment and exterior poles contribute to the integrity of feeling as a radio site.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

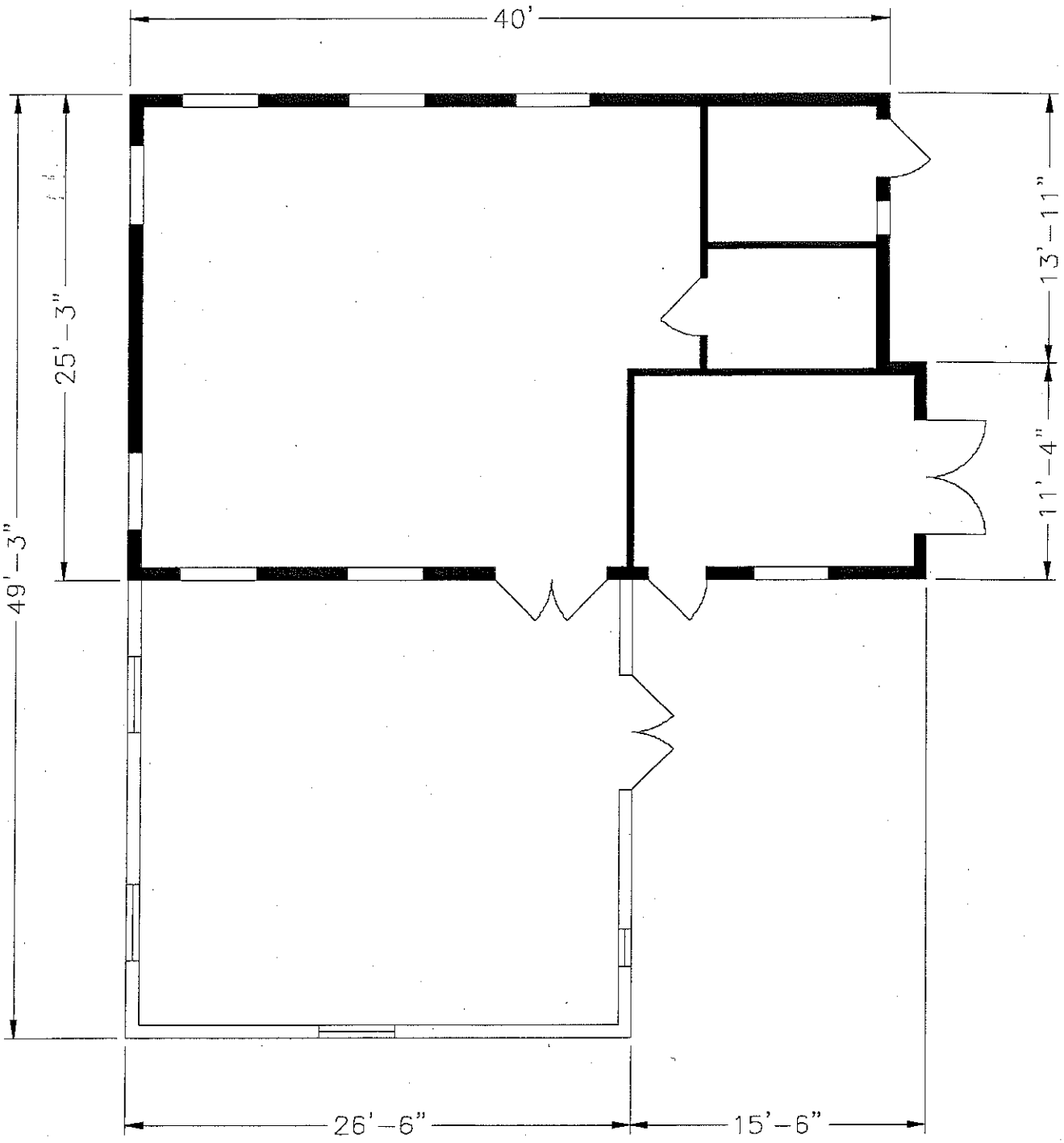
Comments: Original equipment has all been replaced.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #81**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



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Source: CE File #1098-2 (c1971)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1097** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1190

This building was constructed in 1952 and demolished in 2002. Specifications and history are provided in the "Cold War Survey".

The only drawing discovered was the plumbing floor plan and it can be seen in Attachment 11. Attachment 55d shows the current location of the leach field in 1984.

2002 Demolished Due To Unrelated Condition

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Security Police Building.
Historic: Change House/Unconventional Fuel Storage.
Street Address: 1514 Lethal Road, HAFB, 88330-7840.

Building Number: 1190

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1190 is in need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

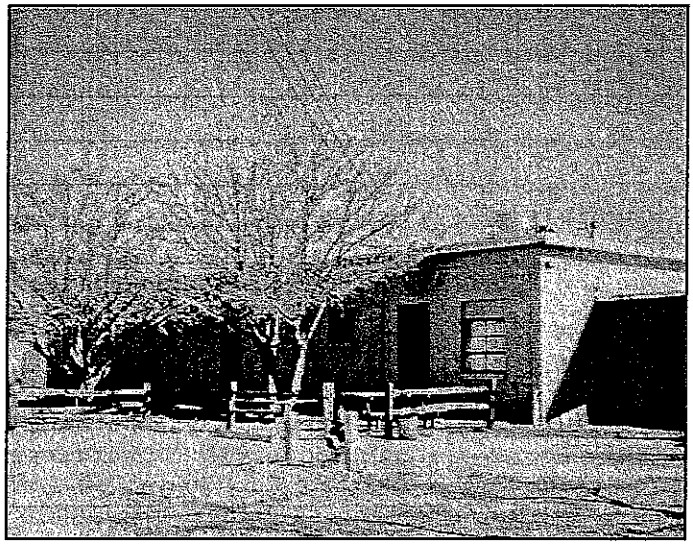
Comments: Interior partitions have been removed (date unknown).

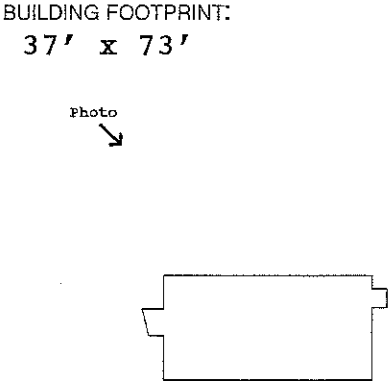
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1190 is a single-story, flat-roofed, concrete masonry unit (CMU) building exhibiting large roll-up equipment doors, numerous personnel access doors, and asymmetrical window fenestration. Construction drawings prepared in 1951 were stamped "As-built" but were not stamped in the revision block. Real Property Accountable Record/1190 indicates that Building 1190 was completed c1952 as a Change House for unconventional fuels personnel. W. C. Kruger Company (Santa Fe, NM) provided the construction drawings stored in CE File #1190. The builder is not known. A comparison of the current building and original blueprints reveals that no structural modifications to the building have occurred.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1190; CE File 1195-1 (c1951).

Current Function: Security Police operations.

Original Function: Change House, Unconventional Fuels.

Interim Functions: "RC Con House" (n.d.); "Prpln R-L Fuel/Lub" (n.d.); Prop Res Lab Rocket" (n.d.); "Prpln R-L Rkt" (n.d.); Sp Operations (n.d.).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1190-1 (c1951).

Foundation: Poured concrete footings and grade beams; concrete slab.

Exterior walls: Concrete masonry units (CMU).

Roof: (Built-up) gravel on rigid insul.; 2" slab sup. by metal lath and steel joists.

Notable interior features, including machinery: Shower stalls, locker room, dressing room, and laboratories.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

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VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Recommend reassessment of Building 1190 once the fifty-year construction date is met in the year 2002. This building retains historic integrity.

VII. ASSOCIATED BUILDINGS:

According to CE File #1190-1 *Title Sheet*, Unconventional Fuels Storage Building 1190 was associated with Building 1194 (Booster Inspection), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

This building retains all aspects of historic integrity. Although not meeting the "exceptional importance" standard imposed on buildings constructed within the last fifty years, Building 1190 remains potentially eligible as an individual property once the fifty-year date of construction is met in the year 2002. Recommend inclusion in a Multiple Property nomination along with the other unconventional fuels storage buildings. Building 1190 is currently being used as a storage and administrative facility by the 49th Squadron Security Police personnel. The original shower stalls, dressing room, locker room, shop, tools and supply rooms are all used for storage. Free-standing shelves have been installed to accommodate storage. As a result, some original doors and windows are blocked from view. Minor alterations have occurred at the interior. Two partitions have been removed. Glazed tile walls appear to have been added to at least one office. Vinyl tile has been installed over one section of the concrete slab in what once served as a machine shop. Some of the window panes have been painted. Because this facility remains potentially eligible, recommend that the original design features be considered in future modifications, and that photographs document any changes to the essential features. Suggested routine maintenance: Prune trees away from principal facade. Noticeable water damage warrants inspection of the roof. Replace broken window panes. Repair hole at exterior south elevation wall.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: Interior room layout as a Change House remains a key design element. This layout includes large open interior spaces, smaller labs/offices, and showers, dressing, and locker rooms used by unconventional fuels personnel.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Although no longer used as such, Building 1190 continues to be situated in the vicinity of other buildings historically associated with unconventional fuels testing and storage. This building appears to been recently landscaped.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two interior partitions removed. Glazed tile walls in office rather than CMU shown on original drawings.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Nearly all original workmanship remains visible, particularly at exterior.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Aside from the change in operations occurring here, Building 1190 remains essentially as it was originally constructed.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity

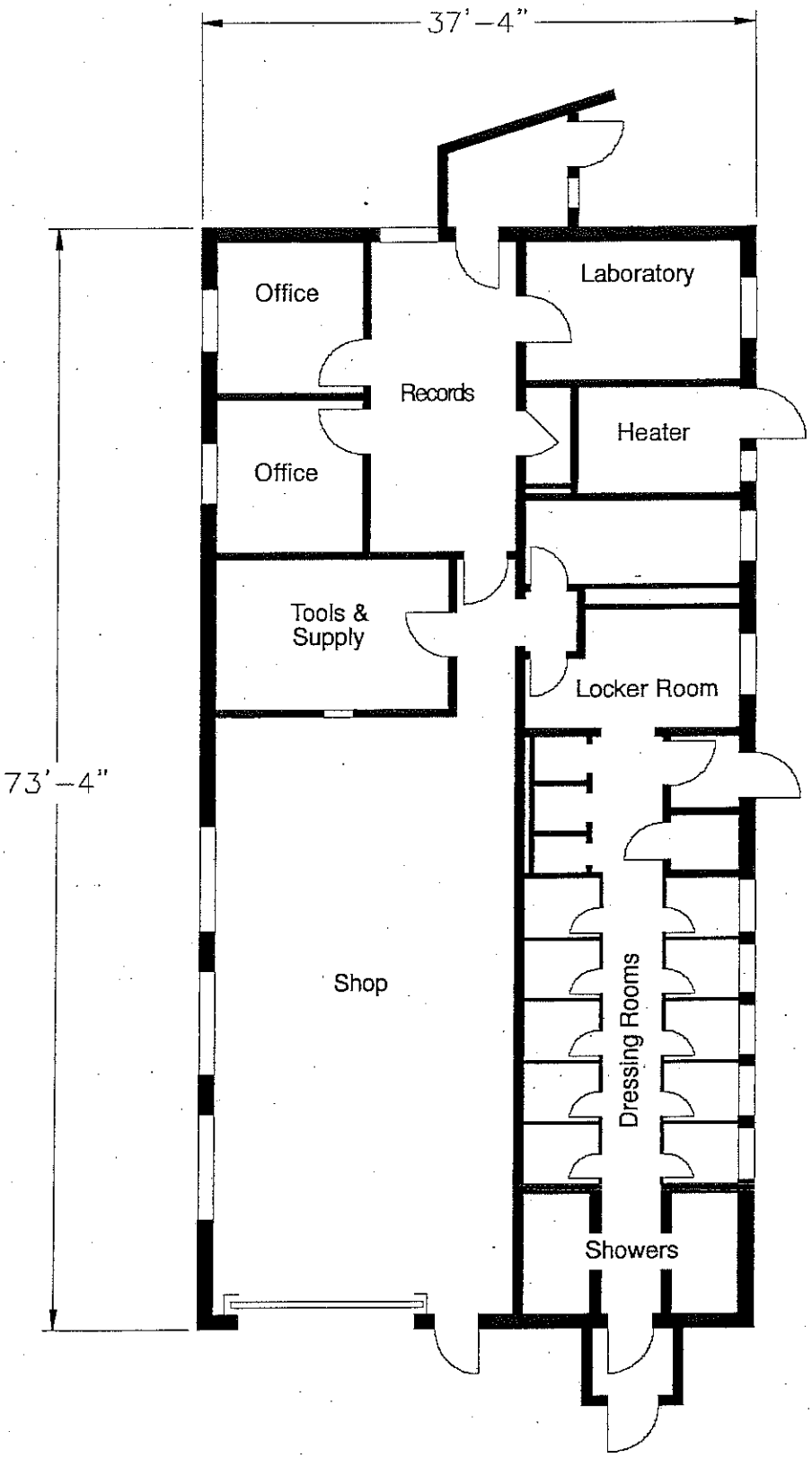
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #-Photo #**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1190-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1190** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Mike Gardner* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1194

Specifications and history are given in the "Cold War Survey".
Facilities in this building consist of:

- Toilet
- Lavatory

An on site inspection was done on 7 Jan 08 with the current facility manager, SSgt Joshua Roberts. In the inspection it was noted that the bathroom is separated from the work area drain. There was no history known. The building is currently being used for storage and it has been used for storage and has been used for storage for the past ten years.
Attachment 55d shows where the leach field for Bldg.1194 was located in 1984.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME: **Building Number:**

Current: Research Equipment Storage.

Historic: Booster Inspection/Unconventional Fuel.

Street Address: 1584 Lethal Rd., HAFB, 88330-7840. **1194**

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1194 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

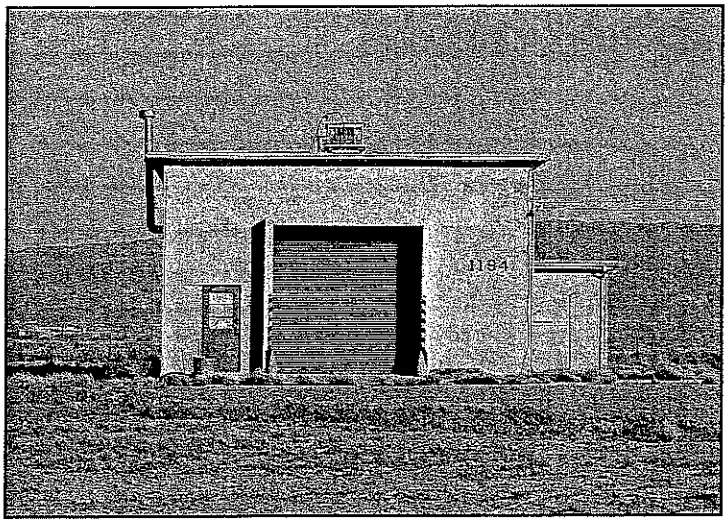
Comments: Interior partitioning is reversible.

Preliminary Determination of National or State Register Eligibility:

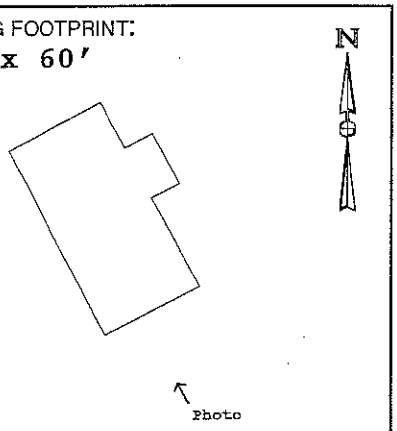
[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Does not meet "exceptional importance" rule. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.



BUILDING FOOTPRINT:
30' x 60'



Date of completion: c1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1194 is a rectangular, single-story, high bay structure made of concrete masonry units (CMU) and exhibiting a flat roof. The principal elevation faces west, showing one large roll-up door, and one personnel door. One row of windows is located below the eave line at the north and south elevations. The ceiling at the interior is exposed. "As-built" construction drawings show that Building 1194 was completed in 1952. W. C. Kruger Co. (Santa Fe, NM) provided the architectural work (1952: CE File 1194). The builder is unknown. No structural modifications to the original structure were noted.

III. HISTORIC AND CURRENT USE:

Current Function: Research equipment storage.

Original Function: Missile Assembly Test Building/Booster Inspection.

Interim Functions: "Mls/Space Rsch Tst" (n.d.); "M/Assembly Test Bldg" (n.d.); "Shp Wpn and Rlse Sys" (c1976); "BE Stor Cv Fclty" (n.d.); "Rsch Equip Stor" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1195-1 (c1952).

Foundation: Poured concrete footings and stem wall. Slab on compacted fill.

Exterior walls: CMU between concrete columns and bond beams.

Roof: BUR gravel. Rigid insulation. 2" concrete deck supported by steel joists.

Notable interior features, including machinery:

4-ton Wright Company chain-operated crane and hoist system, hoist no. 5197, serial no. 4925. The hoist is attached to a runway "I"-beam (crane) supported by steel support beams. Large metal roll-up doors at east and west elevations.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

210

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1194, although not meeting the "exceptional importance" standard, may be eligible for the National Register for its role in early Cold War materiel development once the fifty-year construction date is met in 2002.

VII. ASSOCIATED BUILDINGS:

According to CE File #1195-1 (c1951) *Title Sheet*, Building 1194 was associated with Building 1190 (Change House), Building 1192 (Add Storage), Building 1191 (Aniline Storage), Building 1193 (Continuity Check Stand), and Building 1195 (Solid Fuel Conditioning).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1194 remains essentially as it was constructed c1952. The original floor plan layout included one main room and an equipment room. A small area in the northwest corner of the main room has been partitioned. No documentation was found pertaining to this modification. This minor partitioning of the main room is reversible. This building is no longer associated with either missile assembly and test activities or unconventional fuels storage, and currently serves as an equipment storage room for the 6585th Test Group. Construction drawings (1956: CE File # 1194-1) show that an addition to this building was planned. There is no indication that this addition was ever built. Because this building retains historic integrity, and may be eligible for the National Register under Criteria A and/or C once the 50-year construction date is reached in the year 2002, recommend that future modifications take essential design features into account. Note: One isolated occurrence of prehistoric artifacts was noted on the grounds north of the building, including one white chert core, and one secondary chert flake.

Suggested routine maintenance: Scrape, prime, and paint the exterior. Replace downspouts. Prune landscape plantings away from foundation.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Construction drawings show plans for an addition to the north elevation (1956: CE File #1194-1). There is no evidence that this addition was ever built.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The high open-bay floor plan allowing the crane and hoist system, and the large metal equipment roll-up doors remain as key design elements.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Buildings 1193 and 1194 remain in an unmodified and isolated setting.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Nearly all of the historic materials used to construct this building remain visible.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Two doors have been replaced. All windows appear to be original. Interior partitions at the northwest corner divide the original floor plan.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Although retaining its original open floor plan, this building is currently used for storage of modern equipment.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

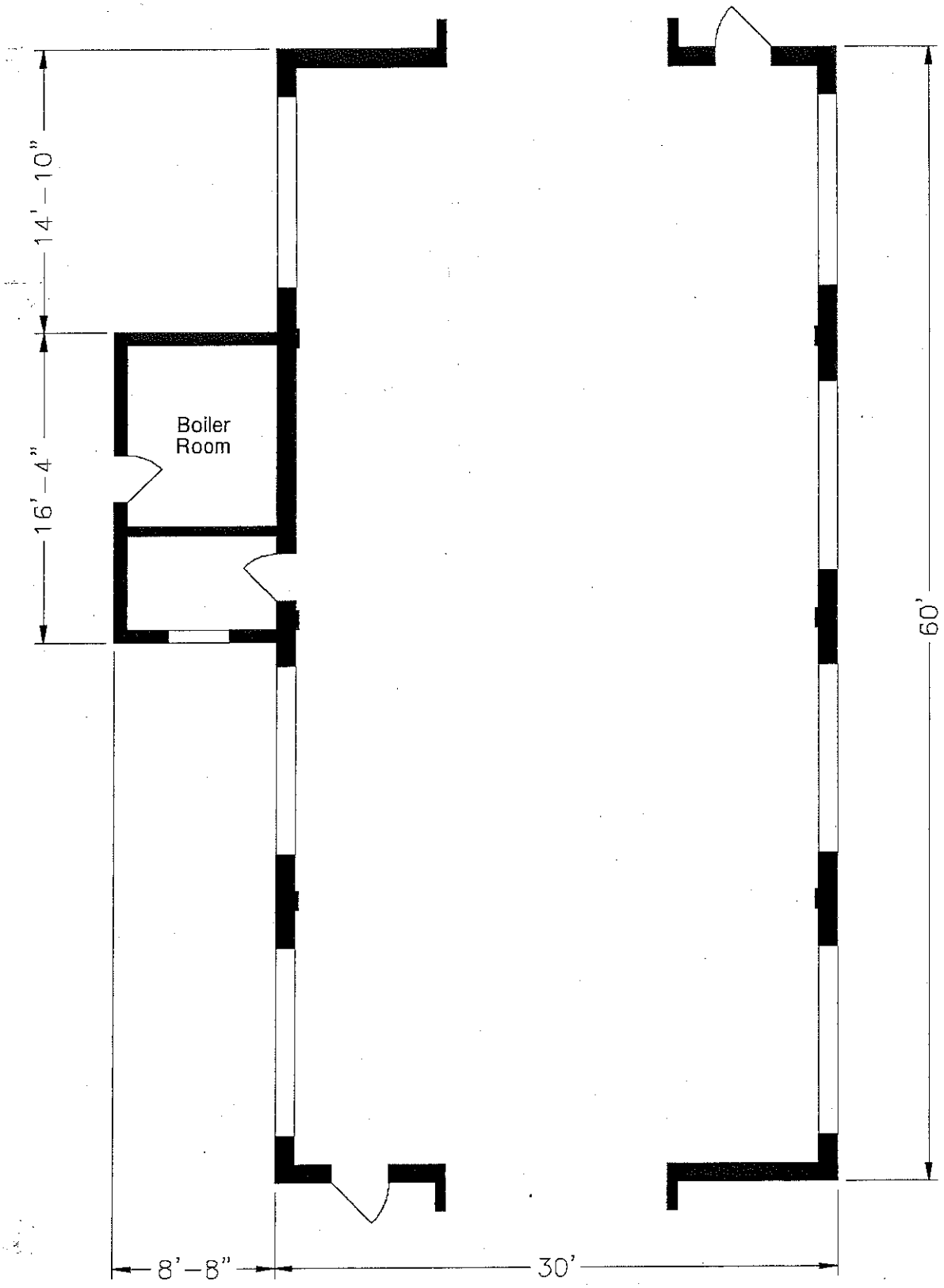
Comments: The open floor plan, isolated setting, hoist system, and nearby continuity check stand (Building 1193) contribute to this building's integrity of association.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #3-Photo #31**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1195-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1194** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**	NEW MEXICO STATE UNIVERSITY

INACTIVE SEPTIC SYSTEMS

BUILDING 1196

This building was constructed in 1956. It originally built for missile assembly, but is now in communications equipment storage.
The original facilities consisted of:

- Toilet
- Lavatory

These facilities were replaced in 1975 with:

- Toilet
- Urinal
- Lavatory

An on site inspection for this building was done on 4 Dec 07 with the current facility manager Sgt Lander. The information gathered from this inspection was that there were not any floor drains located within the building. In the past it was used for TAC can and for the past ten years it has been used for storage.
Attachment 55d shows where the leach field for Bldg. 1196 was located in 1984.

Figure 6: Picture of Bldg. 1196

INACTIVE SEPTIC SYSTEMS

BUILDING 1199

This building was constructed in 1957. It was originally built as a rocket fuel laboratory. In 1987 it was converted to the Security Forces Kennel.
As the fuels laboratory, it contained:

- Toilet
- Urinal
- Lavatory
- Shower

After conversion to the kennel, the facilities were changed to:

- Toilet
- Urinal
- Stainless Steel Sink

During the investigation stage of the project there were drawings found for building 1199. Attachment 12 and 13 are of the Site Plan, the Sewer Isometric, the Plumbing Plan and the Floor Plan.

Along with the drawings that were found an on site inspection was completed on 29 Nov 07 with the current facility manager, SSgt Gilmore. A new Security Forces Kennel area has been built and now the building is currently being used to house animals until they can be transferred to Alamogordo Animal Control.

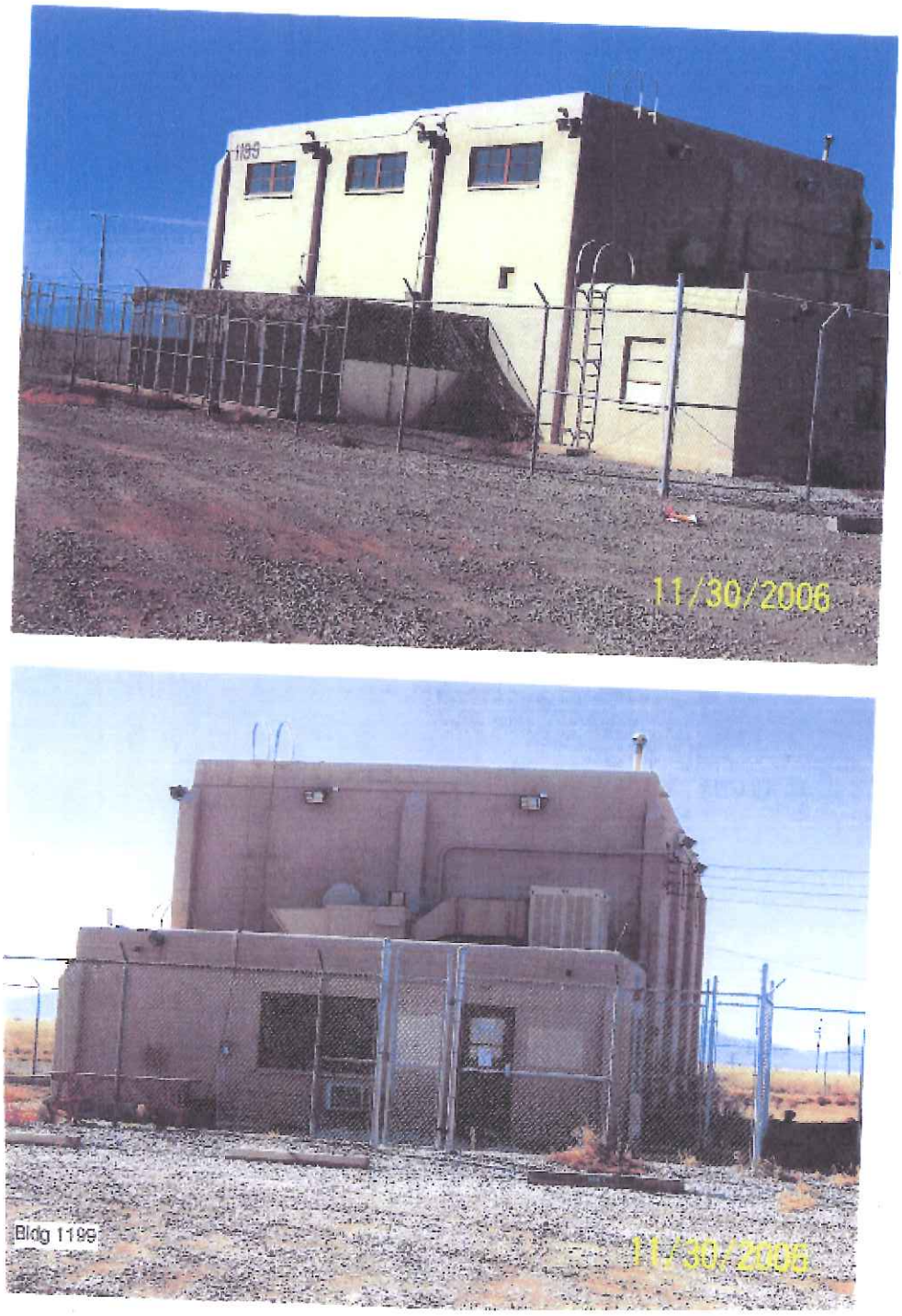


Figure 7: Pictures of Bldg 1199

INACTIVE SEPTIC SYSTEMS

BUILDING 1200

Specifications and History: See "Cold War Survey".

Three drawings were found for this building. These drawings show the Plumbing Floor Plan (Attachment 14), a Floor Plan (Attachment 15) and the Septic Tank and Drain Field (Attachment 16).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab, Medical (VACANT).
Historic: Space Biology Laboratory.
Street Address: 841 Douglas Road, HAFB, 88330-7823.

Building Number: 1200

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [ ] Needs maintenance [x] Deteriorated [ ] Archaeological

Comments: Building 1200 is abandoned, and showing signs of deterioration.

Degree of Alteration: [ ] None [ ] Minor [x] Moderate [ ] Major

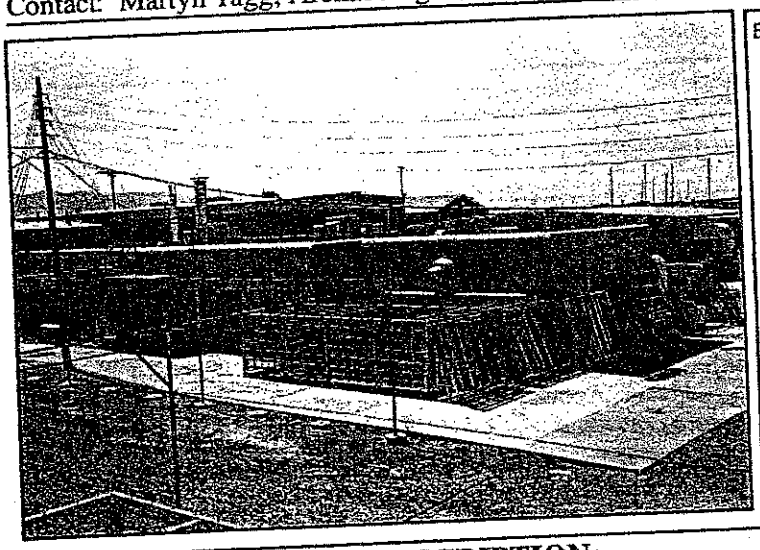
Comments: Alterations are architectural rather than structural.

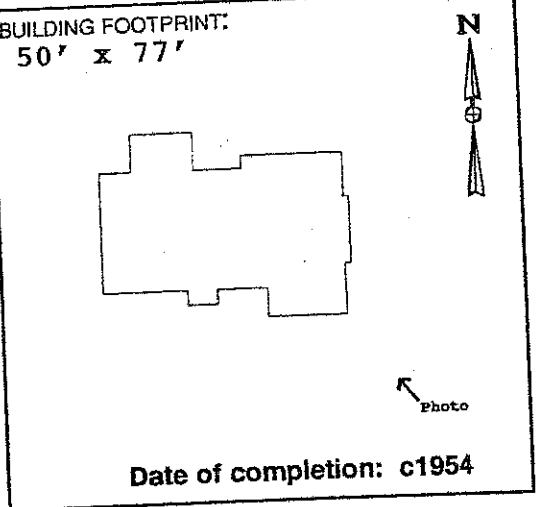
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [x] Ineligible

Comments: Building 1200 no longer retains historic integrity. See Section VI.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1954

273

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1200 is a rectangular, single-story, flat-roofed concrete masonry unit (CMU) building constructed as one of several laboratories dedicated to important aeromedical research using both animals and humans. None of the construction drawings were correctly stamped "As-built." According to Real Property Accountable Record/1200, the estimated date of construction is 1954. Subsequent improvements documented in CE File drawer #1200 include an addition to the medical lab (c1958), a covered passageway added to the boiler room (c1957), and a frame wall addition to the surgery room (c1957). Neither the builder nor the architect is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1200; Field visit Summer 1995.

Current Function: Vacant.

Original Function: Space Biology laboratory/Animal experimentation.

Interim Functions: Animal experimentation/Storage.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1200-1 (c1953).

Foundation: Concrete wall footings. Concrete slab on fill.

Exterior walls: Painted concrete masonry units (CMU).

Roof: BUR on concrete deck, supported by metal lathe and steel bar joists.

Notable interior features, including machinery:

Originally used as a medical laboratory, with work tables, work benches, built-in lockers, cabinets, operating tables, x-ray tables, etc.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Summer 1995.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery:

274

One room is currently being used for storage. All medical and laboratory equipment has been removed.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Due to extensive alterations to the exterior, Building 1200 no longer retains historic integrity. Recommend, however, that this building be considered as a contributing feature in a basewide early Cold War National Register of Historic Places Multiple Property nomination.

VII. ASSOCIATED BUILDINGS:

Building 1200 was an integral part of Holloman's aeromedical facilities, including Buildings 1201, 1202, 1203, 1204, 1205, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Since its original construction c1954, Building 1200 has been used as a laboratory and medical facility for a wide variety of research animals, including trout, black bear, dogs, mice, and chimpanzees. Although currently abandoned, this building featured a lead-lined x-ray room, an autopsy room, an observation room, a surgery room, a dark room, and animal pens (c1954: CE File #1200-1). Built-in steel lockers, metal cages, x-ray tables, work benches, food bins, operating tables, scrub sinks, surgical lamps, sterilizers, etc. have been removed. Two exterior doors have been blocked in, and thirteen exterior windows have been blocked in. One exterior door and one exterior window have been added. Interior walls have been added, removed, or relocated. A storage room has been added to the south elevation. Animal cages remain at the west elevation. The presence of dead rodents, foul odors, torn pipe and duct insulation (possible containing asbestos) and peeling paint (possible lead-based) represent hazards to health and safety. Because of the unique and important nature of the research conducted here, recommend that this building be nominated as a contributing feature as part of an HAFB early Cold War National Register Multiple Property nomination.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?
[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.
Comments: The building has been located at its present location since c1954.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?
[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact
Comments: Most of the original doors and windows have been removed. All of the equipment has been removed. Most of the original finishes have been obscured.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting
To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?
[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting
Comments: Continues to be situated in an isolated setting with the other Aeromedical facilities.

Materials: To what extent have the original materials used to construct this structure been retained?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Elevations have changed due to modified openings, an addition, and a covered passageway. Interior wainscot and cornice removed, wall tile added.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?
Exterior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%
Interior: [ ] Unable to determine [x] <25% [ ] 25% to 50% [ ] 50% to 75% [ ] >75%
Comments: Exterior walls and cages remain intact. Some architectural features remain. Most of the original interior workmanship has been lost.

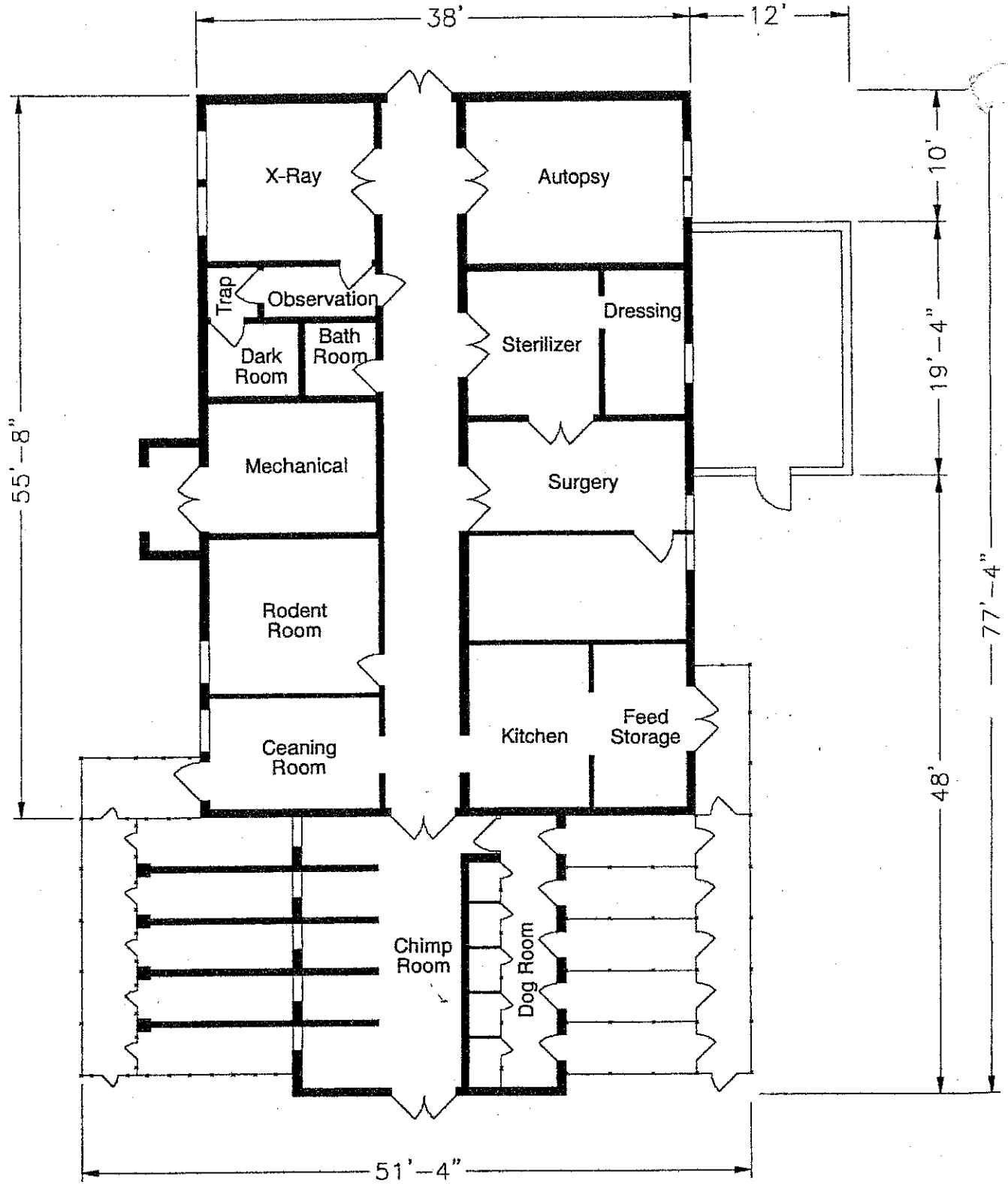
Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?
[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity
Comments: Building 1200 continues to be situated within the compound set aside for animal research. Chimpanzee research continues today in nearby buildings.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?
[ ] Unable to determine [ ] Little or no integrity remains [x] Some elements remain [ ] Retains integrity
Comments: Although all of the equipment has been removed, this building still demonstrates a link with its past by virtue of its setting, the odors, and the animal cages.

X. FURTHER INFORMATION:

Surveyed By:
Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #94**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SUMMER 1995**



Source: CE File #1200-1 (c1954)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1200** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

BUILDING 1201

Specifications and History: See "Cold War Survey"

Seven drawings were found for this building. These drawings show the Septic Tank and Absorbent Area Layout, Isometric Sewer Layout, Septic Tank Plan and Septic Tank Elevation (Attachment 17), Floor Plan (Attachment 18), Layout Plan (Attachment 19) and Systematic-Waste System (Attachment 20).

There was also an on site investigation completed on 29 Nov 07 with the current facility manager, Anthony Ortiz. During this inspection it was discovered that the bathroom drain was separate from the work area drain. In the past the building has been used for animal research in support of the space program. The building is currently not in use and has been secured and floor drains have been plugged.

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: SC Lab Medical.
Historic: Aero. Medical Field Lab.
Street Address: 821 Douglas Road, HAFB, 88330-7823.

Building Number: 1201

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Structurally intact. In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

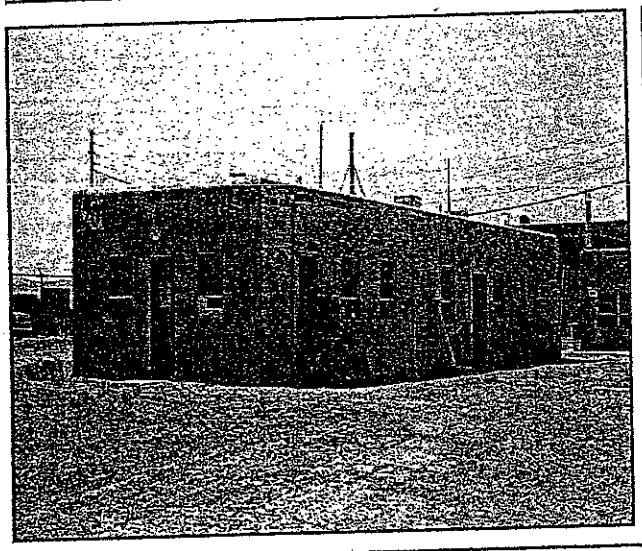
Comments: Mortuary/autopsy room added as subsequent improvement c1958.

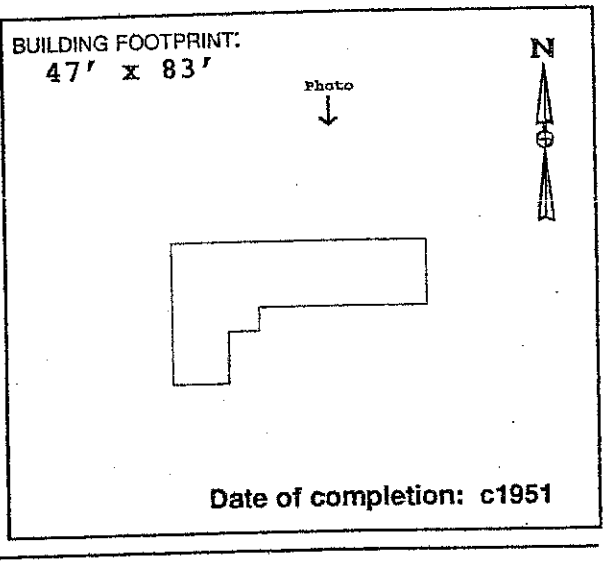
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible under Criteria A and/or C at a national level.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1951

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1201 is an "L-shaped", single-story, flat-roofed, building constructed primarily using painted 8" structural clay tile and exhibiting asymmetrical door and window placement. Animal cages occupy the west elevation. Real Property Accountable Record/1201 indicates that this science laboratory was constructed c1951. The construction drawings consulted were stamped "As-Built," although no date was given. Both the architect and builder are unknown.

At least two structural modifications may be viewed as subsequent improvements to the original building, including the addition of a Mortuary/ Autopsy Room (c1958: CE File #1201-4), and the addition of a rooftop observation deck (c1952: CE File #1201-5).

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1201.

Current Function: Carpentry shop; Employee break room; Office space.

Original Function: Aerospace Medical Lab; Animal experimentation.

Interim Functions: "SC Lab Human Eng" (n.d.); "SC Lab Med (c1968).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1201-1 (c1951).

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted structural clay tile.

Roof: Built-up roof w/ gravel on sheeting, supported by 2x12 wood joists.

Notable interior features, including machinery:

Fixed chain link cages, lab tables, equipment tables, work tables, wood storage bins, sterilizer, incubator.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL: (Based on field visit Summer 1995

[c1958 SUBSEQUENT IMPROVEMENT--MORTUARY/AUTOPSY]:

Foundation: Concrete wall footings. Concrete slab on grade.

Exterior walls: Painted cement masonry unit (CMU).

Roof: 5-Ply built up roof on concrete slab. Steel joists.

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Notable interior features, including machinery:

Washer and dryer, kitchenette, tool room, table saw, furniture, lockers.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Building 1201 is eligible to the National Register under Criteria A and/or C at a national level of significance for its vital role in early aeromedical research in support of the early Cold War space exploration mission.

VII. ASSOCIATED BUILDINGS:

Building 1201 was associated with the other Aeromedical facilities, including Buildings 1200, 1202, 1203, 1204, 1205, 1206, and 1264.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1201 retains historic integrity as far as the structure itself goes. Very little physical evidence remains of this structure's original use as an animal laboratory. The cages have been removed. Two interior walls with doors have been added. One interior wall has been removed. Service sinks, work tables, wooden bins, an incubator, and other lab support items shown on c1951 construction drawings have been removed. An area of the original roof approx. 10' x 13' was reinforced with three inches of concrete for observation deck c1952 (CE File #1201-5). A mortuary/autopsy room was added c1958. These additions may be viewed as early improvements, and do not diminish Building 1201's historic integrity. Drawings itemize a "2-body" mortuary room, an autopsy table, a band saw, cabinets, a sterilizer, a photography area, and other laboratory equipment. This equipment has been removed. This room currently serves as a lounge area for employees. Due to the important research conducted here in support of this nation's space program, further research is warranted. Recommend that Building 1201 be included in a Cold War-era Multiple Property nomination. Suggested routine maintenance: This building is showing the signs of long-term neglect. Fill the stress cracks at the exterior corners. Scrape and paint exterior walls. Replace window glass and door hardware as needed.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Continues to be situated in an isolated compound.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Original structure essentially intact. Interior lab equipment and cages removed.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Enclosed by chain link fence topped with barbed wire, along with other research facilities. Chimpanzee research continues in nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Clay tile walls still intact. Some glass block windows remain. Some glass block windows blocked in when addition constructed. Floor tiles removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Roof, walls, and exterior openings remain essentially the same. The east elevation changed due to an early addition. Interior partitions, openings, and finishes have changed.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Historic photographs show that the natural, historic, and aesthetic character of Building 1201 has been retained.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

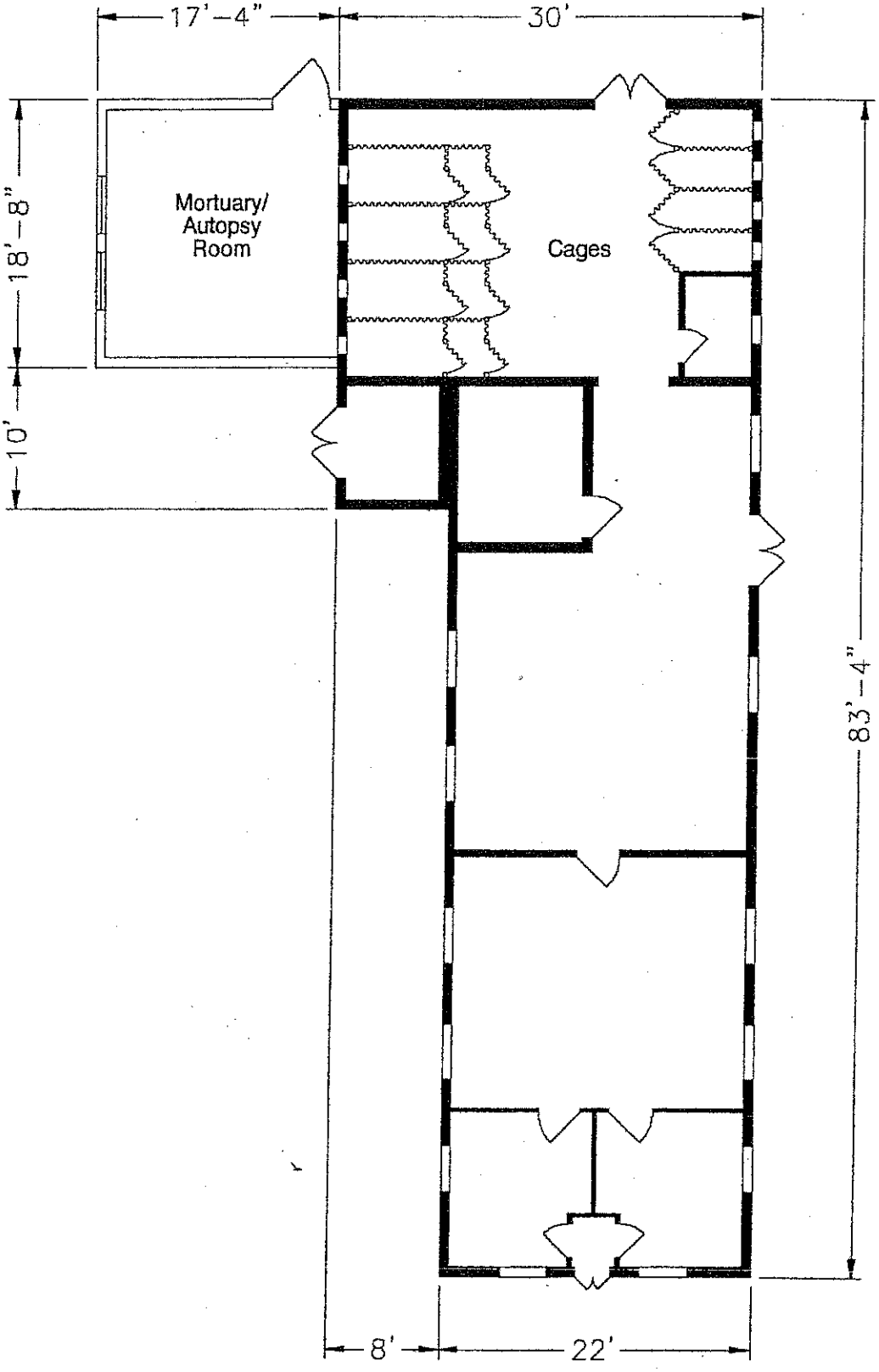
Comments: Building 1201 retains a visible link with its period of significance.

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #1-Photo #91**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1995**



280

Source: CE File #1201-1 (c1951)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1201** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Steve Merrill* New Mexico State University **Sheet 1 of 1**

INACTIVE SEPTIC SYSTEMS

Buildings 1219, 1221, 1235 and 1239
An on site inspection was completed on 20 Dec 07 with the current facilities manager, TSgt Pote, he has been the facilities manager for the past nine years. During the inspection it was discovered that there are sink holes on all leach fields in the compound. All buildings in this compound have separate drains for the bathrooms. All buildings are also currently connect to the base sewer system.
Attachment 55d shows the leach field location for Buildings 1219, 1221, 1235 and 1239.

BUILDING 1219

This building is the Administrative Offices for the Munitions Maintenance Squadron. It was constructed in 1985 and covers 4476 SF.
There are Men's and Women's Bathrooms that discharged into two (2) septic tanks prior to the installation of a sewer main that discharges to the Base Waste Water Treatment Plant.

INACTIVE SEPTIC SYSTEMS

Building 1221

This building is in the Ammo Depot and was originally constructed for ammunition storage. It was later switched to store inert munitions.
The building was constructed in 1983 and covers 2857 SF.
The facilities in the building consist of:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan (Attachment 21), Floor Plan (Attachment 22), Partial Plan (Attachment 23), Septic Tank Details and Sewage Disposal System (Attachment 24) and a Profile of Sewer Line Septic Tank and Disposal Field (Attachment 25).

INACTIVE SEPTIC SYSTEMS

BUILDING 1226

This is a munitions maintenance shop building constructed in 1985. It has 2945 SF of floor space.
Facilities installed include:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Utilities Plan (Attachment 26), Plumbing Demolition Plan (Attachment 27), Plumbing and HVAC Plan (Attachment 28) and Waster/Water Piping Detail (Attachment 29).

In Figure 8 on the following page it can clearly be seen where the leach field is in relation to where building 1226. This is the leach field for building 1219, 1221, 1235 and 1239 as well. In Attachment 46 (a map showing many of the building on Holloman AFB) it can be seen where building 1226 is in relation to these building.

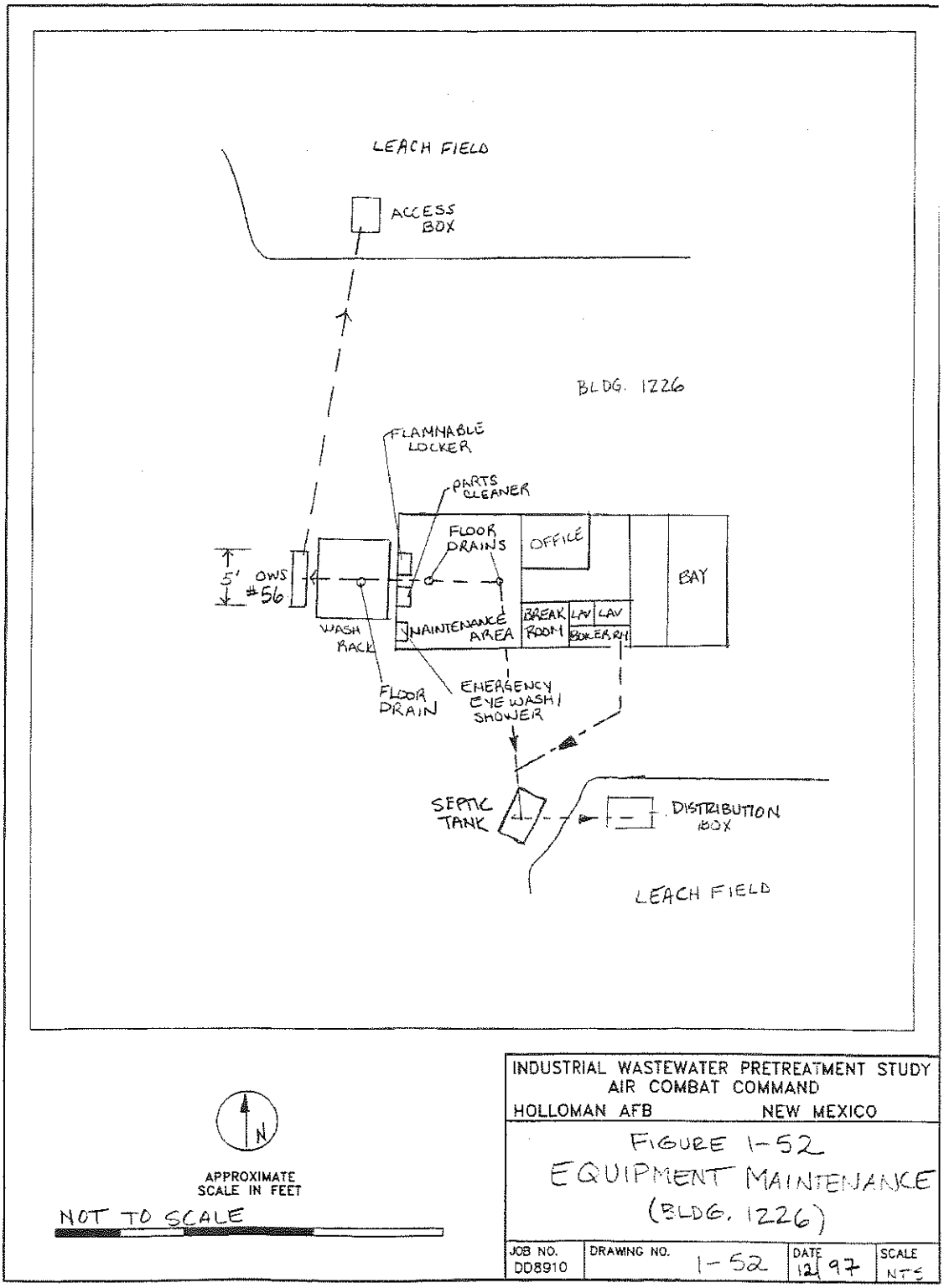


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Figure 8: Drawing of Leach field

INACTIVE SEPTIC SYSTEMS

BUILDING 1235

This building was constructed in 1964 and contains 3000 SF of floor space.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Lavatory

Along with the on site inspection mentioned earlier, a drawing for this building was also located. This drawing (Attachment 30) shows the Site Plan, Septic Tank Details and Sewer Clean Out.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST

INACTIVE SEPTIC SYSTEMS

BUILDING 1239

This is another building in the Ammo Depot. It was constructed in 1971 and contains 1920 SF.
It is in munitions maintenance service.
The facilities consist of:

- Toilet
- Urinal
- Lavatory

Along with the on site inspection mentioned earlier, drawings for this building were also located. These drawings show the Site Plan, Septic Tank Details, Utility Plan (Attachment 31), Floor Plan (Attachment 32), Grading Plan (Attachment 33) and Lavatory Detail (Attachment 34).

INACTIVE SEPTIC SYSTEMS

BUILDING 1250

This building was constructed in 1957 and contains 2890 SF.
It was originally a water pumping station. In 1985 it was changed into a storage facility. As part of the change in service the bathroom facilities were removed. Currently it has a large infestation of vectors and it is unsafe to go inside. The POC for this building is Mr. Chuck Price.
The original facilities consisted of:

- Toilet
- Lavatory
- Floor drains for the water pumps

INACTIVE SEPTIC SYSTEMS

BUILDING 1251

This building was constructed in 1965 and contains 1300 SF.
In the records it is listed as a Research and Testing Shop. It currently has a large infestation of vectors, therefore it is not safe to go inside. The building has been vacant since the mid 90's. The point of contact for this building is Mrs. Eisele.
It contains the following facilities:

- Toilet
- Lavatory

INACTIVE SEPTIC SYSTEMS

BUILDING 1269

This building was constructed in 1966 and contains 3262 SF.
The original service was a Medical Science Laboratory. It has been relegated to a storage facility.
The facilities consisted of:

- Toilet
- Lavatory
- Kitchen Sink with Garbage Disposal

Site Specific Contingency Plan: See Attachment 1

Max. Spill Quantity (gal): 55

Chemical	Container Type
Benzene	NA
Acetonitrile	

REMOVED SEPTIC SYSTEMS

No	Bldg Number	Year Completed	Dimensions	Capacity
1	1102	1952	6'x4'x8'10"	2500
2	1103	1948	7'x9'x3'2"	1412
3	1108	1958	6'x9'6"x6'3"	750
4	1119			
5	1150	1953	4'x9'x6'3"	2500
6	1154			
7	1166	1960		450
8	1175	1949	5'1"x10'4"x6'10"	2970
9	1176	1959		640
10	1265	1992		1200
11	1173			

REMOVED SEPTIC SYSTEMS

BUILDING 1102

Specifications and History: See "Cold War Survey." More information can be seen in the drawings. The drawings that have been found for this building are as follows the Grading Plan (Attachment 35), Septic Tank Details and Boring Log Results (Attachment 36), Leaching Well and Cover Details and Sewer Clean Out (Attachment 37).

Attachment 55c shows where the leach field was located for this building in 1984.

This building has the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Missile Radar Station.
Historic: Radar Triangulation: King I.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1102

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

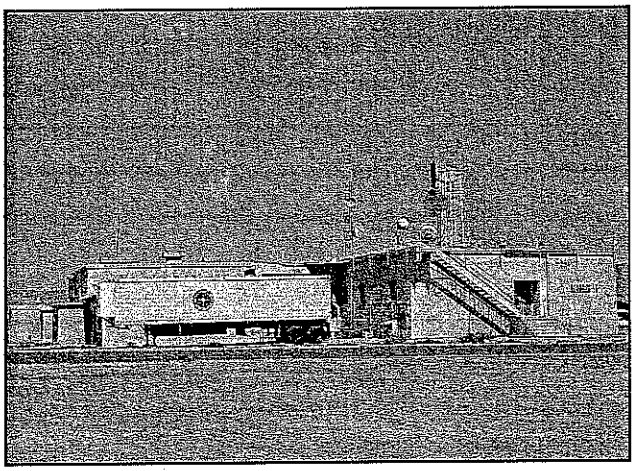
Comments: Essential structural and architectural features remain intact.

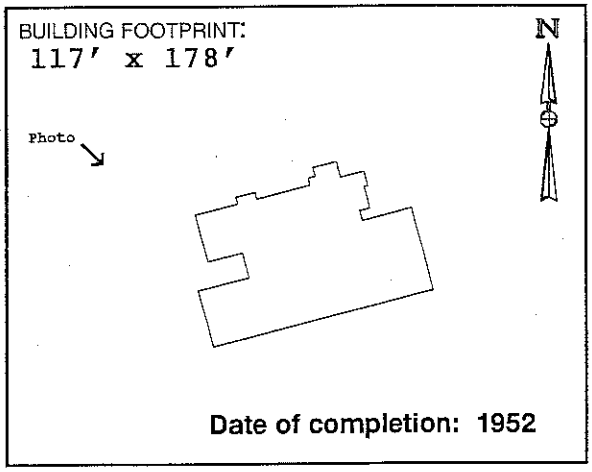
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Recommend listing as part of a Cold War Multiple Property.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1952

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1102 is a one-story concrete masonry unit, multi-shaped building with a central corridor running east-west the entire length and single rooms flanking both sides of the corridor. Original footprint shows primarily rectangular shape with a central projecting core. This core is a large open room with an upper balcony around its perimeter. Construction of the original building was completed in 1952, according to "As-built" drawings in CE File #1102-1. Surveillance display room added in 1969 (CE File #1102-1). It is unclear when north elevation additions constructed, although information in Real Property Accountable Record/1102 date the additions as being post-1970. The architect for this project was W. C. Kruger (Santa Fe, NM). The builder is unknown.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1102.

Current Function: Telemetry and Optics. Altitude measurements.

Original Function: Missile Instrumentation Station; Mission Control.

Interim Functions: Missile Radar Station.

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1102-1 (c1952).

Foundation: Concrete footing and foundation wall. Column spread footing.

Exterior walls: Concrete masonry units (CMU).

Roof: Bituminous concrete over built-up roof, ltweight concrete, supported by one-way concrete slab using concrete beams and steel beams encased in concrete.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

380

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Eligible under Criteria A and/or C at a national level of significance for important role in early Cold War-era missile and High Speed Test Track mission control and tracking. Further research recommended.

VII. ASSOCIATED BUILDINGS:

Building 1102 supported all missions at White Sands Missile Range and at Holloman Air Force Base until Building 300 and possibly 1527 at White Sands were constructed.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1102 continues to operate as a mission control building, with mostly optics and telemetry functions. The Flight and Instrument Control Room, and the Surveillance Radar rooms are vacant. Originally, missiles were fired using an analog boards (mechanical) system. When operations changed to a digital system in c1978, support moved from the central instrument control room to the north addition off of this room. Nearly all of the original interior finishes remain unchanged.

Suggested routine maintenance: Scrape, prime, and paint all block and concrete surfaces. Remove vegetation and rusted pipes by gas meter. Fill depressions at foundation, and regrade using gravel to promote positive drainage. Fill holes at concrete stoops. Replace wood bumper at dock using similar-sized lumber. Secure panel covers on abandoned electrical panels. Enclose live connections in junction boxes. Scrape, prime, and paint metal stairs. Reattach stair nose treads. Remove miscellaneous debris from building perimeter.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments: Still situated at the northeast corner of the intersection of Tula Peak Road, and Douglas Road.

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [ ] 50% to 75% intact [x] >75% intact

Comments: The original floor plan remains intact.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Continues to be situated at the intersection of two roads in an isolated setting with few nearby buildings.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: Most all original materials have been retained at both the exterior and the interior.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Comments: All original exterior and interior room finishes remain visible. At the south elevation, one window is blocked, one window has been replaced with a door, and the door at the loading dock has been replaced. Most of the north elevation is obscured by the addition of an operations room.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1102 continues to support limited mission control operations.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

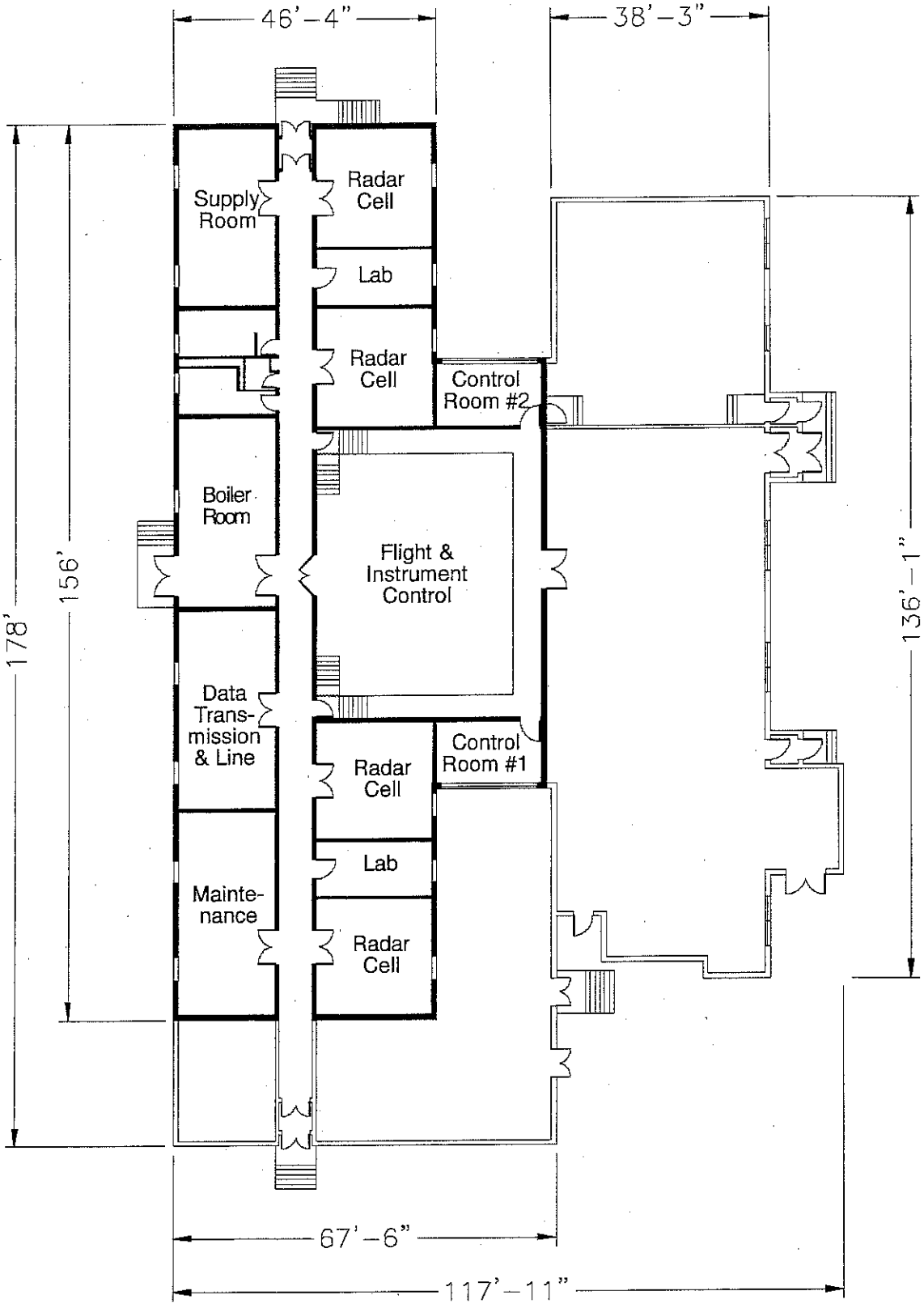
Comments: Building 1102 retains an evident link with its aesthetic and functional historic character.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #49**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1102-1 (c1952)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1102** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-6401* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1103

Specifications and History: See "Cold War Survey" the Layout Plan (Attachment 38) has also been provided.

Attachment 55c shows where the leach field was located for this building in 1984.

Facilities: This building contains the following facilities.

- Tiolets-2
- Urinals-2
- Lavatories-3
- Service Sinks-3

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Timing.
Historic: Telemetering Building.
Reference: HAFB Map Sheet 4 of 12 (H-23.5).

Building Number: 1103

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: In need of routine maintenance only.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

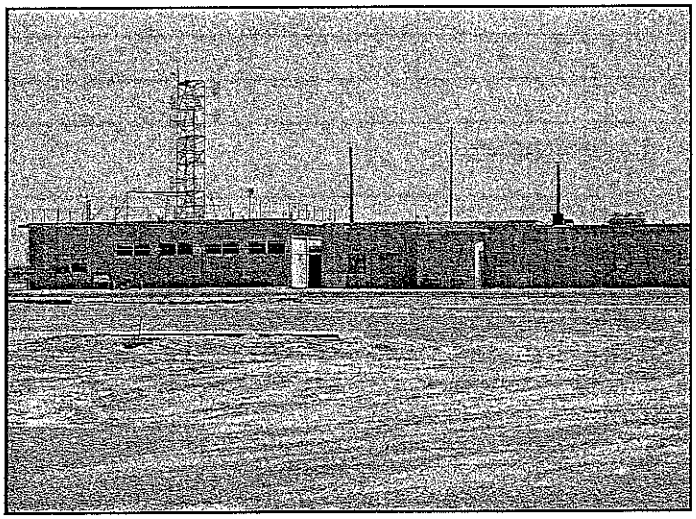
Comments: Few alterations since early improvements.

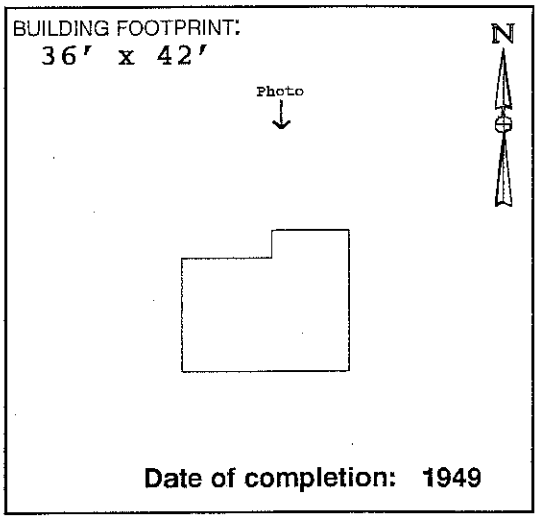
Preliminary Determination of National or State Register Eligibility:

[ ] Exceptional importance [ ] Potentially eligible [x] Further research recommended [ ] Ineligible

Comments: Research recommended to determine historic use. See Section VIII.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: 1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1103 is a one-story rectangular building with concrete masonry unit walls, and a flat roof. The original building was completed in 1949, according to "As-built" drawings located in CE File #1103-1. This original construction is centrally located, flanked to the east and west by subsequent additions. Real Property Accountable Record/1103 documents the addition of 2,930 square feet to the original building with the notation "Subsequent Improvements thru May 57." One or both additions to the original building may therefore be considered to be subsequent improvements, rather than additions that compromise historic integrity. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE: (Personal communication with Building 1103 personnel)

Current Function: (East end) Leased by WSMR to transmit mission timings.

Current Function: (West end) Unknown.

Original Function: Telemetering station for data collection of Range missions.

Interim Functions: Real Property Accountable Record/1103: "Communications CTR" (c1962); "Telecom Cen" (c1971); "Comm Fclty" (c1980); "Elec Rsch Rdr" (c1988).

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1103-2 (1967); CE File #1103-1 (1949).

Foundation: Concrete wall footing.

Exterior walls: Painted concrete masonry units (CMU).

Roof: Built-up roof on wood sheathing and 2 x 8 wood joists.

Notable interior features, including machinery: None noted.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

Although perhaps not meeting the "exceptional importance" stipulation imposed on buildings constructed within the last fifty years, Building 1103 may be eligbile for the National Register under Criterion A at a regional or national level in the year 1999. If further research determines that Building 1103 is not eligible as an individual property, consideration should be given to its eligibility as a contributing feature in a Cold War Multiple Property submission for its support of early Cold War-era test launches.

VII. ASSOCIATED BUILDINGS:

Building 1103 was associated during its historic period of significance with Building 1102, mobile data collection vans, and Building 300 at White Sands Missile Range.

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1103 appears very different today from depictions on "As-built" drawings dated 1949. It is unclear whether additions to the east and west ends of the original building represent early improvements to the original building, or whether these additions represent later construction that has compromised the historic integrity of the original building. Information obtained from Real Property Record/1103 and field visits seems to indicate that the additions represent early improvements to the original building. If so, Building 1103 retains historic integrity. Further research is needed to verify the construction sequence, and to verify what early Cold War-era research activities were supported by Building 1103. Currently, Building 1103 is leased by the White Sands Missile Range. Aside from minor partitioning at the telemetering room, the original floor plan of the original building shows no alterations. Wood posts (6 x 6) that appear on original drawings to support the roof girders have been removed.

Suggested routine maintenance: Repair, or replace in kind, the exterior wood architectural features, including the soffit, fascia, wood doors, and louvers. Patch spalling concrete at foundation. Remove vegetation at roof.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [x] 25% to 50% intact [ ] 50% to 75% intact [ ] >75% intact

Comments: Original telemetering room is now used as spare equipment storage.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [x] Retains most [ ] Retains all or nearly all of its cultural setting

Comments: Earlier location plans indicate three utility buildings situated in a row next to Building 1103 to the east. These buildings have been removed. Continues to be set in a somewhat isolated setting, in the vicinity of King-I.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Comments: Unable to access some rooms. Those rooms that were accessed, however, appear to have most of the original materials intact. A brick chimney and a metal stack have been removed.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [x] 50% to 75% [ ] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original windows at north elevation have been covered up at the interior. The telemetering room has been partitioned (reversible).

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [x] Some elements remain [ ] Retains integrity

Comments: Building 1103 personnel are actively engaged in serving as a timing link for White Sands Missile Range tests.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

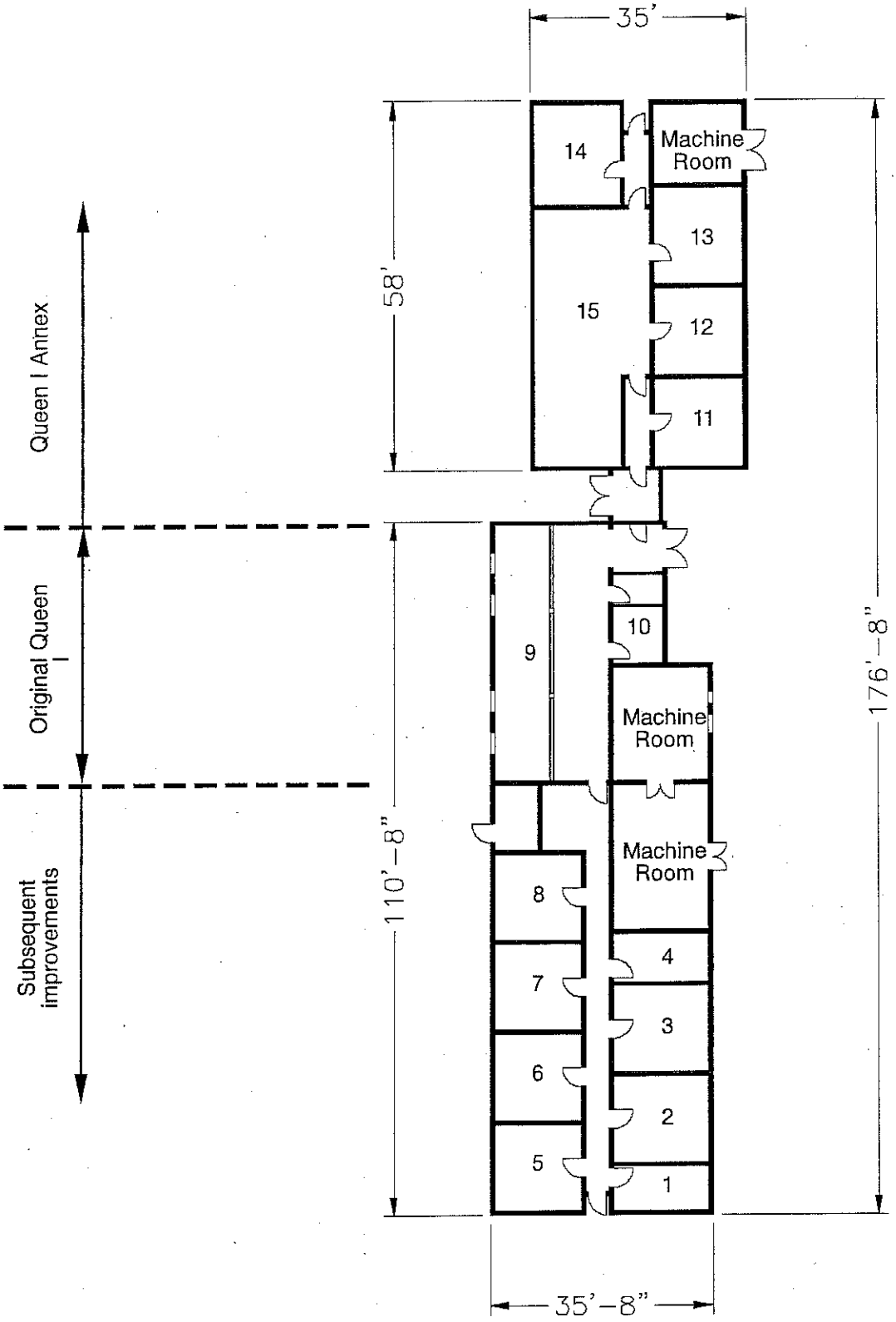
Comments: Building 1103 continues to provide support to the White Sands Missile Range.

X. FURTHER INFORMATION:

Surveyed By:

Sonya Cooper
Jean Fulton
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #47**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: Dynalectron *Facilities Handbook*, c1964.

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1103** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1108

This building was constructed in 1958 and contains 2626 SF of floor space.
The building was originally built to serve as the telephone exchange. In 1980 it was retitled as a communications facility.
The building contains the following facilities:

- Toilet
- Lavatory
- Janitorial Sink

The drawings provided (Attachment 39-40) show a Utility Plot Plan, Septic Tank Details, Sewer Clean Out, Toilet Room Details and Plan Details.

Attachment 55e shows where the leach field was located for this building in 1984.

Site Specific Contingency Plan: See Attachment 1 and 2

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate into local area on ground

Tank location: North of facility

Fuel Flow - North

Substance	Vol/No of Tanks/Type
MOGAS	500 gal each/ 1 /AST
MOGAS	250 gal each/ 2 /AST

REMOVED SEPTIC SYSTEMS

BUILDING 1119

This is an Army owned building that contains 2224 SF of floor space. Use and maintenance of the building was transferred to the Air Force in 2005. Prior to the Air Force taking possession the Army had delegated the building to the GSA for use as a vehicle maintenance shop. Once the Air Force took over, the building changed service to an electrical shop and storage facility.

Site Specific Contingency Plan: See Attachment 1

Secondary Containment Route: Tanks diked with earthen material

Probable Spill Route: Leaks dissipate into local area on ground

Substance	Vol/No of Tanks/Type
Diesel	250 gal ea/ 3 /AST
MOGAS	250 gal ea/ 2 /AST
Diesel	750 gal ea/ 3 /AST

Figure 9: Picture of Bldg 1119

REMOVED SEPTIC SYSTEMS

BUILDING 1150

This is also an Army owned building and therefore details are lacking from Holloman's records. The building has 2844 SF.
The original service is unknown, but since the Air Force started using the building it has been used as storage space.
It contains the following facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 9: Drawing of Bldg 1150

REMOVED SEPTIC SYSTEMS

BUILDING 1154

This is an Army owned building and there is no information in Holloman's files pertaining to this building.

Attachment 55c shows where the leach field was located for this building in 1984.

REMOVED SEPTIC SYSTEMS

BUILDING 1166

This building was constructed in 1960 and contains 4955 SF. The structure is a Test Track Shop/Storage Building known as the "Break Setter Building".
The facilities include:

- Toilets-2
- Urinal
- Lavatory
- Shower

Attachment 41 is a drawing showing the sewer layout and the septic tank details.

Attachment 55c shows where the leach field was located for this building in 1984.

Site Specific Contingency Action: See Attachment 3

Secondary Containment Route: None

Probable Spill Route: Leaks dissipate in local area on ground; if full tank or drum spilled' the substance may reach open ditch.

Material Compatibility: No material incompatibilities

Chemical	Container Type
Oil/Water Separator Waste	500 gal/ 1 / UST

Figure 10: Picture of Bldg. 1166

REMOVED SEPTIC SYSTEMS

BUILDING 1175

Specifications and History: See "Cold War Survey"
Facilities:

- Toilet
- Urinal
- Lavatory
- Janitorial Sink

In Attachments 42-44 a trench pit, the toilet room details, the trench junction to UPS, the sanitary sewer manhole and water and sewer piping can be found for Bldg 1175.

Attachment 55c shows where the leach field was located for this building in 1984.

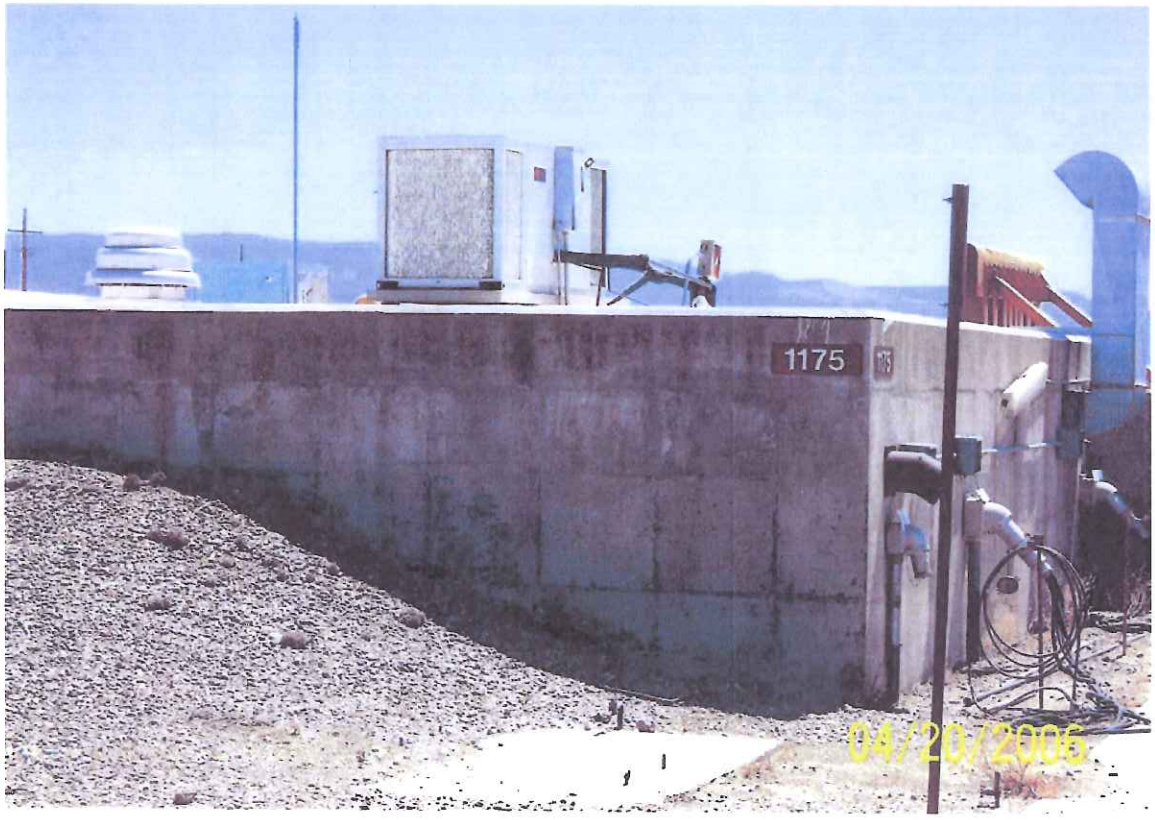


Figure 11: Picture of Bldg 1175

COLD WAR SURVEY: HOLLOMAN AIR FORCE BASE

NAME:
Current: Blockhouse--"Alpha".
Historic: Blockhouse--"Alpha".
Street Address: 1656 Test Track Rd., HAFB, 88330-7848.

Building Number: 1175

I. GENERAL INFORMATION:

Current Condition: [ ] Intact [x] Needs maintenance [ ] Deteriorated [ ] Archaeological

Comments: Building 1175 is in need of minor routine maintenance.

Degree of Alteration: [ ] None [x] Minor [ ] Moderate [ ] Major

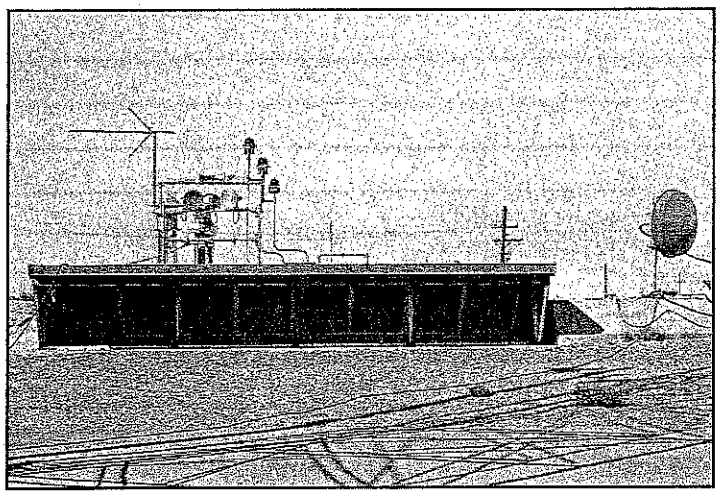
Comments: Modernization at interior to enable continued Test Track use.

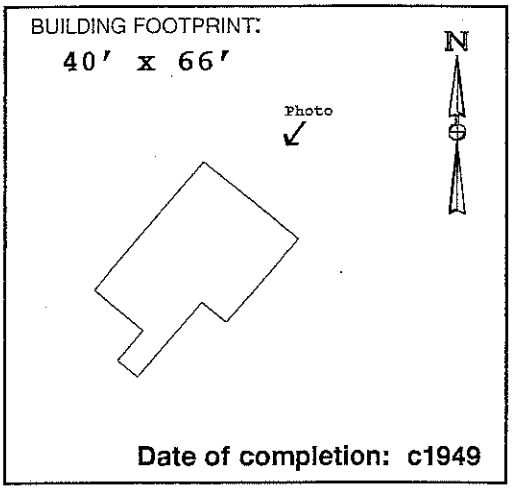
Preliminary Determination of National or State Register Eligibility:

[x] Exceptional importance [ ] Potentially eligible [ ] Further research recommended [ ] Ineligible

Comments: Eligible for the National Register under Criteria A and/or C.

Contact: Martyn Tagg, Archaeologist, 49 CES/CEV, 550 Tabosa Avenue, HAFB, NM 88330-8458.





Date of completion: c1949

II. ARCHITECTURAL DESCRIPTION:

(Give a visual description of the building. Include date of construction, whether actual or an estimate, and a discussion of any structural modifications to the building. List architect and builder, if known. Cite sources of information.)

Building 1175 is an irregularly shaped, one-story concrete structure, built mostly below grade. The building is accessed by a ramp leading down to double doors at the southwest elevation. These doors access the original launch control room constructed in c1949. This entrance, three entrances off of the ramp, and windows facing the track (northeast) are the only visible openings. A 15′ x 32′-6″ addition was constructed at the northwest elevation in 1960 (CE File #1175-2). Another addition, adjacent to northwest side of ramp was completed in 1981 (CE File #1175-3). The ramp extension was also constructed at this time. Neither the architect nor the builder is known.

III. HISTORIC AND CURRENT USE:

Source: Real Property Accountable Record/1175; CE File #1175-1 (c1949).

Current Function: Launch control facility, High Speed Test Track.

Original Function: Launch control facility, High Speed Test Track.

Interim Functions:

IV. ORIGINAL ARCHITECTURAL AND STRUCTURAL FEATURES (IF KNOWN):

Source: CE File #1175-1 (c1949); CE File #1175 (c1980).

Foundation: Concrete footings.

Exterior walls: Reinforced concrete.

Roof: 3-foot thick reinforced concrete.

Notable interior features, including machinery:
A long row of thick blast-proof windows faces the track to the northeast.

V. CURRENT FEATURES IF DIFFERENT FROM ORIGINAL:

Source: Field visit Spring 1996.

Foundation:

Exterior walls:

Roof:

Notable interior features, including machinery: None noted.

366

VI. BRIEF STATEMENT OF HISTORIC SIGNIFICANCE:

"Alpha" Block house Building 1175 is one of the original High Speed Test Track support facilities, constructed c1949 to provide launch control. Recommend that Building 1175 be nominated under Criteria A and C as part of a basewide early Cold War Multiple Property listing.

VII. ASSOCIATED BUILDINGS:

Building 1175 operated, and continues to operate, in support of the high speed test track launching activities, along with Buildings 1162, 1163, 1161, 1645, and the Horizontal Test Stand facility (Buildings 1159 and 1160).

VIII. ADDITIONAL COMMENTS AND MAINTENANCE RECOMMENDATIONS:

Building 1175 retains historic integrity. Due to its national level of significance under Criteria A and C, recommend that Building 1175 be listed along with the other test track support buildings as part of a Multiple Property nomination to the National Register of Historic Places.

Subsequent improvements to the original Building 1175 augmented the original design and function as a launch control facility for important research conducted at the high speed test track. The interior was renovated in 1984 (CE File #1175-4). Although this renovation obscures original interior finishes, Building 1175 as a whole retains historic integrity of location, design, setting, workmanship, materials, feeling, and association. Of interest to future researchers may be the dramatic changes in computer technology which have occurred since the construction of Alpha Blockhouse: Computers which at that time required several rooms to house, now occupy considerably less space. Launch control operations continue at Alpha Blockhouse, although rooms designed to hold early equipment are virtually empty.

Suggested routine maintenance: Repair bond beam where steel is exposed. Remove vegetation at exterior embankments. Remove debris at front walkway.

IX. ASSESSMENT OF HISTORIC INTEGRITY:

Location: Has any or all of the structure been moved from its original construction site?

[ ] Unable to determine [ ] Portions of the structure have been moved [x] Entire structure located at original site.

Comments:

Design: What percentage of the elements (structural, technological, architectural and decorative) remain intact?

[ ] Unable to determine [ ] <25% intact [ ] 25% to 50% intact [x] 50% to 75% intact [ ] >75% intact

Comments: Subsequent improvements to the original floor plan added to Building 1175's design and function as a launch control facility.

Setting: To what extent has the natural setting (i.e., topography, viewshed, and vegetation) been maintained?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its natural setting

To what extent does the cultural setting remain, including surrounding patterns of land use, and associated buildings?

[ ] Unable to determine [ ] Retains very little [ ] Retains most [x] Retains all or nearly all of its cultural setting

Comments: Except for the construction of smaller buildings in the vicinity, the original setting of Building 1175 near the test track launch pad has been retained.

Materials: To what extent have the original materials used to construct this structure been retained?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: The raised wood floor in the console room has been removed. The original light fixtures have been removed. One wood and glass partition has been removed. Sheetrock® walls, carpeting, wainscot, and linoleum have been added to the control room.

Workmanship: To what degree does the original structural and decorative craftsmanship remain visible?

Exterior: [ ] Unable to determine [ ] <25% [ ] 25% to 50% [ ] 50% to 75% [x] >75%

Interior: [ ] Unable to determine [ ] <25% [x] 25% to 50% [ ] 50% to 75% [ ] >75%

Comments: Original workmanship at the northeast elevation, and at the entrances at the ramp is still visible. Interior renovations hide the original architectural craftsmanship.

Feeling: To what extent does the building or structure retain its original natural, historic, and aesthetic character?

[ ] Unable to determine [ ] Little or no integrity of feeling remains [ ] Some elements remain [x] Retains integrity

Comments: Building 1175 continues to function as a launch control facility for the High Speed Test Track.

Association: Does this building or structure appear to retain a visible link with its historic period of significance?

[ ] Unable to determine [ ] Little or no integrity remains [ ] Some elements remain [x] Retains integrity

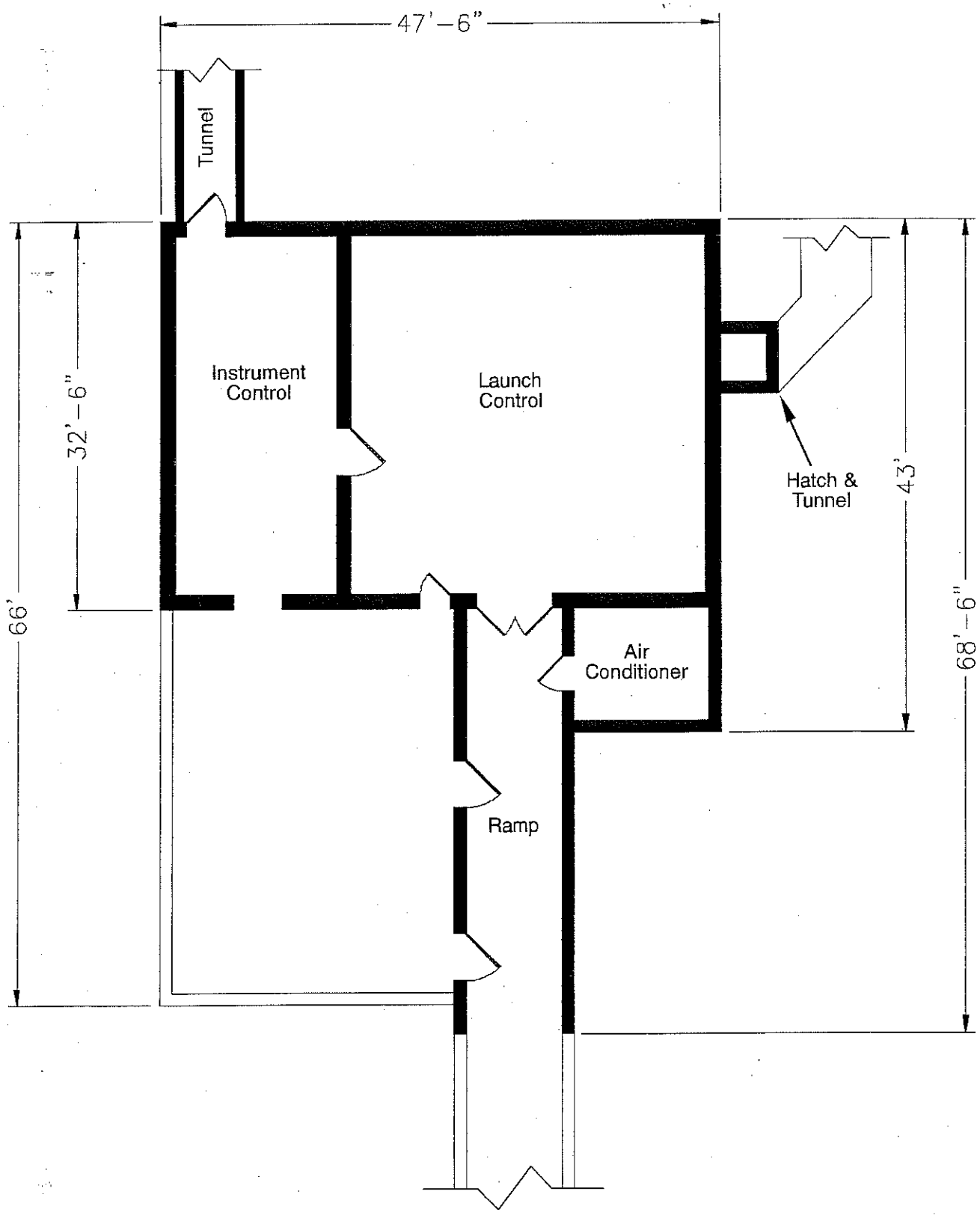
Comments:

X. FURTHER INFORMATION:

Surveyed By:

Jean Fulton
Sonya Cooper
2500 Jordan Road
Las Cruces, NM 88001

HAFB Report Number: **CRM Publication #3**
Photograph Citation: **CD-ROM #2-Photo #35**
Negatives On File: **49 CES/CEV, 550 Tabosa Ave, HAFB**
Date of Field Visit: **SPRING 1996**



Source: CE File #1175 (c1980)

State of New Mexico Office of Cultural Affairs Historic Preservation Division	**BUILDING 1175** Holloman Air Force Base Alamogordo, New Mexico	Project No. 35-95-HAFB-4	AutoCAD rendering by: *Eugene N. Kilmer* *(505) 323-0641* Mag Drafting **Sheet 1 of 1**

REMOVED SEPTIC SYSTEMS

BUILDING 1176

This building was constructed in 1959 and contains 3850 SF.
The building is located at the Test Track and is known as the Sled Launch Shop.
Facilities include:

- Toilet
- Lavatory
- Shower

In Attachments 45-48 a plumbing plan, new drain pit, utility plan, sewer clean out, utilities contour plan and septic tank details can be found for Bldg 1176.

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 12: Picture of Bldg 1176

REMOVED SEPTIC SYSTEMS

BUILDING 1173

This building was constructed in 1957 and contains 17,428 SF.
The building is the main office building at the Test Track.
It contains the following facilities:

- Toilets-8
- Urinals-4
- Lavatories-9
- Janitorial Sinks-2

Attachment 55c shows where the leach field was located for this building in 1984.

Figure 13: Picture of Bldg 1173

REMOVED SEPTIC SYSTEMS

BUILDING 1265

This building was constructed in 1957 and covers 43,388 SF.
This is the Inertial Guidance Facility, previously known as the Guided Weapons Lab.
The building contains the following facilities:

- Toilets-12
- Urinals-6
- Lavatories-12
- Janitorial Sinks-5

This building has been attached to the sewer system at Holloman AFB since before 1984.

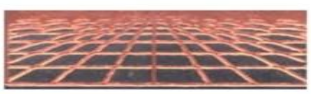
In Attachments 49-53 a Water Piping Diagram, Partial Plumbing Plan, Floor Plan, Building, Pavement and Utilities Layout, Sewer Clean Out, and Enlarged Plan can be found for Bldg 1265.

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-070

Appendix B
Geophysical Report

ULS SERVICES CORPORATION

GEOMARKOUT LOCATING Co a tradename



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---------- *A Veteran Owned Small Business* ----------

5 July 2012

Christopher Long, P.G.
Scientist
Federal Services
Shaw Environmental, Inc.
1401 Enclave Parkway, Suite 250
Houston, TX 77077

Subject: Field Documentation Report for Geophysical Services -
Location of Utilities and Underground Features Associated
With Former UST and Septic System Sites,
Holloman AFB, NEW MEXICO (SHAW PO 783916-000 OP)

Gentlemen:

This report documents the recent Geophysical Survey field work ULS Services Corp completed at the subject site On and between the dates of 11 June 2012 thru 23 June 2012.

SHAW / ULS SERVICES CORP
GEOPHYSCIAL SERVICES
FORMER UST AND SEPTIC SYSTEM SITES
5 JULY 2012

SCOPE OF WORK

Scope of this work is includes geophysical services at approximately 29 Former UST or Septic Systems sites located across Holloman AFB that have reportedly undergone past abandonment in place or excavation activities. Geophysical services are employed in an attempt to locate potential USTs, former UST excavation areas, abandoned septic tanks or excavations and associated leach field areas. Location of underground utilities near these observed features is included. Observations are marked out in field and electronically mapped with GPS data collection and GIS presentation. Survey of each site is approximately 25 by 25 to 100 by 100 feet in size.

METHODS

Methods utilized in performance of this work include: Visual Inspection, Analog Real - Time Electromagnetic Induction Conductivity Detection (EMICD), Magnetic Locating (MGL), Ground Penetrating Radar (GPR), and EM Pipe and Cable Location (EMPCL). A sub-meter WAAS GPS receiver with automatic real -time differential correction and ESRI Arcpad software is utilized to collect observation data. ESRI Arc View 10 GIS software is utilized for mapping presentation.

EMIMD ground induction methods are employed to detect both 1) broad metal mass anomalies (Rectangular Surface Projections) or conductive zones that may be indicative of potential USTs – Septic tanks, conductive metal debris, steel reinforced concrete, UST's, building hosts, piping, building demo materials, drums, sumps or other unknown burial materials; and 2) to detect relative lateral changes in conductive zones of soil or backfill materials relative to native soils. Former UST excavations and septic -leachate material may potentially have a higher conductive response or well drained leachate fill materials associated with septic systems may in some cases exhibit a relatively lower or quiet conductive response relative to surrounding higher conductive soil response. A two-way Cartesian grid pattern of five by five feet is walked within the search area (site). Observations are real time and marked on ground surface with paint and pin flagging. Observations are collected with a sub- meter GPS with automatic differential correction and plotted approximately onto web based imagery.

GPR is utilized to detect and potentially observe former UST excavation sidewalls as well as septic – leach field pit sidewall and fill areas. GPR is also utilized to compliment the EM Pipe and Cable utility survey work by potentially locating conductive as well as non-conductive utilities.

A EM Pipe and Cable Survey is conducted at each site by performing ambient passive live power and communication line sweeps, active ground induction sweeps, and active direct- connect or induction- clamp sweeps using existing conducts or pipes visibly nearby. Multiple active frequencies are utilized for best Detection. Utilities are identified where possible and marked unknown if not identified.

All observations are marked with hi-visibility orange-red marking paint. Some Ares are hi-lighted with black paint due to light soil conditions. GPR boundaries indicating potential septic tank and leach field areas are outlined with black paint. Pin flags are also utilized to mark these boundaries in soft soil and weed areas.

OBSERVATIONS

Site Description

The Project Site (Holloman AFB - Former UST and Septic Systems) is comprised of approximately 29 different environmental site locations (heir in referred to as Sites) . Each sites includes and varies in description from existing active building locations to in-active remote abandoned to former building areas where USTs or Septic systems were utilized in the past. Each Site is fairly flat with sandy to gravelly surface conditions. Some sites include native brush and weeds. Sites near active building areas include asphalt or concrete surfaces, sidewalks and planter areas. ULS field staff helped review historical documentation available of each site in the field. Where available, drawings and photographs were reviewed. When available, reported GPS coordinates from reports, of septic tank locations, were utilized by SHAW field staff to navigate to septic tank location to aid focus search area.

Generally there are no surface indications of USTS or Septic tanks, however some limited features exist at some sites and include potential vent riser pipes and asphalt patching, settling areas, and conidial – rectangular cracks in concrete. Surface indications of septic systems at some sites include potential inactive clean- outs pipes near building and nearby existing upgraded sewer man-hole systems that have been connected to the existing Base sewer collection system. Some septic system sites have open holes , surface erosion, and associated potential underground voids observed near the inactive cleanouts and suspected septic search area.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

General ambient or background EM conditions at this site are categorized as being high or noisy most likely resulting from caliche or saline soil conditions throughout the area. These conditions all result in a high ambient background EMICD response that are difficult to filter out, however, subtle to distinct lateral changes are observed potentially marking position of former UST excavations. Magnetic locator is not affected by saline conditions. GPR response in these conditions is poor to somewhat fair, however, subtle, trends in GPR observations exhibit dipping or high angle (from horizontal) refraction bands indicating potential soil side-wall trends allowing for location of approximate former excavations. The use of EMICD and GPR data in conjunction with historical information and physical observations are all utilized to mark the approximate location of potential former USTs in the field as shown on the GIS imagery maps.

General EM - MAG and GPR Instrument Survey Results

Former UST Sites

Similar response is observed near former septic systems. Most all septic tanks are reported to have been abandoned in place or partly crushed in place. Magnetic locator surveys revealed concentrated areas of metal response (metal anomalies) likely from metal plates and rebar in septic tanks in areas near former sewer clean-outs and next to reported septic tank locations where latitude and longitude data is available. EM Induction and GPR transects over these metal anomalies further corroborated these findings. EM Induction survey results near the effluent (down gradient) side of metal anomalies (potential septic tanks) resulted in observation of relatively moderately higher lateral response to zones of low to quiet lateral response zones near the septic tanks relative to the ambient response in surrounding area. GPR data across these zones exhibited very subtle side-wall trends that appear to corroborate with EMICD findings. The use of EMICD and GPR data in conjunction with historical information and physical observations of cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs in the field and as shown on the GIS imagery maps.

CONCLUSIONS and LIMITATIONS

The use of EMICD and GPR data in conjunction with historical information and physical observations of reported building location, vent riser location, boiler room location, existing and abandoned sewer cleanouts, soil erosion, voids and vegetation change are all utilized to mark the approximate location of potential former USTs , Septic tanks and leach fields. Ambient soil conductivity at this site is very high and EM and GPR data observed is very subtle. Field trends are used to mark the approximate location of potential targets.

As in any type of survey or investigation to determine characteristics below grade, careful exploratory excavation or drilling may be needed to further help determine a more accurate determination of the subsurface. Use of hand tools and air knifing is also useful to help as a safety measure. Base one- call utilities, as well as, private 811 one –call should be consulted and recalled as necessary.

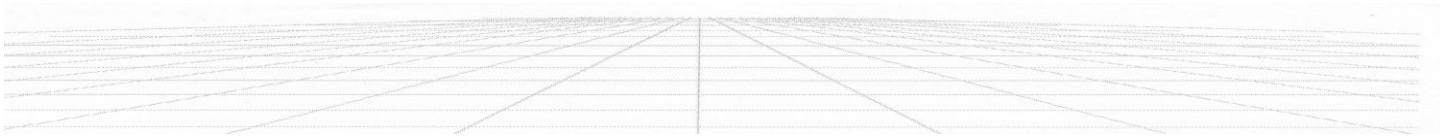
If you have any questions regarding this report please contact me at (206) 384- 2857.

Sincerely,

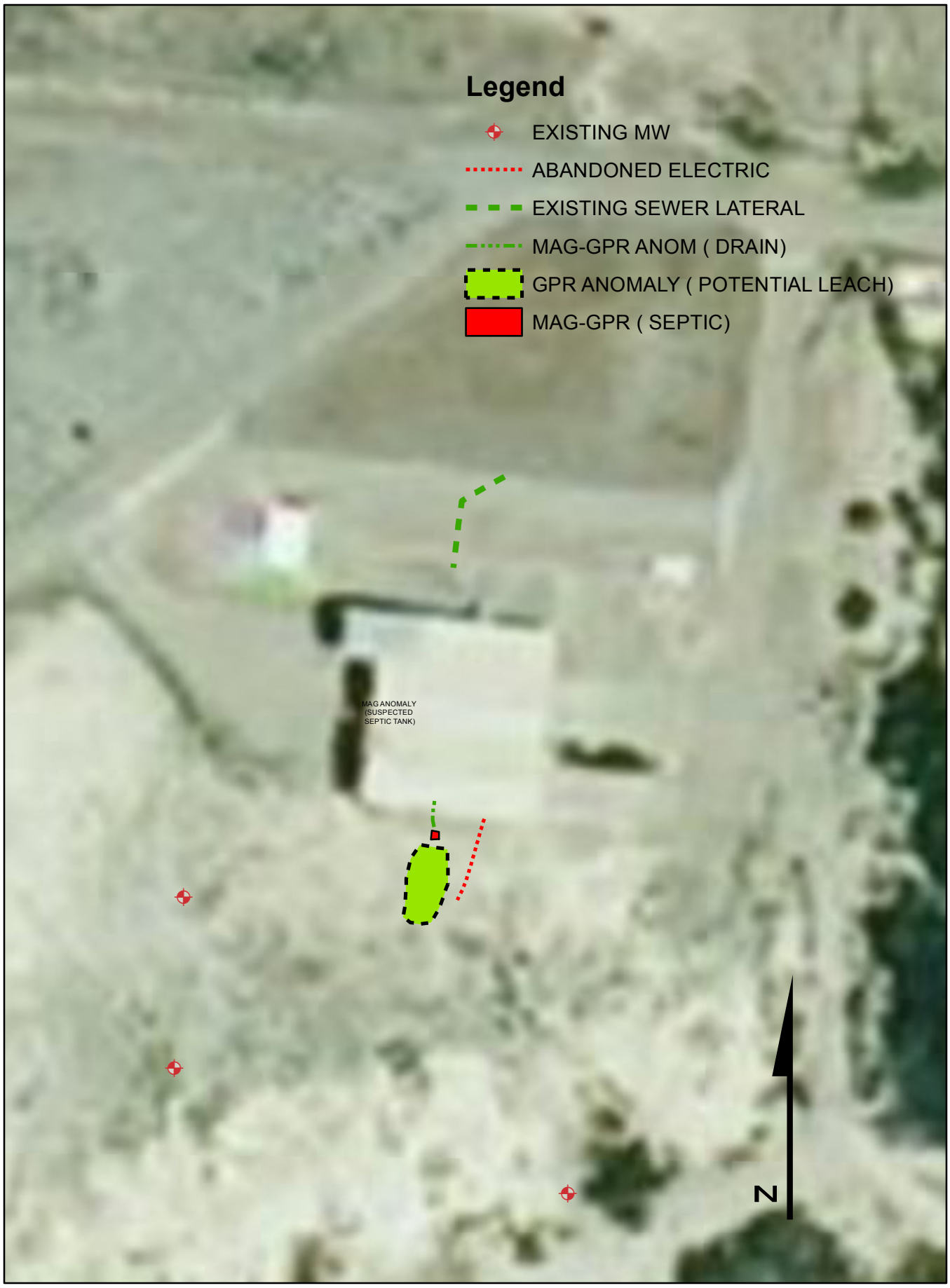
ULS SERVICES CORPORATION
Geomarkout tradename

Michael W. Benedict
Site Representative

Admin Office/Billing: PO Box 724 Pocatello, Idaho 83204
(208) 234-1441 Fax (208) 234-1507 1 800 301-4420
Seattle / Portland / SAC / Alaska / HWI – AS - GUAM Operations
1 - (866) 804- 5734 / San Diego – LA / Operations 1 - (800) 528-8206



tBLDG 1176 POTENTIAL SEPTIC SYSTEM
HOLLOMAN AFB



WGS_1984_UTM_Zone_13N
ULS SERVICES CORP
mwb 20 June 2012

0 15 30 60 90 120
Feet

Appendix C
Sample Collection Logs

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

* STATION 1

Location Code **OTC544**

RFA / COC Number 144106 - HOII

Sample Number **OTC544-IS-0001-~~MMDDYY~~** 070612

Task

Sample Name **OTC544-z-OTC544-IS-0001-MMDDYY-z**

Collection Date 070612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 0915

Sample Purpose ~~Unknown~~ invest.

Start Depth 3'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

End Depth 5'

Sampling Equip Geoprobe

Sample Matrix **SOIL**

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase Hill 7/6/12

Reviewed By / Dat _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager Christopher Long

* STATION 1

Location Code OTC544

RFA / COC Number 144106 - H011

Sample Number OTC544-IS-0002-~~MMDDYY~~ 070612

Task

Sample Name OTC544-z-OTC544-IS-0002-MMDDYY-z

Collection Date 070612

Sampling Method ~~Unknown~~ DPT Invest.

Sample Type ~~Unknown~~ Grab

Collection Time 0945

Sample Purpose ~~Unknown~~

Start Depth 10'

End Depth 12'

QC Code NORMAL ENVIRONMENTAL SAMPL

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase Hill 7/6/12

Reviewed By / Dat _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

* STATION 2

Location Code **OTC544**

RFA / COC Number 1H4106 - H011

Sample Number **OTC544-IS-0003-~~MMDDYY~~** 070612

Task

Sample Name **OTC544-z-OTC544-IS-0003-MMDDYY-z**

Collection Date 070612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1010

Sample Purpose ~~Unknown~~ invest.

Start Depth 7'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

End Depth 9'

Sampling Equip Geoprobe

Sample Matrix **SOIL**

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	I(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase Hill 7/6/12

Reviewed By / Dat _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

* STATION 2

Location Code **OTC544**

RFA / COC Number 144106 - H011

Sample Number **OTC544-IS-0004-~~MMDDYY~~** 070612

Task

Sample Name **OTC544-z-OTC544-IS-0004-MMDDYY-z**

Collection Date 070612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1020

Sample Purpose ~~Unknown~~ Invest.

Start Depth 14'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

End Depth 16'

Sampling Equip Geoprobe

Sample Matrix **SOIL**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Hill 9/6/12 *Reviewed By / Dat* _____

Sample Collection Log

- Holloman AFB

Manager **Christopher Long**

* STATION 3

Location Code **OTC544**

RFA / COC Number 144106 - H011

Sample Number **OTC544-IS-0005-~~MMDDYY~~** 070612

Task

Sample Name **OTC544-z-OTC544-IS-0005-MMDDYY-z**

Collection Date 070612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1040

Sample Purpose ~~Unknown~~ invest.

Start Depth 3'

End Depth 5'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sampling Equip Geoprobe

Sample Matrix **SOIL**

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Logged By / Dat Chase Hill 7/6/12

Reviewed By / Dat _____

Sample Collection Log

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Manager Christopher Long

* STATION 3

Location Code OTC544 RFA / COC Number 144106-H011

Sample Number OTC544-IS-0006-~~MMDDYY~~ 070612 Task

Sample Name OTC544-z-OTC544-IS-0006-MMDDYY-z Collection Date 070612

Sampling Method ~~Unknown~~ DPT Invest. Sample Type ~~Unknown~~ Grab Collection Time 1055

Sample Purpose ~~Unknown~~ Start Depth 10'

QC Code NORMAL ENVIRONMENTAL SAMPL End Depth 12'

Sampling Equip Geoprobe Sample Matrix SOIL

QC Partners:

(TB) _____ (EB) _____ (FB) _____ SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw Logged By / Dat Chase Hill 7/6/12 Reviewed By / Dat _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

* STATION 4

Manager **Christopher Long**

Location Code **OTC544** *RFA / COC Number* 144106-H011

Sample Number **OTC544-IS-0007-~~MMDDYY~~** 070612 *Task*

Sample Name **OTC544-z-OTC544-IS-0007-MMDDYY-z** *Collection Date* 070612

Sampling Method ~~Unknown~~ DPT Invest. *Sample Type* ~~Unknown~~ Grab *Collection Time* 1110

Sample Purpose ~~Unknown~~ *Start Depth* 3'

QC Code **NORMAL ENVIRONMENTAL SAMPL** *End Depth* 5'

Sampling Equip Geoprobe *Sample Matrix* **SOIL**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____ *SampleTeam* CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	)(2) + MeOI
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments: _____

Sketch Location:

Shaw EMS *Logged By / Dat* Chan 7/6/12 *Reviewed By / Dat* _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager Christopher Long

* STATION 4

Location Code FIELDQC

RFA / COC Number 144106 - Holl

Sample Number OTC544-IS-0008-~~MMDDYY~~070612-FD

Task

Sample Name FIELDQC-z-OTC544-IS-0008-MMDDYY-FD-z

Collection Date 070612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1110

Sample Purpose ~~Unknown~~ Field QC

Start Depth 3'

End Depth 5'

QC Code FIELD DUPLICATE

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	)(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chase Hill 7/6/12

Reviewed By / Dat

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager Christopher Long

STATION 4

Location Code OTC544

RFA / COC Number 144106 - H011

Sample Number OTC544-IS-0009-~~MMDDYY~~ 070612

Task

Sample Name OTC544-z-OTC544-IS-0009-MMDDYY-z

Collection Date 070612

Sampling Method ~~Unknown~~ PPT

Sample Type ~~Unknown~~ Grab

Collection Time 1130

Sample Purpose ~~Unknown~~ Invest.

Start Depth 10'

QC Code NORMAL ENVIRONMENTAL SAMPL

End Depth 12'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw *Logged By / Dat* Chase Tim 7/6/12 *Reviewed By / Dat* _____

Sample Collection Log

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- Holloman AFB

Manager Christopher Long

* STATION 4

Location Code OTC544

RFA / COC Number 144106-HOL1

Sample Number OTC544-IS-0010-~~MMDDYY~~ 070612

Task

Sample Name OTC544-z-OTC544-IS-0010-MMDDYY-z

Collection Date 070612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1155

Sample Purpose ~~Unknown~~ Invest.

Start Depth 0'

QC Code NORMAL ENVIRONMENTAL SAMPL E

End Depth 2'

Sampling Equip Geoprobe

Sample Matrix SOIL

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

Shaw

Logged By / Dat Chas Hill 7/6/12

Reviewed By / Dat _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

* STATION 4

Location Code **OTC544**

RFA / COC Number 144106 - HOU

Sample Number **OTC544-IS-0011-~~MMDD~~YY** 070612

Task

Sample Name **OTC544-z-OTC544-IS-0011-MMDDYY-z**

Collection Date 070612

Sampling Method ~~Unknown~~ DPT

Sample Type ~~Unknown~~ Grab

Collection Time 1155

Sample Purpose ~~Unknown~~ invest.

Start Depth 14'

QC Code **NORMAL ENVIRONMENTAL SAMPL**

End Depth 16'

Sampling Equip Geoprobe

Sample Matrix **SOIL**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

SampleTeam CH/CL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	1	40	MG	40 mg Terracore	)(2) + MeOH
SW8015B : GRO	B	Unknown	1	40	ML	40 ml VOA Vials	Methanol
Metals by SW6010C	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Metals by SW6020A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
Mercury by SW7471A	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : DRO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SW8015B : ORO	C	Unknown	0	250	ML	250 ml Glass (8 oz)	Cool to 4°
SVOCs by SW8270D	C	Unknown	1	250	ML	250 ml Glass (8 oz)	Cool to 4°
Total CN soil by SW9012	D	Unknown	0	125	ML	125 ml Glass (4oz)	Cool to 4°
PCBs by SW8082A	D	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Explosives by SW8330A	E	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°
Tritium by 906.0 Mod	F	Unknown	1	125	ML	125 ml Glass (4oz)	Cool to 4°

Comments:

Sketch Location:

EMS Shaw

Logged By / Dat Chase Hill 7/6/12

Reviewed By / Dat _____

Sample Collection Log

MW01 Groundwater

Shaw Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code **OTC544**

RFA / COC Number 144106-H038

Sample Number **OTC544-GW-5441-~~MMDDYY~~** 090412

Task

Sample Name **OTC544-z-OTC544-GW-5441-~~MMDDYY~~-z** 090412

Collection Date 09/04/2012

Sampling Method ~~Unknown~~ Micropurge

Sample Type ~~Unknown~~ Grab

Collection Time 0840

Sample Purpose ~~Unknown~~ Investigation

Start Depth NA

End Depth NA

QC Code **NORMAL ENVIRONMENTAL SAMPL**

Sampling Equip Low flow Sampling Equipment QED Bladder pump

Sample Matrix **GROUND WATER**

QC Partners:

(TB) _____ *(EB)* _____ *(FB)* _____

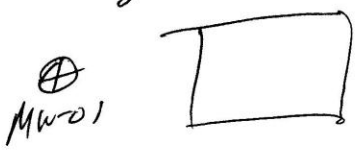
SampleTeam Harlan Hatton

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SW8015B : GRO	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	C	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
SW8015B : ORO	D	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015B : DRO	D	Unknown	2	1	L	1 Liter Amber Glass	H2SO4
PCBs by SW8082A	E	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Explosives by SW8330A	F	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Tritium by 906.0 Mod	G	Unknown	2	1	L	1 Liter Amber Glass	Cool to 4°
Mercury by SW7470A	H	Unknown	0	500	ML	500 ml Poly Container	HNO3
Metals by SW6020A	H	Unknown	0	500	ML	500 ml Poly Container	HNO3
Metals by SW6010C	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
Total CN water by 335.4	I	Unknown	1	500	ML	500 ml Poly Container	NaOH
TDS by 160.1	J	Unknown	1	500	ML	500 ml Poly Container	Cool to 4°

Comments:

Sketch Location: Bldg 1176



Shaw *Logged By / Dat* [signature] *Reviewed By / Dat* _____

Sample Collection Log

Page: ~~19 of 49~~ 1/1

IDW Soil

Shaw Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code ~~FIELDQC~~ IDW

RFA / COC Number HO 38

Sample Number ~~OTC644-GW-0111-MMDDYY-FD~~ LDY-IDWD1-090412

Sample Name ~~FIELDQC-1-OTC644-GW-0111-MMDDYY-FD-z~~

Task

Collection Date 09/04/2012

Sampling Method ~~Unknown~~ Composite

Sample Type ~~Unknown~~ Soil

Collection Time 1330

Sample Purpose ~~Unknown~~ IDW characterization

Start Depth NA

QC Code ~~FIELD DUPLICATE~~ NA

End Depth NA

Sampling Equip Stainless steel Trowel/Bowl/Aluminum

Sample Matrix ~~GROUND WATER~~ IDW Soil

QC Partners:

(TB) _____ (EB) _____ (FB) _____

SampleTeam LaThom, Hodu

Containers:

	Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
1)	VOCs by SW8260C TCLP VOCs	A	Unknown	~~3~~ 1	~~40~~ 8oz	~~ML~~	~~40 ml VOA Vials~~ Glass	~~HCL~~ Cool to 4°C
	~~SW8015B : GRO~~	B	Unknown	3	40	ML	40 ml VOA Vials	HCL
2)	SVOCs by SW8270D TCLP SVOCs / other organics	EB	Unknown	2 1	8	x oz	1 Liter Amber Glass Glass	Cool to 4°
	~~SW8015B : GRO~~	D	Unknown	0	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~SW8015B : DRO~~	D	Unknown	2	1	L	1 Liter Amber Glass	~~H2SO4~~
	~~PCBs by SW8082A~~ ~~TCLP~~	E	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
	~~Explosives by SW8330A~~	F	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~
3)	~~Tritium by 906.0 Mod~~ RCI	C	Unknown	2	1	L	1 Liter Amber Glass	~~Cool to 4°~~ Cool to 4°C
4)	Mercury by SW7470A TCLP Mercury	~~F~~ D	Unknown	0 1	~~500~~ 8oz	~~ML~~ oz	500 ml Poly Container Glass	~~HNO3~~ Cool to 4°C
5)	Metals by SW6020A TCLP Metals	~~H~~ E	Unknown	0 1	~~500~~ 8oz	~~ML~~	500 ml Poly Container Glass	~~HNO3~~ Cool to 4°C
	~~Metals by SW6010C~~	H	Unknown	1	500	ML	500 ml Poly Container	HNO3
	~~Total CN water by 335.4~~	I	Unknown	1	500	ML	~~500 ml Poly Container~~	NaOH
	~~TDS by 160.1~~	J	Unknown	1	500	ML	500 ml Poly Container	Cool to 4°

Comments: Composite Soil sample for TCLP analyses of IDW cuttings rolloff at Laydown Yard, 09/04/12

Sketch Location: Rolloff box Composite Sample @ Laydown Yard.

Analyses: TCLP VOCs, TCLP SVOCs, TCLP metals, TCLP Mercury, RCI

LDY = Laydown Yard

Shaw *Logged By / Dat* Mel Hall *Reviewed By / Dat* _____

Sample Collection Log

Shaw a world of Solutions

- Holloman AFB

Manager **Christopher Long**

Location Code BULK WATER TANK

RFA / COC Number 144106 H070

Sample Number HAFB-IDW-BULK WATER-0001-111612

Task 144106.JM20000

Sample Name HAFB-IDW-BULK WATER-0001-111612

Collection Date 11/16/12

Sampling Method BAILER

Sample Type GRAB

Collection Time 13:00

Sample Purpose CONFIRM IDW

Start Depth N/A

QC Code

End Depth N/A

Sampling Equip DISPOSABLE BAILER

Sample Matrix **WATER**

QC Partners:

(TB) (EB) (FB)

SampleTeam JH/TL

Containers:

Analytical Suite	Frtn	Flt	Qty	Size	Units	Container Type	Perservative
VOCs by SW8260C	A	Unknown	3	40	ML	40 ml VOA Vials	HCL
SVOCs by SW8270D	B	Unknown	4	8	8OZ	Amber Glass	Cool to 4°
SW8015 : ORO	C	Unknown	0	1	L	1 Liter Amber Glass	H2SO4
SW8015 : DRO	C	Unknown	1	1	L	1 Liter Amber Glass	H2SO4
Metals by SW6020A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
METALS by SW6020A	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Mercury by SW7470A	D	Unknown	0	500	ML	500 ml Poly Container	HNO3
	E		0	500	ML	500 ml Poly Cont	Cool to 4°
Metals by SW6010C	D	Unknown	1	500	ML	500 ml Poly Container	HNO3
	E		1	500	ML	500 ml Poly Cont	Cool to 4°
SW8015 : GRO	F	Unknown	3	40	ML	40 ml VOA Vials	HCL

Comments: SAMPLE COLLECTED FROM BULK WATER STORAGE TANK AFTER ALL WATER DRUMS WERE CONSOLIDATED. SENT BOTH A PRESERVED AND UNPRESERVED 500ML POLY FOR METALS. SPOKE WITH LAB AND THEY SAID TO SEND UNPRESERVED, BUT I THINK MAYBE THEY MADE A MISTAKE.

Sketch Location:

Shaw Logged By / Dat

Reviewed By / Dat

Appendix D
Boring Logs

Boring ID: OT-C544-Station 1

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1176

Date Completed: 7/6/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: C. LaChance

Ground Elevation AMSL (ft):4052.43
Y Coordinate: 685150.8683
X Coordinate: 1670599.6576

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); tan; dry; nonplastic; 85% silt; 15% very fine to fine sand.	ML	Hand auger from 0 - 5 ft. Began drilling on 7/6/12.
5		OTC544-IS-0001-070612	NR		Sandy SILT (ML); tan; dry; nonplastic; 70% silt; 30% very fine to fine sand.		
10		OTC544-IS-0002-070612	NR		Same as above (5 ft).		
15			NR		Same as above (5 ft); white; 55% silt; 45% very fine to find sand.		
20					Same as above (5 ft); tan to white; 60% silt; 40% very fine sand.		Total depth = 15 ft. Reached total depth on 7/6/12.
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:52 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C544-Station 2

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1176

Date Completed: 7/6/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: C. LaChance

Ground Elevation AMSL (ft):4051.55
Y Coordinate: 685143.8693
X Coordinate: 1670602.2819

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		SILT (ML); tan; dry; nonplastic; 80% silt; 20% very fine to fine sand.	ML	Hand auger from 0 - 5 ft. Began drilling on 7/6/12.
5			NR		Sandy SILT (ML); light brown; moist; 65% silt; 35% very fine to fine sand. Note: trace caliche.		
		OTC544-1S-0003-070612			Silty SAND (SM); white; dry; 80% very fine to fine sand; 20% silt.	SM	
10			NR		Same as above (8 ft); pale tan.		
15		OTC544-1S-0004-070612	NR		Poorly graded SAND with Silt (SP-SM); light tan; slightly moist; 90% very fine to fine sand; 10% silt.	SP-SM	
20			NR				Total depth = 20 ft. Reached total depth @ 1028 on 7/6/12.
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:52 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C544-Station 3

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1176

Date Completed: 7/6/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: C. LaChance

Ground Elevation AMSL (ft):4050.99
Y Coordinate: 685137.4282
X Coordinate: 1670600.6963

Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0			NR		Sandy SILT (ML); tan to light brown; dry; nonplastic; 60% silt; 40% very fine to fine sand.	ML	Hand auger from 0 - 5 ft. Began drilling on 7/6/12.
5		OTC544-1S-0005-070612	NR		Same as above (0 ft); 70% silt; 30% very fine to fine sand. Note: caliche present.		
					Same as above (0 ft); moist; low plasticity; 50% silt; 20% clay; 30% very fine sand.		
10					Silty SAND (SM); white; dry; loose; 85% very fine to fine sand; 15% silt.	SM	
		OTC544-1S-0006-070612	NR		Same as above (0 ft); 70% silt; 30% very fine to fine sand. Note: caliche present.	ML	
15			NR		Poorly graded SAND with Silt (SP-SM); white; slightly moist; loose; 90% very fine to fine sand; 10% silt.	SP-SM	
20			NR				Total depth = 20 ft. Reached total depth @ 1100 on 7/6/12.
25							
30							

FFOR_BOREHOLE_LOG - CLT CLAIRE TEMPLATE 21.GDT - 2/27/13 07:52 - N:\MIDWESTERN REGION PBR\MIDWEST GINT\HOLLOMAN AFB\MIDWEST_PBR_HOLLOMAN_GRP1.GPJ

Boring ID: OT-C544-Station 4 (OTC544-MW01)

Client: Holloman AFB
Project Location: Holloman AFB, NM
Project Name: Midwest PBR
Project Number: 144106.JR30000
Project Site: Building 1176

Date Completed: 7/6/2012
Drilling Contractor: Major Drilling
Drilling Method: DPT
Logged By: C. LaChance

Top of PVC Riser Pipe AMSL (ft): 4048.52
Y Coordinate: 685104.7396
X Coordinate: 1670587.9720

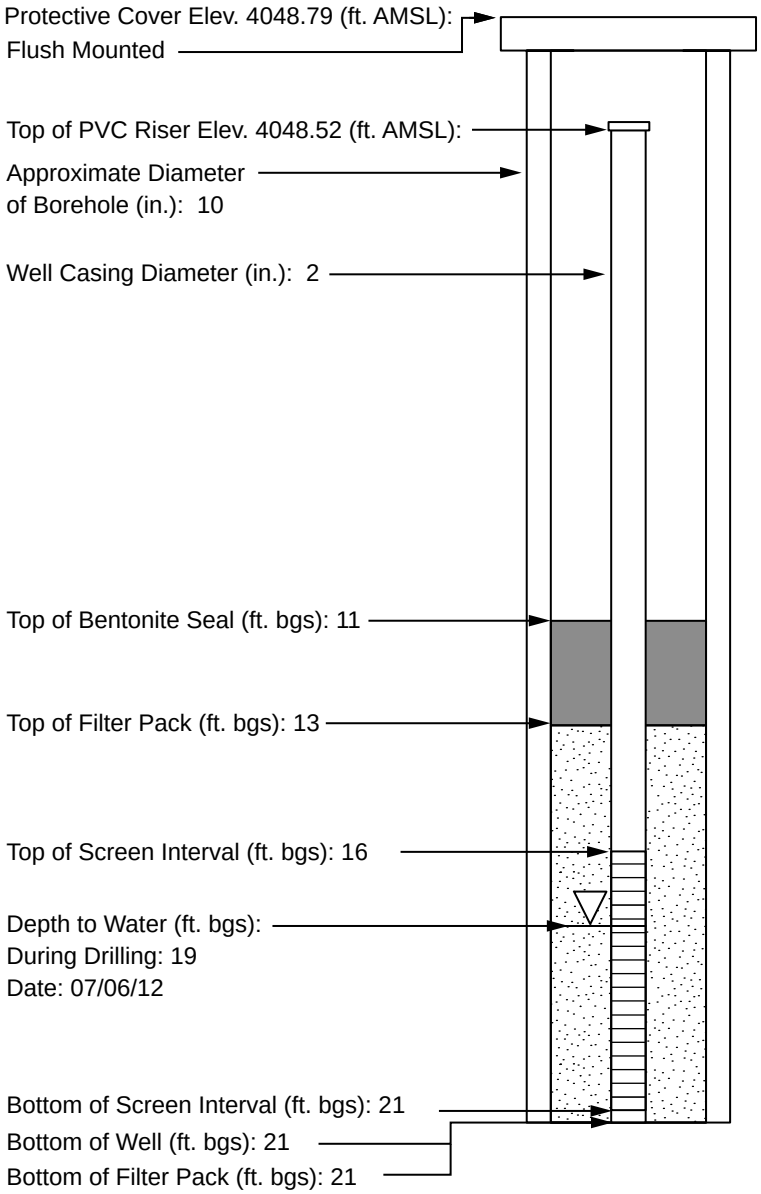
Depth (ft)	Sample Type	Sample Number	PID (ppm)	Lithologic Log	Material Description	U.S.C.S.	Remarks
0							
		OTC544-IS-0010-070612	NR		Sandy SILT (ML); tan to light brown; dry; soft; 70% silt; 30% very fine to fine sand.	ML	Hand auger from 0 - 5 ft. Began drilling on 7/6/12.
5		OTC544-IS-0007-070612 and OTC544-IS-0008-070612-FD	NR		Silty SAND (SM); tan; dry; loose; 80% very fine to fine sand; 20% silt. Note: caliche present.	SM	
10					SILT with Sand (ML); brown; moist; firm; medium plasticity; 55% silt; 25% clay; 20% very fine sand.	ML	
		OTC544-IS-0009-070612	NR		Same as above (8 ft); tan; 75% silt; 25% very fine to fine sand; soft.		
		OTC544-IS-0011-070612			Same as above (6 ft); white to tan; slightly moist.	SM	
15			NR		Poorly graded SAND with SILT (SP-SM); yellow brown; moist; loose; 90% very fine to fine sand; trace medium sand; 10% silt. ▽	SP-SM	Rust colored staining.
20			NR		Clayey SAND (SC); reddish brown; moist; dense; low plasticity; 70% very fine sand; 30% clay.	SC	Water @ 17 ft.
					Poorly graded SAND (SP); light brown; wet; loose; 100% medium to coarse sand.	SP	
					Same as above (18 ft).	SC	
					Same as above (14 ft); tan; wet.	SP-SM	
25			NR		Same as above (8 ft).	SC	Total depth = 25 ft. Reached total depth @ 1157 on 7/6/12.
30							

Appendix E
Well Construction Diagrams

Well Construction Diagram

Project: Holloman AFB
Location: OT-C544
Client: USAF
Subcontractor: Major Drilling
Driller: K. Burkhead
Drilling Method/Rig Type: DPT/Auger
Shaw Field Representative: C. LaChance

Well Number: OTC544-MW01
Site Location: Building 1176
Installation Date: 07/06/2012
Completion Date: 07/06/2012
Grid Northing: 685104.7396
Grid Easting: 1670587.9720
NAD 83 SPCS NM Central
NAVD 88



Not To Scale

Protective Casing: Circular
- Type: Flush Mount
- Dimensions (in.): 8
- Length (in.): 10
- Guard Post: NA

Ground Seal (Surface pad):
- Dimensions (ft.): 2 x 2
- Type: Concrete

Annular Space Seal:
- Type: QuickCrete & QuickGel Bentonite
- Installation: Gravity

Bentonite Seal:
- Manufacturer: Enviro Plug
- # of Bags: 2 (50 lbs each)
- Type: 3/8" Pellets
- Installation: Gravity
- Hydration time (hrs): 1

Filter Pack Material:
- Manufacturer: DSI
- Product Name: Well Gravel Pack
- Size: GP #3
- # of bags: 3 (50 lbs each)
- Installation: Gravity

Well Casing Used (ft.):
- Manufacturer: Silverline
- Type: PVC Schedule 40
- Diameter (in.): 2

Well Screen Casing:
- Manufacturer: DSI
- Type: 2" Pre-pack w/ vf SS Mesh w/ 1A Sand
- Slot Size (in.): 0.010
- Slot Type: Factory

Sump/End Cap (in.): 4 (PVC)
Backfill Material: NA

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-070

Appendix F
Well Purge Records

Shaw® Shaw E & I

EXAMPLE
WELL PURGE RECORD / Groundwater Sply

Project Name: Holloman AFB / Midwest

Location: Bldg 1176 Well/Piez. No.: OT-C544-MW-01

Personnel: Harlow, Latham Date Installed: _____

Date (Start/End): 09/04/2012 Csg. Diameter (I.D.): 2"

Method of Development: _____ Total Depth (ft. TOC): 21.10

☐ Surging ☐ Bailing ☐ Pumping ☐ Other (State Method) _____

☐ Original Development ☐ Redevelopment Development Date: _____

Depth to water before ~~developing~~ Sply well: 16.80

NA/GW Sply

NA/GW Sply

Volume (V) Purge Factor Volume To Purge

Height of Water Column: _____ feet _____ = _____ gal.* _____ = _____

$V = (B * r_c^2 * L_c * 7.48) + (B*(r_w-r_c)^2*L_s*ø_s*7.48) =$ _____ gallons (See Notes below)

Depth purging from: 19.0' feet Time purging begins: 0810

Weather: Sunny/cloudy, windy, breezy Screened Interval (ft. BGL): _____

NA/GW Sply

Equipment Nos.: pH Meter _____ EC Meter _____ Turbidity Meter _____

Equipment decontaminated prior to development Y ✓ N _____

Describe Distilled water rinse

Date 2012	Time	Water Level (ft. below TOC)	Volume Removed (gal.)	Temp (C or F) °C	pH Su	EC mS/cm	Turbidity NTU	D.O. mg/L	~~Comments~~ ORP mV	TDS g/L	water appearance
09/04	0810	*	NA*	20.76	7.43	6.125	43.6	5.89	29.7	3.978	clear
09/04	0815	*	NA*	20.60	7.41	6.101	1.5	5.75	34.3	3.840	clear
09/04	0820	*	NA*	20.62	7.40	6.053	1.6	5.71	37.6	3.921	clear
09/04	0825	*	NA*	20.88	7.39	6.011	2.0	5.85	40.5	3.902	clear
09/04	0830	*	NA*	20.96	7.39	6.001	2.5	5.89	42.3	3.898	clear
09/04	0835	*	NA*	21.00	7.39	5.994	2.3	5.89	42.7	3.892	clear
09/04	0840	Collect	Sample								

Sample Time 0840

Notes:

- Water levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to 0.1 pH units
- Electrical conductivity (EC) – Reported to the nearest 10% mhos/cm or
- µmho/cm @25 C or in mS/cm of instrument set range
- Water temperature – Reported to the nearest 0.1 C or F feet
- Dissolved oxygen (D.O.) report in 0.1 mg/L
- Turbidity report in NTV nearest whole #

Where:
B=3.14
$ø_s$=porosity of the sand pack
r_c =radius of the well casing and screen in feet
L_c=length of water column inside the casing and screen in feet
r_w =radius of the well bore in feet
L_s =length of saturated portion of the sand pack in feet
7.48 gallons/cubic foot=conversion from cubic feet to gallons

* WL below top of pump, pump set 2.5 above bottom
& Removed ~ 1.0 gal water

Appendix G
Site Survey Data

Revised Rpt
09/11/2013
(re: TU/US-C513)
p. 7 of 10

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	682987.8550	1687022.9920	4098.16	BASE	682789.9107	1686534.0572
2	678390.1010	1678735.5020	4064.77	CP-52-P-19	678193.4892	1678248.9690
3	683252.1480	1680789.5360	4078.80	CP-55-JACK	683054.1271	1680302.4077
4	681667.1260	1694574.3780	4140.57	CP-56-AIR	681469.5645	1694083.2546
5	669733.4460	1682234.2110	4048.59	HAFB-07-07	669539.3431	1681746.6640
6	669695.2030	1718768.4150	4157.95	ALAMOAIR	669501.1112	1718270.2797
7	674362.7100	1713591.4300	4160.17	F248	674167.2655	1713094.7951
8	676850.6600	1718114.2590	4193.99	E-248	676654.4944	1717616.3133
50	691964.7620	1687201.2770	4140.90	MALONE	691764.2160	1686712.2905
51	662077.1700	1670356.4250	4077.10	BATE	661885.2861	1669872.3205
52	678390.1080	1678735.5040	4066.10	P 19	678193.4962	1678248.9710
53	644127.0780	1700529.8000	4039.00	MONT	643940.3964	1700036.9506
54	676850.6920	1718114.2670	4193.99	E 248	676654.5264	1717616.3213
55	683252.1970	1680789.5390	4080.20	JACK	683054.1761	1680302.4107
56	681667.0380	1694574.3640	4141.20	AIR	681469.4765	1694083.2406
82	678193.4999	1678248.9801	4064.92	P	677996.9451	1677762.5882
84	676654.5300	1717616.3305	4192.77	E	676458.4212	1717118.5291
85	683054.1798	1680302.4198	4079.02	JACK	682856.2163	1679815.4327
86	681469.4802	1694083.2497	4140.00	AIR	681271.9760	1693592.2686
100	685975.0760	1686614.9100	4101.87	OT-C534-PVC	685776.2660	1686126.0934
101	685975.4260	1686614.8310	4102.28	OT-C534-CASING	685776.6159	1686126.0145
102	685952.4860	1686626.9650	4101.89	OT-C534-W2-PVC	685753.6825	1686138.1449
103	685952.6870	1686626.9300	4102.33	OT-C534-W2-CASING	685753.8834	1686138.1099
104	685939.9110	1686581.7340	4101.89	OT-C534-W1-CASING	685741.1111	1686092.9270
105	685939.6450	1686581.7790	4101.57	OT-C534-W1-PVC	685740.8452	1686092.9720
106	685924.3640	1686619.9800	4101.81	OT-C534-W4-PVC	685725.5687	1686131.1620
107	685924.6590	1686619.8790	4102.23	OT-C534-W4-CASING	685725.8636	1686131.0610
108	685934.1180	1686578.3320	4101.72	OT-C534-LEACH-NG	685735.3198	1686089.5260
109	685935.7830	1686600.7340	4101.88	OT-C534-LEACH-NG	685736.9843	1686111.9215
110	685938.2680	1686607.0980	4101.88	OT-C534-LEACH-NG	685739.4686	1686118.2837
111	685951.4240	1686604.4600	4101.90	OT-C534-LEACH-NG	685752.6208	1686115.6465
112	685953.8200	1686601.1380	4101.88	OT-C534-LEACH-NG	685755.0161	1686112.3254
113	685953.2500	1686596.8650	4101.88	OT-C534-LEACH-NG	685754.4463	1686108.0537
114	685946.2830	1686578.3790	4101.81	OT-C534-LEACH-NG	685747.4813	1686089.5730
115	685945.3070	1686576.3400	4101.88	OT-C534-LEACH-NG	685746.5056	1686087.5346
116	685940.6850	1686575.6580	4101.79	OT-C534-LEACH-NG	685741.8849	1686086.8528
117	685952.3510	1686614.8200	4102.03	OT-C534-LEACH-NG	685753.5475	1686126.0035
118	685953.0040	1686623.0300	4102.13	OT-C534-LEACH-NG	685754.2004	1686134.2111
119	685945.6920	1686623.1960	4102.03	OT-C534-LEACH-NG	685746.8905	1686134.3770
120	685944.8810	1686615.5440	4101.97	OT-C534-LEACH-NG	685746.0797	1686126.7272
121	685948.0570	1686615.1700	4101.97	OT-C534-FLINE-NG	685749.2548	1686126.3534
122	685947.7680	1686606.3420	4101.81	OT-C534-FLINE-NG	685748.9659	1686117.5279
123	685953.2050	1686618.0690	4102.08	OT-C534-ENFLU-NG	685754.4013	1686129.2515
124	685968.5800	1686611.5870	4102.06	OT-C534-ENFLU-NG	685769.7718	1686122.7714
125	686021.5760	1686604.3860	4102.49	OT-C534-ENFLU-NG	685822.7525	1686115.5725
126	686051.0660	1686600.5520	4102.82	OT-C534-ENFLU-NG	685852.2339	1686111.7396
127	682943.9250	1686529.5770	4094.74	OT-C536-STATION1-NG	682745.9934	1686040.7852
128	682925.1900	1686534.9010	4094.63	OT-C536-STATION2-NG	682727.2639	1686046.1076
129	682914.0740	1686530.8350	4094.17	OT-C536-STATION3-NG	682716.1511	1686042.0428
130	682900.2750	1686534.1950	4094.40	MW-OT-C5361-CASING	682702.3561	1686045.4018
131	682900.0410	1686534.2560	4094.03	MW-OT-C5361-PVC	682702.1222	1686045.4628
132	682892.0960	1686514.3610	4094.08	OT-C536-LEACH-NG	682694.1795	1686025.5736
133	682905.9860	1686504.4840	4093.98	OT-C536-LEACH-NG	682708.0654	1686015.6994
134	682914.9460	1686505.2970	4094.10	OT-C536-LEACH-NG	682717.0228	1686016.5122
135	682919.4610	1686521.1490	4094.40	OT-C536-LEACH-NG	682721.5365	1686032.3596
136	682921.1340	1686534.7310	4094.42	OT-C536-LEACH-NG	682723.2091	1686045.9377
137	682919.5910	1686545.0230	4094.72	OT-C536-LEACH-NG	682721.6665	1686056.2267
138	682912.1700	1686551.2270	4094.60	OT-C536-LEACH-NG	682714.2477	1686062.4289
139	682897.7180	1686551.9240	4094.16	OT-C536-LEACH-NG	682699.7998	1686063.1257
140	682892.5110	1686549.8820	4094.18	OT-C536-LEACH-NG	682694.5943	1686061.0843
141	682922.3680	1686533.4440	4094.42	OT-C536-TANKPIT-NG	682724.4427	1686044.6510
142	682920.9800	1686525.5880	4094.39	OT-C536-TANKPIT-NG	682723.0551	1686036.7973
143	682928.0220	1686524.4280	4094.63	OT-C536-TANKPIT-NG	682730.0951	1686035.6377
144	682929.2370	1686532.7090	4094.62	OT-C536-TANKPIT-NG	682731.3097	1686043.9163
145	682949.7020	1686528.9800	4094.75	OT-C536-ENFLU-NG	682751.7688	1686040.1883
146	682921.2900	1686528.9090	4094.41	OT-C536-ENFLU-NG	682723.3650	1686040.1174
147	682916.2970	1686530.1310	4094.27	OT-C536-ENFLU-NG	682718.3735	1686041.3390
148	682877.6850	1686739.3620	4095.03	OT-C533-MW-CASING	682679.7726	1686250.5094
149	682877.4490	1686739.4350	4094.68	OT-C533-MW-PVC	682679.5367	1686250.5823
150	682884.2550	1686735.8390	4094.76	OT-C533-LEACH-NG	682686.3407	1686246.9874
151	682877.4700	1686734.1690	4094.84	OT-C533-LEACH-NG	682679.5577	1686245.3179

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
152	682871.6400	1686736.6530	4094.83	OT-C533-LEACH-NG	682673.7294	1686247.8011
153	682869.4200	1686738.9370	4094.89	OT-C533-LEACH-NG	682671.5100	1686250.0845
154	682868.8760	1686741.4810	4094.99	OT-C533-LEACH-NG	682670.9662	1686252.6277
155	682867.8710	1686756.1100	4095.03	OT-C533-LEACH-NG	682669.9615	1686267.2525
156	682857.6950	1686766.0680	4095.35	OT-C533-LEACH-NG	682659.7884	1686277.2076
157	682855.8760	1686772.9280	4095.39	OT-C533-LEACH-NG	682657.9700	1686284.0656
158	682855.6590	1686783.4130	4095.46	OT-C533-LEACH-NG	682657.7530	1686294.5476
159	682855.5230	1686790.0690	4095.47	OT-C533-LEACH-NG	682657.6171	1686301.2017
160	682857.2270	1686794.8730	4095.42	OT-C533-LEACH-NG	682659.3206	1686306.0043
161	682858.6900	1686813.7880	4095.55	OT-C533-LEACH-NG	682660.7832	1686324.9138
162	682867.9360	1686816.7350	4095.32	OT-C533-LEACH-NG	682670.0265	1686327.8599
163	682880.0660	1686814.6740	4095.00	OT-C533-LEACH-NG	682682.1530	1686325.7995
164	682891.9700	1686818.7840	4094.82	OT-C533-LEACH-NG	682694.0535	1686329.9083
165	682901.1340	1686806.7570	4094.86	OT-C533-LEACH-NG	682703.2148	1686317.8848
166	682889.7110	1686785.0140	4094.98	OT-C533-LEACH-NG	682691.7952	1686296.1481
167	682889.3190	1686757.8750	4094.96	OT-C533-LEACH-NG	682691.4033	1686269.0170
168	682886.6550	1686745.7080	4094.83	OT-C533-LEACH-NG	682688.7400	1686256.8535
169	682895.8900	1686814.7130	4095.19	OT-C533-FFLUEN-NG	682697.9724	1686325.8385
170	682901.8890	1686814.2530	4095.86	OT-C533-FFLUEN-TPAD	682703.9696	1686325.3787
171	682901.5970	1686811.8220	4095.84	OT-C533-SEPTIC-TCONC	682703.6777	1686322.9484
172	682911.5820	1686810.3750	4095.77	OT-C533-SEPTIC-TCONC	682713.6598	1686321.5018
173	682912.4280	1686815.4170	4095.77	OT-C533-SEPTIC-TCONC	682714.5056	1686326.5423
174	682902.3730	1686816.8390	4095.84	OT-C533-SEPTIC-TCONC	682704.4535	1686327.9639
175	682912.0910	1686812.7560	4095.77	OT-C533-EFLUEN-TCONC	682714.1687	1686323.8821
176	682923.3600	1686810.9450	4095.29	OT-C533-EFLUEN-NG	682725.4344	1686322.0716
177	682942.2940	1686810.3140	4095.49	OT-C533-EFLUEN-NG	682744.3629	1686321.4408
178	682937.5080	1686805.9000	4095.30	OT-C533-STATION1-NG	682739.5783	1686318.0278
179	682906.2780	1686808.8380	4094.86	OT-C533-STATION2-NG	682708.3574	1686319.9652
180	682895.2770	1686813.2080	4094.98	OT-C533-STATION3-NG	682697.3595	1686324.3340
181	700191.9570	1695605.3730	4181.72	OT-C540-STATION1-ASP	699989.0266	1695113.9508
182	700173.9260	1695611.2520	4181.82	OT-C540-STATION2-NG	699971.0008	1695119.8281
183	700168.8930	1695604.5390	4181.39	OT-C540-STATION3-NG	699965.9693	1695113.1170
184	700151.2700	1695598.6630	4180.49	OT-C540-STATION4-NG	699948.3514	1695107.2427
185	700158.9630	1695593.9090	4180.86	OT-C540-LEACH-NG	699956.0422	1695102.4901
186	700150.2560	1695603.0840	4180.78	OT-C540-LEACH-NG	699947.3377	1695111.6625
187	700152.8330	1695609.6400	4180.81	OT-C540-LEACH-NG	699949.9139	1695118.2166
188	700155.1660	1695611.7200	4180.89	OT-C540-LEACH-NG	699952.2463	1695120.2960
189	700161.1020	1695611.3470	4181.11	OT-C540-LEACH-NG	699958.1805	1695119.9231
190	700163.7200	1695601.1600	4181.06	OT-C540-LEACH-NG	699960.7978	1695109.7390
191	700161.5790	1695596.1920	4181.05	OT-C540-LEACH-NG	699958.6574	1695104.7725
192	700165.7400	1695603.7570	4181.48	OT-C540-FFLUEN-NG	699962.8172	1695112.3353
193	700170.8520	1695608.8530	4181.93	OT-C540-FFLUEN-NG	699967.9277	1695117.4298
194	700170.7290	1695606.7600	4182.01	OT-C540-SEPTIC-NG	699967.8048	1695115.3374
195	700176.8760	1695605.4490	4181.91	OT-C540-SEPTIC-NG	699973.9500	1695114.0268
196	700177.5910	1695612.4300	4181.92	OT-C540-SEPTIC-NG	699974.6648	1695121.0058
197	700172.1930	1695613.9030	4182.05	OT-C540-SEPTIC-NG	699969.2683	1695122.4783
198	700177.7030	1695608.9790	4181.69	OT-C540-EFLUEN-NG	699974.7767	1695117.5558
199	700205.8220	1695608.1850	4181.85	OT-C540-EFLUEN-ASPH	700002.8876	1695116.7620
200	700246.4300	1695613.4690	4182.95	OT-C540-EFLUEN-ASPH	700043.4838	1695122.0445
201	700238.4930	1695614.0360	4182.51	OT-C540-BLDGCOR	700035.5491	1695122.6113
202	700228.4390	1695608.1640	4182.55	OT-C540-BLDGCOR	700025.4980	1695116.7410
203	700227.0510	1695568.0300	4182.87	OT-C540-BLDGCOR	700024.1104	1695076.6186
204	700236.9380	1695557.6950	4183.02	OT-C540-BLDGCOR	700033.9946	1695066.2866
205	688305.7410	1690609.5510	4126.46	TU\US-C507-STATION1-	688106.2555	1690119.5767
206	688309.7220	1690614.0760	4126.51	TU\US-C507-STATION2-	688110.2353	1690124.1004
207	688306.7130	1690619.4150	4126.45	TU\US-C507-STATION3-	688107.2272	1690129.4378
208	688313.7000	1690621.8280	4126.37	TU\US-C507-STATION4-	688114.2122	1690131.8501
209	688313.7950	1690607.6410	4126.36	TU\US-C507-STATION5-	688114.3071	1690117.6673
210	688304.0140	1690620.9730	4126.47	TU\US-C507-USTPIT-AS	688104.5290	1690130.9954
211	688304.3040	1690607.3010	4126.54	TU\US-C507-USTPIT-AS	688104.8189	1690117.3274
212	688317.4320	1690607.1780	4126.54	TU\US-C507-USTPIT-AS	688117.9431	1690117.2044
213	688317.6000	1690622.2860	4126.57	TU\US-C507-USTPIT-AS	688118.1110	1690132.3080
214	688320.7590	1690623.9670	4127.18	TU\US-C507-BLDGCOR	688121.2691	1690133.9885
215	688330.7630	1690627.7570	4125.65	TU\US-C507-BLDGCOR	688131.2702	1690137.7774
216	688318.5520	1690598.7120	4126.71	TU\US-C507-BLDGCOR	688119.0628	1690108.7408
217	688306.5580	1690598.9520	4126.69	TU\US-C507-BLDGCOR	688107.0722	1690108.9808
218	688287.5740	1690592.3200	4126.83	TU\US-C507-EXMW1	688088.0937	1690102.3507
219	688287.4600	1690625.9270	4126.36	TU\US-C507-EXMW2	688087.9798	1690135.9480
220	689216.8690	1680453.8850	4087.76	TU\US-C501-STATION4-	689017.1194	1679966.8540
221	689203.4000	1680450.4300	4087.80	TU\US-C501-STATION1-	689003.6543	1679963.4000
222	689227.9170	1680449.2880	4087.78	TU\US-C501-STATION2-	689028.1642	1679962.2584

RAW DATA

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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
223	689201.2820	1680437.6020	4087.96	TU\US-C501-STATION3-	689001.5369	1679950.5757
224	689204.0090	1680426.7550	4087.80	TU\US-C501-STATION5-	689004.2631	1679939.7319
225	689200.5240	1680440.6650	4087.95	TU\US-C501-BLDGCOR-N	689000.7792	1679953.6379
226	689191.1430	1680432.8740	4088.07	TU\US-C501-BLDGCOR-N	688991.4009	1679945.8491
227	689202.0960	1680449.8730	4087.79	TU\US-C501-TANKPIT-N	689002.3507	1679962.8432
228	689201.5860	1680440.8210	4087.99	TU\US-C501-TANKPIT-N	689001.8408	1679953.7938
229	689191.7450	1680432.9310	4088.07	TU\US-C501-TANKPIT-N	688992.0027	1679945.9061
230	689195.4710	1680423.1750	4087.88	TU\US-C501-TANKPIT-N	688995.7276	1679936.1529
231	689207.1960	1680422.4490	4087.92	TU\US-C501-TANKPIT-N	689007.4492	1679935.4271
232	689229.2900	1680431.3210	4087.77	TU\US-C501-TANKPIT-N	689029.5368	1679944.2966
233	689231.6150	1680444.1310	4087.67	TU\US-C501-TANKPIT-N	689031.8611	1679957.1029
234	689227.5450	1680454.7320	4087.83	TU\US-C501-TANKPIT-N	689027.7923	1679967.7008
235	689218.0540	1680463.3780	4088.03	TU\US-C501-TANKPIT-N	689018.3041	1679976.3443
236	689209.0460	1680458.6260	4087.92	TU\US-C501-TANKPIT-N	689009.2987	1679971.5937
237	689237.1630	1680445.1670	4087.64	TU\US-C501-COMMLINE-	689037.4075	1679958.1386
238	689219.6050	1680436.9770	4088.00	TU\US-C501-COMMLINE-	689019.8546	1679949.9509
239	689199.7540	1680431.6770	4088.06	TU\US-C501-COMMLINE-	689000.0094	1679944.6525
240	689181.3550	1680425.0490	4088.20	TU\US-C501-COMMLINE-	688981.6157	1679938.0264
241	689162.6180	1680417.3900	4088.35	TU\US-C501-COMMLINE-	688962.8841	1679930.3696
242	689161.5970	1680417.5650	4088.56	TU\US-C501-COMMVAULT	688961.8634	1679930.5446
243	689157.8580	1680421.3400	4088.11	TU\US-C501-COMMVAULT	688958.1255	1679934.3185
244	689150.8680	1680414.5760	4088.10	TU\US-C501-COMMVAULT	688951.1375	1679927.5564
245	689154.6050	1680410.8830	4088.46	TU\US-C501-COMMVAULT	688954.8735	1679923.8645
246	687246.6430	1686873.0010	4105.82	OT-C535-STATION1-NG	687047.4644	1686384.1096
247	687270.5400	1686861.6690	4105.63	OT-C535-STATION2-NG	687071.3545	1686372.7809
248	687282.8340	1686866.7860	4105.85	OT-C535-STATION3-NG	687083.6449	1686377.8964
249	687303.5940	1686788.5490	4105.12	OT-C535-STATION4-NG	687104.3989	1686299.6821
250	687291.9640	1686793.7970	4105.27	OT-C535-LEACH-NG	687092.7723	1686304.9286
251	687304.7930	1686782.8770	4105.17	OT-C535-LEACH-NG	687105.5976	1686294.0117
252	687323.6740	1686798.1880	4105.34	OT-C535-LEACH-NG	687124.4731	1686309.3183
253	687319.7080	1686817.5380	4105.82	OT-C535-LEACH-NG	687120.5083	1686328.6627
254	687307.4400	1686838.9610	4105.76	OT-C535-LEACH-NG	687108.2438	1686350.0795
255	687297.0830	1686856.5380	4106.04	OT-C535-LEACH-NG	687097.8898	1686367.6514
256	687290.0540	1686837.9200	4105.59	OT-C535-LEACH-NG	687090.8628	1686349.0388
257	687291.3760	1686806.0200	4105.33	OT-C535-LEACH-NG	687092.1845	1686317.1480
258	687284.5890	1686864.5150	4106.11	OT-C535-FFLUEN-NG	687085.3994	1686375.6261
259	687276.8290	1686868.4490	4106.19	OT-C535-FFLUEN-NG	687077.6417	1686379.5589
260	687276.0820	1686870.8490	4106.28	OT-C535-SEPTIC-NG	687076.8949	1686381.9583
261	687263.3720	1686869.7190	4105.87	OT-C535-SEPTIC-NG	687064.1886	1686380.8286
262	687263.7200	1686863.5770	4105.95	OT-C535-SEPTIC-NG	687064.5365	1686374.6884
263	687276.4840	1686862.8870	4106.07	OT-C535-SEPTIC-NG	687077.2968	1686373.9986
264	687263.5270	1686868.1150	4105.92	OT-C535-EFLUEN-NG	687064.3435	1686379.2250
265	687228.9570	1686874.1570	4105.71	OT-C535-EFLUEN-NG	687029.7836	1686385.2653
266	687235.2230	1686881.4610	4106.05	OT-C535-BLDGCOR-NG	687036.0477	1686392.5672
267	687225.9150	1686892.3360	4105.90	OT-C535-BLDGCOR-NG	687026.7424	1686403.4390
268	687232.0250	1686844.5370	4105.92	OT-C535-BLDGCOR-NG	687032.8507	1686355.6539
269	687221.4890	1686835.3400	4105.63	OT-C535-BLDGCOR-NG	687022.3177	1686346.4595
270	677637.2460	1692755.6660	4110.24	TU/US-C505-MW1-CASIN	677440.8524	1692265.0697
271	677636.9990	1692755.6590	4109.84	TU/US-C505-MW1-PVC	677440.6055	1692265.0627
272	677634.4160	1692722.3930	4110.42	TU/US-C505-WELLATEMP	677438.0233	1692231.8064
273	677659.4620	1692742.2400	4110.34	TU/US-C505-WELLATEMP	677463.0620	1692251.6476
274	677701.9500	1692799.3200	4110.17	TU/US-C505-USTPIT-NG	677505.5377	1692308.7111
275	677701.3830	1692789.3010	4110.35	TU/US-C505-USTPIT-NG	677504.9708	1692298.6950
276	677711.5570	1692789.5280	4110.64	TU/US-C505-USTPIT-NG	677515.1419	1692298.9219
277	677710.8940	1692799.1130	4110.24	TU/US-C505-USTPIT-NG	677514.4791	1692308.5041
278	677707.4060	1692790.0820	4110.35	TU/US-C505-STATION1-	677510.9921	1692299.4757
279	677702.3100	1692795.0710	4110.20	TU/US-C505-STATION2-	677505.8976	1692304.4633
280	677705.6610	1692797.9500	4110.13	TU/US-C505-STATION3-	677509.2476	1692307.3415
281	677710.4770	1692793.8740	4110.09	TU/US-C505-STATION4-	677514.0622	1692303.2666
282	677706.4200	1692793.8350	4110.12	TU/US-C505-STATION5-	677510.0064	1692303.2276
283	677694.5060	1692779.7220	4110.88	TU/US-C505-BLDGCOR-N	677498.0958	1692289.1187
284	677704.1940	1692790.4680	4110.28	TU/US-C505-BLDGCOR-N	677507.7810	1692299.8616
285	677754.5670	1692783.0890	4110.79	TU/US-C505-BLDGCOR-N	677558.1394	1692292.4848
286	677743.8570	1692795.1680	4110.70	TU/US-C505-BLDGCOR-N	677547.4325	1692304.5603
287	686300.2320	1672933.0350	4060.98	OT-C542-MW-CASING-	686101.3277	1672448.1837
288	686300.2350	1672933.0550	4060.98	OT-C542-MW-PVC	686101.3307	1672448.2037
289	686274.4020	1672914.6520	4061.01	OT-C542-LEACH-NG	686075.5052	1672429.8061
290	686289.6710	1672938.5250	4060.76	OT-C542-LEACH-NG	686090.7698	1672453.6721
291	686294.6900	1672941.1720	4060.83	OT-C542-LEACH-NG	686095.7873	1672456.3184
292	686301.6970	1672938.9490	4060.85	OT-C542-LEACH-NG	686102.7923	1672454.0960
293	686305.7170	1672936.2850	4060.87	OT-C542-LEACH-NG	686106.8111	1672451.4328

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
294	686308.0670	1672931.0550	4060.89	OT-C542-LEACH-NG	686109.1604	1672446.2043
295	686304.8000	1672917.9090	4060.82	OT-C542-LEACH-NG	686105.8944	1672433.0621
296	686292.3740	1672901.2590	4060.90	OT-C542-LEACH-NG	686093.4720	1672416.4169
297	686283.4190	1672906.7050	4060.97	OT-C542-FFLUEN-NG	686084.5196	1672421.8614
298	686280.3770	1672902.6520	4060.94	OT-C542-FFLUEN-NG	686081.4785	1672417.8095
299	686276.9070	1672904.6420	4060.95	OT-C542-SEPTIC-NG	686078.0095	1672419.7990
300	686271.2980	1672896.9550	4060.80	OT-C542-SEPTIC-NG	686072.4021	1672412.1142
301	686281.9530	1672889.9350	4060.83	OT-C542-SEPTIC-NG	686083.0540	1672405.0962
302	686287.0950	1672896.6800	4060.88	OT-C542-SEPTIC-NG	686088.1945	1672411.8393
303	686285.7900	1672894.7150	4060.83	OT-C542-EFLUEN-NG	686086.8899	1672409.8748
304	686299.2270	1672887.1560	4060.87	OT-C542-EFLUEN-NG	686100.3230	1672402.3180
305	686310.9860	1672881.5880	4061.18	OT-C542-EFLUEN-NG	686112.0786	1672396.7516
306	686294.2970	1672858.0380	4060.90	OT-C542-BLDGCOR-NG	686095.3944	1672373.2085
307	686295.8820	1672844.1310	4061.28	OT-C542-BLDGCOR-NG	686096.9790	1672359.3055
308	686345.1390	1672922.4560	4060.89	OT-C542-BLDGCOR-NG	686146.2217	1672437.6078
309	686358.9780	1672924.0940	4061.42	OT-C542-BLDGCOR-NG	686160.0567	1672439.2453
310	686291.8860	1672885.1500	4060.65	OT-C542-STATION1-NG	686092.9841	1672400.3126
311	686275.2730	1672891.5340	4060.63	OT-C542-STATION2-NG	686076.3760	1672406.6948
312	686281.5390	1672904.6340	4060.73	OT-C542-STATION2-NG	686082.6401	1672419.7910
313	685750.1690	1671530.2910	4055.60	OT-C543-STATION2-NG	685551.4241	1671045.8463
314	685734.0730	1671548.8090	4055.84	OT-C543-STATION2	685535.3328	1671064.3589
315	685727.7350	1671514.3350	4055.33	OT-C543-STATION3	685528.9966	1671029.8949
316	685749.4390	1671546.6740	4055.91	OT-C543-EXSEPTIC	685550.6944	1671062.2245
317	685732.6430	1671545.5190	4055.74	OT-C543-EXSEPTIC	685533.9032	1671061.0699
318	685741.2600	1671557.0720	4056.32	OT-C543-EXSEPTIC	685542.5177	1671072.6195
319	685738.1510	1671537.7290	4055.62	OT-C543-EXSEPTIC	685539.4096	1671053.2821
320	685734.3520	1671541.2760	4055.65	OT-C543-FFLUEN	685535.6117	1671056.8281
321	685716.0920	1671515.5090	4055.04	OT-C543-FFLUEN	685517.3570	1671031.0686
322	685708.2650	1671520.5800	4055.23	OT-C543-LEACH	685509.5323	1671036.1381
323	685688.3040	1671512.0560	4055.52	OT-C543-LEACH	685489.5771	1671027.6166
324	685669.5610	1671502.3840	4055.36	OT-C543-LEACH	685470.8395	1671017.9474
325	685659.9210	1671495.2130	4055.04	OT-C543-LEACH	685461.2023	1671010.7784
326	685670.4020	1671495.5660	4055.43	OT-C543-MW-CASING	685471.6803	1671011.1313
327	685670.1370	1671495.6580	4055.13	OT-C543-MW-PVC	685471.4153	1671011.2233
328	685682.2550	1671485.7460	4055.16	OT-C543-LEACH	685483.5298	1671001.3142
329	685699.8070	1671491.2750	4054.76	OT-C543-LEACH	685501.0767	1671006.8416
330	685710.4840	1671499.0550	4055.06	OT-C543-LEACH	685511.7506	1671014.6193
331	685721.5030	1671508.4730	4055.40	OT-C543-LEACH	685522.7664	1671024.0346
332	685794.8190	1671498.3320	4056.84	OT-C543-EFLUEN	685596.0612	1671013.8965
333	685809.3600	1671495.0820	4059.27	OT-C543-BLDGCOR	685610.5980	1671010.6475
334	685776.9050	1671465.9090	4060.02	OT-C543-BLDGCOR	685578.1524	1670981.4829
335	685785.4230	1671455.8900	4060.26	OT-C543-BLDGCOR	685586.6679	1670971.4668
336	685744.8400	1671542.1950	4055.76	OT-C543-EFLUEN	685546.0967	1671057.7468
337	685303.6520	1671072.3550	4048.79	OT-C544-MW-CASING	685105.0365	1670588.0430
338	685303.3550	1671072.2840	4048.52	OT-C544-MW-PVC	685104.7396	1670587.9720
339	685349.4970	1671083.9730	4052.43	OT-C544-STATION1	685150.8683	1670599.6576
340	685342.4960	1671086.5980	4051.55	OT-C544-STATION1	685143.8693	1670602.2819
341	685336.0530	1671085.0120	4050.99	OT-C544-STATION1	685137.4282	1670600.6963
342	685336.7000	1671089.5480	4051.15	OT-C544-SEPTIC	685138.0750	1670605.2310
343	685338.4520	1671075.7050	4051.30	OT-C544-SEPTIC	685139.8265	1670591.3920
344	685347.8050	1671077.3720	4052.23	OT-C544-SEPTIC	685149.1768	1670593.0585
345	685345.6600	1671089.9410	4052.38	OT-C544-SEPTIC	685147.0324	1670605.6239
346	685356.1020	1671079.9660	4041.22	OT-C544-EFLUEN	685157.4713	1670595.6518
347	685347.2700	1671081.8770	4052.36	OT-C544-EFLUEN	685148.6419	1670597.5622
348	685337.4940	1671082.4320	4051.31	OT-C544-FFLUEN	685138.8687	1670598.1171
349	685335.1290	1671082.2690	4051.14	OT-C544-FFLUEN	685136.5044	1670597.9541
350	685336.2280	1671075.8560	4050.85	OT-C544-LEACH	685137.6031	1670591.5430
351	685323.3310	1671071.0830	4049.91	OT-C544-LEACH	685124.7098	1670586.7714
352	685297.8990	1671068.1360	4048.16	OT-C544-LEACH	685099.2852	1670583.8252
353	685296.9990	1671078.2660	4047.94	OT-C544-LEACH	685098.3855	1670593.9523
354	685317.0900	1671090.9580	4049.62	OT-C544-LEACH	685118.4707	1670606.6406
355	685334.6940	1671090.0750	4050.81	OT-C544-LEACH	685136.0696	1670605.7579
356	685360.4020	1671127.4140	4053.89	OT-C544-BLDGCOR	685161.7701	1670643.0860
357	685349.8450	1671114.5020	4052.32	OT-C544-BLDGCOR	685151.2162	1670630.1778
358	685360.3480	1671033.1240	4052.96	OT-C544-BLDGCOR	685161.7161	1670548.8234
359	685371.1230	1671022.2010	4053.70	OT-C544-BLDGCOR	685172.4880	1670537.9035
360	669828.5970	1693339.1960	4077.44	TU/US-C503-STATION1	669634.4665	1692848.4306
361	669823.8520	1693340.4930	4077.30	TU/US-C503-STATION2	669629.7229	1692849.7272
362	669816.1660	1693331.0930	4077.32	TU/US-C503-STATION3	669622.0391	1692840.3299
363	669804.9830	1693324.1990	4077.14	TU/US-C503-STATION5	669610.8594	1692833.4379
364	669830.2120	1693344.6950	4077.63	TU/US-C503-STATION4	669636.0811	1692853.9280

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
365	669820.3680	1693343.5050	4078.10	TU/US-C503-USTTANK	669626.2399	1692852.7383
366	669826.9160	1693337.2450	4077.78	TU/US-C503-USTTANK	669632.7860	1692846.4802
367	669831.7020	1693342.9300	4077.73	TU/US-C503-USTTANK	669637.5706	1692852.1635
368	669817.5060	1693300.2710	4077.28	TU/US-C503-BLDGCOR	669623.3788	1692809.5169
369	669817.0280	1693314.4610	4077.69	TU/US-C503-BLDGCOR	669622.9009	1692823.7028
370	669870.4630	1693326.6030	4077.24	TU/US-C503-BLDGCOR	669676.3204	1692835.8412
371	669857.6770	1693326.9550	4077.12	TU/US-C503-BLDGCOR	669663.5381	1692836.1931
372	669799.9830	1693280.8270	4076.53	TU/US-C503-BLDGCOR	669605.8608	1692790.0785
373	669786.0040	1693280.0690	4077.00	TU/US-C503-BLDGCOR	669591.8859	1692789.3207
374	669753.1970	1693299.5360	4076.55	TU/US-C503-MW1-CASIN	669559.0884	1692808.7821
375	669753.0160	1693299.6510	4076.22	TU/US-C503-MW1-PVC	669558.9075	1692808.8971
376	669717.9520	1693348.6000	4074.92	TU/US-C503-MW3-PVC	669523.8536	1692857.8319
377	669718.0930	1693348.2730	4075.65	TU/US-C503-MW3-CASIN	669523.9946	1692857.5050
378	669746.8950	1693329.2100	4076.92	TU/US-C503-BLDGCOR	669552.7882	1692838.4475
379	669747.5820	1693308.1150	4076.21	TU/US-C503-BLDGCOR	669553.4750	1692817.3586
380	669906.5180	1693361.1640	4077.43	TU/US-C503-MW2-CASIN	669712.3650	1692870.3922
381	669906.2520	1693361.2650	4077.07	TU/US-C503-MW2-PVC	669712.0990	1692870.4932
382	669887.0390	1693344.8910	4077.53	TU/US-C503-BLDGCOR	669692.8916	1692854.1239
383	669886.0230	1693359.0930	4077.99	TU/US-C503-BLDGCOR	669691.8759	1692868.3218
384	670862.3470	1691695.2520	4072.78	TU/US-C500-MW1-CASIN	670667.9169	1691204.9630
385	670862.1340	1691695.4850	4072.39	TU/US-C500-MW1-PVC	670667.7040	1691205.1960
386	670897.1420	1691671.0590	4072.25	TU/US-C500-MW2-PVC	670702.7019	1691180.7771
387	670897.3420	1691670.8340	4072.66	TU/US-C500-MW2-CASIN	670702.9018	1691180.5521
388	670997.2710	1691721.0890	4072.90	TU/US-C500-MW3-CASIN	670802.8018	1691230.7926
389	670996.9840	1691721.2540	4072.41	TU/US-C500-MW3-PVC	670802.5149	1691230.9575
390	670952.1640	1691699.4910	4072.04	TU/US-C500-STATION1	670757.7079	1691209.2008
391	670948.0960	1691682.1740	4072.36	TU/US-C500-STATION4	670753.6411	1691191.8888
392	670936.4590	1691683.8290	4072.05	TU/US-C500-STATION5	670742.0075	1691193.5434
393	670929.6330	1691690.0950	4072.11	TU/US-C500-STATION2	670735.1834	1691199.8075
394	670923.0530	1691673.0510	4072.18	TU/US-C500-STATION3	670728.6054	1691182.7685
395	670946.5050	1691708.7370	4072.40	TU/US-C500-USTPIT	670752.0506	1691218.4441
396	670961.7540	1691693.8260	4072.62	TU/US-C500-USTPIT	670767.2951	1691203.5375
397	670931.1680	1691662.3970	4072.93	TU/US-C500-USTPIT	670736.7180	1691172.1176
398	670915.4940	1691676.4560	4072.43	TU/US-C500-USTPIT	670721.0485	1691186.1725
399	670921.7940	1691667.6910	4072.61	TU/US-C500-BLDGCOR	670727.3467	1691177.4100
400	670938.3020	1691685.3670	4072.19	TU/US-C500-BLDGCOR	670743.8499	1691195.0809
401	670954.8550	1691686.5260	4072.52	TU/US-C500-BLDGCOR	670760.3981	1691196.2396
402	670964.2580	1691691.8600	4072.50	TU/US-C500-BLDGCOR	670769.7984	1691201.5720
403	670981.1410	1691692.8760	4072.84	TU/US-C500-BLDGCOR	670786.6765	1691202.5877
404	681138.2190	1690535.4430	4109.80	OT-C538-MW1-CASING	680940.8108	1690045.4902
405	681137.9660	1690535.5040	4109.43	OT-C538-MW1-PVC	680940.5579	1690045.5512
406	681154.3000	1690506.8540	4109.64	OT-C538-STATION3	680956.8871	1690016.9095
407	681170.7650	1690504.3700	4110.30	OT-C538-STATION2	680973.3473	1690014.4262
408	681207.7160	1690542.9160	4110.07	OT-C538-STATION1	681010.2876	1690052.9610
409	681171.2020	1690513.1430	4110.35	OT-C538-SEPTIC	680973.7842	1690023.1966
410	681160.8350	1690514.8700	4110.22	OT-C538-SEPTIC	680963.4202	1690024.9231
411	681157.5830	1690502.2430	4109.87	OT-C538-SEPTIC	680960.1692	1690012.2998
412	681168.6240	1690500.8410	4110.30	OT-C538-SEPTIC	680971.2070	1690010.8982
413	681157.7430	1690507.8780	4109.92	OT-C538-FFLUEN	680960.3291	1690017.9332
414	681149.7900	1690513.8560	4109.82	OT-C538-FFLUEN	680952.3784	1690023.9094
415	681146.2870	1690511.1610	4109.76	OT-C538-LEACH	680948.8764	1690021.2152
416	681140.0690	1690516.2140	4109.76	OT-C538-LEACH	680942.6602	1690026.2667
417	681131.8360	1690535.6580	4109.59	OT-C538-LEACH	680934.4296	1690045.7051
418	681142.3480	1690541.6090	4109.45	OT-C538-LEACH	680944.9386	1690051.6544
419	681148.4850	1690524.6340	4109.80	OT-C538-LEACH	680951.0738	1690034.6843
420	681152.9240	1690518.6140	4110.01	OT-C538-LEACH	680955.5115	1690028.6661
421	681171.0630	1690513.0040	4110.32	OT-C538-EFLUEN	680973.6453	1690023.0577
422	681199.3120	1690534.6340	4109.92	OT-C538-EFLUEN	681001.8861	1690044.6814
423	681311.9210	1690619.8910	4111.94	OT-C538-EFLUEN	681114.4624	1690129.9137
424	681378.0600	1690614.8720	4112.52	OT-C538-EFLUEN	681180.5823	1690124.8962
425	681511.9950	1690621.0250	4112.35	OT-C538-EFLUEN-C/O	681314.4785	1690131.0474
426	681543.8210	1690614.3290	4112.13	OT-C538-EFLUEN-C/O	681346.2952	1690124.3533
427	681545.1500	1690624.0320	4110.59	OT-C538-EFLUEN	681347.6238	1690134.0535
428	681526.9290	1690617.7410	4112.19	OT-C538-BLDGCOR	681329.4081	1690127.7643
429	681516.5600	1690627.6780	4112.22	OT-C538-BLDGCOR	681319.0421	1690137.6984
430	681517.0030	1690674.6590	4112.55	OT-C538-BLDGCOR	681319.4850	1690184.6658
431	681526.9640	1690685.0850	4112.68	OT-C538-BLDGCOR	681329.4431	1690195.0888
432	681610.3380	1690617.1910	4112.15	OT-C538-BLDGCOR	681412.7929	1690127.2145
433	681620.0290	1690626.9090	4112.29	OT-C538-BLDGCOR	681422.4811	1690136.9297
434	681248.7970	1690511.7190	4110.11	OT-C537-STATION1	681051.3567	1690021.7731
435	681230.2540	1690505.9940	4109.96	OT-C537-STATION2	681032.8191	1690016.0497

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
436	681220.0430	1690509.7920	4110.12	OT-C537-STATION3	681022.6111	1690019.8466
437	681224.9030	1690501.6020	4109.95	OT-C537-SEPTICDRY	681027.4697	1690011.6590
438	681224.2220	1690518.0560	4110.28	OT-C537-SEPTICDRY	681026.7889	1690028.1082
439	681236.7540	1690518.9910	4110.31	OT-C537-SEPTICDRY	681039.3172	1690029.0429
440	681236.4080	1690501.8520	4110.13	OT-C537-SEPTICDRY	681038.9713	1690011.9089
441	681237.2180	1690508.8330	4110.12	OT-C537-INLINE	681039.7811	1690018.8879
442	681311.7430	1690515.4440	4111.03	OT-C537-INLINE	681114.2845	1690025.4970
443	670561.7210	1680587.5740	4050.10	TU/US-C506-MW2-CASIN	670367.3781	1680100.5043
444	670561.4170	1680587.6760	4049.68	TU/US-C506-MW2-PVC	670367.0742	1680100.6062
445	670504.3430	1680580.0920	4050.14	TU/US-C506-MW1-PVC	670310.0167	1680093.0244
446	670504.5340	1680580.0020	4050.56	TU/US-C506-MW1-CASIN	670310.2076	1680092.9345
447	670508.2600	1680580.6030	4050.26	TU/US-C506-USTTANK	670313.9326	1680093.5353
448	670507.1490	1680575.9500	4050.27	TU/US-C506-USTTANK	670312.8219	1680088.8836
449	670517.9280	1680578.9030	4050.27	TU/US-C506-USTTANK	670323.5978	1680091.8358
450	670517.4300	1680574.2280	4050.28	TU/US-C506-USTTANK	670323.0999	1680087.1621
451	670507.9350	1680578.1630	4050.18	TU/US-C506-STATION1	670313.6077	1680091.0960
452	670513.3690	1680579.8330	4050.20	TU/US-C506-STATION2	670319.0401	1680092.7655
453	670517.9640	1680576.4150	4050.25	TU/US-C506-STATION3	670323.6338	1680089.3485
454	670511.2330	1680575.3810	4050.12	TU/US-C506-STATION4	670316.9047	1680088.3148
455	670512.5770	1680577.6370	4050.16	TU/US-C506-STATION5	670318.2483	1680090.5702
456	670485.1820	1680557.6150	4050.53	TU/US-C506-EXMW1-CAS	670290.8613	1680070.5540
457	670484.8980	1680557.6790	4050.38	TU/US-C506-EXMW1-PVC	670290.5773	1680070.6179
458	670494.8180	1680553.5430	4050.36	TU/US-C506-BLDGCOR	670300.4945	1680066.4831
459	670506.7310	1680561.7710	4050.38	TU/US-C506-BLDGCOR	670312.4040	1680074.7088
460	670510.1770	1680607.5970	4050.36	TU/US-C506-BLDGCOR	670315.8490	1680120.5215
461	670507.2460	1680618.1900	4050.39	TU/US-C506-BLDGCOR	670312.9189	1680131.1114
462	672564.5350	1692766.5990	4084.67	OT-C530-STATION1	672369.6116	1692275.9995
463	672567.1650	1692774.7240	4084.79	OT-C530-STATION2	672372.2409	1692284.1222
464	672567.5210	1692771.2850	4084.93	OT-C530-ACTSEPTIC	672372.5967	1692280.6842
465	672572.0780	1692767.3740	4084.89	OT-C530-ACTSEPTIC	672377.1524	1692276.7743
466	672575.8660	1692771.9070	4084.91	OT-C530-ACTSEPTIC	672380.9393	1692281.3060
467	672571.4280	1692775.8290	4084.95	OT-C530-ACTSEPTIC	672376.5026	1692285.2269
468	672569.6900	1692769.3550	4084.91	OT-C530-INLINE	672374.7651	1692278.7547
469	672563.6000	1692772.1360	4084.83	OT-C530-MW-CASING	672368.6769	1692281.5349
470	672563.2920	1692772.2960	4084.49	OT-C530-MW-PVC	672368.3690	1692281.6949
471	672509.9810	1692700.4750	4085.41	OT-C530-INLINE	672315.0734	1692209.8947
472	672538.3940	1692677.7240	4085.37	OT-C530-BLDGCOR	672343.4782	1692187.1503
473	672538.9710	1692663.8680	4085.27	OT-C530-BLDGCOR	672344.0550	1692173.2983
474	672478.3960	1692731.8290	4085.45	OT-C530-BLDGCOR	672283.4976	1692241.2396
475	672485.2490	1692739.1720	4085.12	OT-C530-BLDGCOR	672290.3486	1692248.5805
476	685978.3640	1686617.0530	4101.95	OT-C534-STATION1	685779.5530	1686128.2358
477	685949.9370	1686623.2970	4101.80	OT-C534-STATION2	685751.1342	1686134.4780
478	686041.6810	1686591.0650	4102.58	OT-C534-BLDGCOR	685842.8517	1686102.2553
479	686050.4200	1686580.6970	4102.78	OT-C534-BLDGCOR	685851.5881	1686091.8903
480	686053.7100	1686616.8100	4102.90	OT-C534-BLDGCOR	685854.8772	1686127.9929
481	686043.1140	1686607.6280	4102.82	OT-C534-BLDGCOR	685844.2842	1686118.8135
482	670482.5190	1680558.2400	4050.60	TU/US-C506-MW3-CASIN	670288.1990	1680071.1788
483	670482.3210	1680558.1750	4050.11	TU/US-C506-MW3-PVC	670288.0011	1680071.1138
484	669451.6250	1685381.2210	4054.88	TU/US-C515-STATION1	669257.6038	1684892.7620
485	669456.5920	1685373.9060	4054.66	TU/US-C515-STATION2	669262.5694	1684885.4491
486	669447.7270	1685364.3830	4054.13	TU/US-C515-STATION3	669253.7069	1684875.9289
487	669442.7430	1685375.3260	4054.34	TU/US-C515-STATION4	669248.7244	1684886.8687
488	669450.0780	1685373.9310	4054.62	TU/US-C515-STATION5	669256.0572	1684885.4741
489	669529.8630	1685390.3120	4053.57	TU/US-C515-MW3-PVC	669335.8191	1684901.8503
490	669530.0710	1685390.1630	4053.84	TU/US-C515-MW3-CASIN	669336.0271	1684901.7014
491	669347.3380	1685357.3580	4053.37	TU/US-C515-MW2-CASIN	669153.3470	1684868.9059
492	669347.0390	1685357.4240	4052.93	TU/US-C515-MW2-PVC	669153.0481	1684868.9719
493	669367.7310	1685396.1250	4053.43	TU/US-C515-MW1-PVC	669173.7341	1684907.6617
494	669368.0180	1685396.0880	4053.86	TU/US-C515-MW1-CASIN	669174.0210	1684907.6247
495	669413.7390	1685386.4140	4054.97	TU/US-C515-BLDGCOR	669219.7288	1684897.9535
496	669405.0760	1685397.5400	4056.39	TU/US-C515-BLDGCOR	669211.0683	1684909.0762
497	669442.6490	1685383.8010	4054.90	TU/US-C515-TANKPIT	669248.6304	1684895.3412
498	669458.4310	1685381.6630	4055.08	TU/US-C515-TANKPIT	669264.4078	1684893.2039
499	669454.7400	1685363.6010	4054.47	TU/US-C515-TANKPIT	669260.7179	1684875.1471
500	669440.8050	1685364.3540	4054.07	TU/US-C515-TANKPIT	669246.7869	1684875.8999
501	669474.3460	1685377.9770	4054.82	TU/US-C515-BLDGCOR	669280.3182	1684889.5189
502	669485.4880	1685386.3880	4055.07	TU/US-C515-BLDGCOR	669291.4570	1684897.9275
503	669257.8420	1685415.0700	4053.20	TU/US-C513-STATION3	669063.8770	1684926.6012
504	669241.6200	1685431.8260	4053.43	TU/US-C513-STATION2	669047.6597	1684943.3523
505	669234.6840	1685421.2410	4053.75	TU/US-C513-STATION5	669040.7257	1684932.7704
506	669232.2550	1685409.8190	4053.42	TU/US-C513-STATION4	669038.2974	1684921.3517

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

Corrections

Point #515
TU/US-515-MW3 PVC

Point #518
TU/US-515-MW2

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
507	669220.1400	1685422.8010	4053.52	TU/US-C513-STATION1	669026.1859	1684934.3299
508	669222.4590	1685431.2530	4053.64	TU/US-C513-TANKPIT	669028.5042	1684942.7795
509	669219.3990	1685411.0450	4054.92	TU/US-C513-TANKPIT	669025.4451	1684922.5773
510	669260.7320	1685426.0370	4053.70	TU/US-C513-TANKPIT	669066.7661	1684937.5650
511	669277.6950	1685433.5720	4053.31	TU/US-C513-MW2-CASIN	669083.7242	1684945.0978
512	669243.5650	1685418.8110	4054.36	TU/US-C513-TRANSPAD	669049.6041	1684930.3411
513	669236.4970	1685419.8090	4054.30	TU/US-C513-TRANSPAD	669042.5381	1684931.3388
514	669235.5680	1685411.9050	4054.57	TU/US-C513-TRANSPAD	669041.6094	1684923.4371
515	669277.6850	1685433.6210	4053.26	TU/US-C513-MW2-C[illegible] PVC	669083.7142	1684945.1468 → MW3
516	669188.9570	1685441.5400	4053.76	TU/US-C513-MW1-CASIN	668995.0119	1684953.0635
517	669188.7180	1685441.6230	4053.31	TU/US-C513-MW1-PVC	668994.7730	1684953.1465
518	669175.0530	1685411.5360	4053.78	TU/US-C513-MW3-PVC	668981.1120	1684923.0682 → MW2
519	669175.2900	1685411.4450	4054.15	TU/US-C513-MW3-CASIN	668981.3489	1684922.9772
520	669194.6820	1685411.4540	4054.72	TU/US-C513-BLDGCOR	669000.7353	1684922.9862
521	669205.8290	1685420.1440	4054.47	TU/US-C513-BLDGCOR	669011.8790	1684931.6737
522	669292.6520	1685418.3920	4053.83	TU/US-C513-BLDGCOR	669098.6769	1684929.9222
523	669293.9380	1685428.2990	4053.77	TU/US-C513-BLDGCOR	669099.9625	1684939.8263
524	685879.9040	1686627.7590	4102.02	OTC-534-CASING	685681.1215	1686138.9387
525	685879.6290	1686627.7910	4101.61	OTC-534-PVC	685680.8466	1686138.9707
526	685894.0510	1686651.2940	4102.15	OTC-534-MW6-CASING	685695.2644	1686162.4669
527	685893.7240	1686651.3020	4101.74	OTC-534-MW6-PVC	685694.9375	1686162.4749
528	685866.3710	1686655.8860	4101.59	OTC-534-MW8-PVC	685667.5925	1686167.0576
529	685866.6060	1686655.6520	4102.06	OTC-534-MW8-CASING	685667.8274	1686166.8236
530	685876.1160	1686687.3140	4102.11	OTC-534-MW5-CASING	685677.3346	1686198.4764
531	685875.8760	1686687.4250	4101.81	OTC-534-MW5-PVC	685677.0947	1686198.5874
532	685834.9910	1686704.4610	4101.83	OTC-534-MW9-PVC	685636.2216	1686215.6185
533	685835.2820	1686704.5300	4102.15	OTC-534-MW9-CASING	685636.5125	1686215.6875
534	685772.4780	1686595.2240	4101.45	OTC-534-MW10-NG	685573.7267	1686106.4131
535	669081.1480	1678793.1860	4046.72	OTC-531B-SEPTANK	668887.2342	1678306.6363
536	669082.4390	1678801.3130	4046.63	OTC-531B-SEPTANK	668888.5248	1678314.7610
537	669072.3810	1678802.9790	4046.81	OTC-531B-SEPTANK	668878.4697	1678316.4265
538	669070.8860	1678795.3530	4046.82	OTC-531B-SEPTANK	668876.9751	1678308.8027
539	669104.1410	1678787.7690	4045.69	OTC-531B-STATION-1	668910.2205	1678301.2209
540	669070.9690	1678801.9800	4046.52	OTC-531B-STATION-2	668877.0581	1678315.4278
541	669061.4820	1678787.2510	4046.24	OTC-531B-STATION-3	668867.5739	1678300.7031
542	669022.2810	1678760.4940	4045.98	OTC-531B-MW-1-PVC	668828.3842	1678273.9538
543	669022.4740	1678760.4670	4046.35	OTC-531B-MW-1-CASING	668828.5772	1678273.9268
544	669029.7060	1678750.8610	4046.12	OTC-531B-LEACH	668835.8071	1678264.3236
545	669044.0770	1678753.3070	4046.04	OTC-531B-LEACH	668850.1739	1678266.7689
546	669048.2090	1678762.3910	4046.19	OTC-531B-LEACH	668854.3047	1678275.8503
547	669052.8600	1678773.5200	4046.17	OTC-531B-LEACH	668858.9544	1678286.9760
548	669051.8580	1678782.0380	4046.19	OTC-531B-LEACH	668857.9527	1678295.4916
549	669045.9680	1678791.0410	4045.97	OTC-531B-LEACH	668852.0644	1678304.4920
550	669037.6080	1678787.3270	4046.05	OTC-531B-LEACH	668843.7068	1678300.7790
551	669030.8940	1678787.9690	4046.07	OTC-531B-LEACH	668836.9947	1678301.4208
552	669024.6850	1678794.4050	4045.99	OTC-531B-LEACH	668830.7875	1678307.8550
553	669012.0060	1678808.0140	4045.98	OTC-531B-LEACH	668818.1122	1678321.4600
554	669005.0390	1678788.3970	4045.95	OTC-531B-LEACH	668811.1472	1678301.8487
555	669008.1540	1678771.5710	4046.05	OTC-531B-LEACH	668814.2613	1678285.0276
556	669012.3090	1678761.0960	4046.10	OTC-531B-LEACH	668818.4151	1678274.5556
557	669052.5660	1678784.6580	4046.08	OTC-531B-FLINE	668858.6605	1678298.1108
558	669071.4380	1678798.9230	4046.55	OTC-531B-FLINE	668877.5270	1678312.3717
559	669082.2160	1678797.7200	4046.58	OTC-531B-ELINE	668888.3019	1678311.1690
560	669109.7160	1678792.3340	4045.64	OTC-531B-ELINE	668915.7939	1678305.7846
561	669130.6340	1678787.5660	4047.05	OTC-531B-ELINE	668936.7058	1678301.0180
562	669132.6960	1678800.0880	4046.87	OTC-531B-BLDGCOR	668938.7672	1678313.5363
563	669139.6540	1678804.9540	4046.97	OTC-531B-BLDGCOR	668945.7232	1678318.4009
564	669127.3740	1678771.5760	4046.72	OTC-531B-BLDGCOR	668933.4468	1678285.0326
565	669131.8520	1678764.6150	4047.25	OTC-531B-BLDGCOR	668937.9235	1678278.0736
566	668593.1300	1678901.9680	4046.19	OTC-531C-BLDGCOR	668399.3576	1678415.3868
567	668588.1250	1678902.8360	4046.21	OTC-531C-BLDGCOR	668394.3541	1678416.2546
568	668585.3350	1678865.5840	4046.55	OTC-531C-BLDGCOR	668391.5649	1678379.0133
569	668590.1110	1678858.6070	4046.53	OTC-531C-BLDGCOR	668396.3395	1678372.0384
570	668590.3090	1678889.4560	4045.95	OTC-531C-ELINE	668396.5374	1678402.8784
571	668578.4210	1678891.4650	4046.03	OTC-531C-ELINE	668384.6529	1678404.8868
572	668560.7680	1678894.7530	4045.47	OTC-531C-ELINE	668367.0050	1678408.1739
573	668535.6480	1678899.2930	4046.35	OTC-531C-ELINE	668341.8923	1678412.7126
574	668535.0660	1678896.4960	4046.68	OTC-531C-SEPTIC	668341.3104	1678409.9164
575	668535.3940	1678905.9700	4046.47	OTC-531C-SEPTIC	668341.6383	1678419.3876
576	668522.2510	1678906.9450	4046.51	OTC-531C-SEPTIC	668328.4992	1678420.3624
577	668522.3100	1678897.4040	4046.39	OTC-531C-SEPTIC	668328.5581	1678410.8241

RAW DATA

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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
578	668561.9930	1678890.5660	4045.66	OTC-531C-STATION-1	668368.2296	1678403.9881
579	668531.2500	1678902.0810	4046.55	OTC-531C-STATION-2	668337.4955	1678415.4998
580	668522.9580	1678893.5110	4045.84	OTC-531C-STATION-3	668329.2059	1678406.9323
581	668521.6100	1678902.7660	4046.16	OTC-531C-FLINE	668327.8583	1678416.1846
582	668515.2610	1678901.5740	4045.66	OTC-531C-FLINE	668321.5112	1678414.9929
583	668515.8520	1678907.4010	4045.67	OTC-531C-LEACH	668322.1020	1678420.8182
584	668498.6960	1678906.8280	4045.81	OTC-531C-LEACH	668304.9510	1678420.2454
585	668489.9270	1678907.6430	4045.74	OTC-531C-LEACH	668296.1845	1678421.0602
586	668481.5760	1678902.8790	4045.69	OTC-531C-LEACH	668287.8359	1678416.2975
587	668476.1180	1678891.3230	4045.84	OTC-531C-LEACH	668282.3795	1678404.7449
588	668473.4290	1678883.0340	4045.68	OTC-531C-LEACH	668279.6913	1678396.4583
589	668473.7340	1678874.2510	4045.53	OTC-531C-LEACH	668279.9962	1678387.6778
590	668476.2360	1678867.2340	4045.54	OTC-531C-LEACH	668282.4975	1678380.6629
591	668482.1720	1678868.3950	4045.45	OTC-531C-MW-1-PVC	668288.4318	1678381.8235
592	668482.4510	1678868.3680	4045.85	OTC-531C-MW-1-CASING	668288.7107	1678381.7965
593	668490.9400	1678863.0190	4045.60	OTC-531C-LEACH	668297.1972	1678376.4491
594	668503.3450	1678866.8310	4045.87	OTC-531C-LEACH	668309.5986	1678380.2600
595	668508.4050	1678874.1920	4045.93	OTC-531C-LEACH	668314.6572	1678387.6189
596	668515.8970	1678879.7420	4045.82	OTC-531C-LEACH	668322.1470	1678393.1672
597	668524.3970	1678890.3500	4045.70	OTC-531C-LEACH	668330.6445	1678403.7722
598	667495.6300	1679128.7300	4042.53	OTC-532-BLDGCOR	667302.1757	1678642.0831
599	667488.6400	1679123.9580	4042.71	OTC-532-BLDGCOR	667295.1877	1678637.3125
600	667462.6660	1679059.4970	4041.10	OTC-532-BLDGCOR	667269.2212	1678572.8701
601	667481.1840	1679050.1710	4042.61	OTC-532-BLDGCOR	667287.7339	1678563.5469
602	667486.0130	1679106.7520	4042.73	OTC-532-ELINE	667292.5615	1678620.1115
603	667462.4800	1679111.5030	4040.38	OTC-532-ELINE	667269.0353	1678624.8611
604	667462.2250	1679114.4150	4040.62	OTC-532-STATION-1	667268.7804	1678627.7722
605	667442.0090	1679119.1410	4041.24	OTC-532-STATION-2	667248.5702	1678632.4969
606	667419.1640	1679115.1840	4040.86	OTC-532-STATION-3	667225.7319	1678628.5410
607	667385.6930	1679101.6040	4040.50	OTC-532-STATION-4	667192.2706	1678614.9649
608	667381.8850	1679101.5680	4040.62	OTC-532-LEACH	667188.4637	1678614.9290
609	667383.6400	1679091.6130	4040.63	OTC-532-LEACH	667190.2181	1678604.9768
610	667385.4250	1679087.0370	4040.57	OTC-532-LEACH	667192.0026	1678600.4022
611	667388.9960	1679084.4040	4040.65	OTC-532-LEACH	667195.5726	1678597.7699
612	667394.2390	1679084.6140	4040.73	OTC-532-LEACH	667200.8141	1678597.9799
613	667396.1210	1679092.7430	4040.70	OTC-532-LEACH	667202.6955	1678606.1065
614	667398.1240	1679100.9150	4040.70	OTC-532-LEACH	667204.6979	1678614.2761
615	667402.2360	1679106.9240	4040.75	OTC-532-LEACH	667208.8088	1678620.2834
616	667410.1270	1679109.8530	4040.82	OTC-532-LEACH	667216.6975	1678623.2116
617	667419.4540	1679110.1630	4040.85	OTC-532-LEACH	667226.0218	1678623.5215
618	667420.7270	1679120.1400	4041.02	OTC-532-FLINE	667227.2944	1678633.4956
619	667423.8510	1679141.7780	4040.59	OTC-532-LEACH	667230.4175	1678655.1273
620	667412.2990	1679143.4760	4040.74	OTC-532-LEACH	667218.8688	1678656.8248
621	667403.7350	1679143.1670	4040.80	OTC-532-LEACH	667210.3073	1678656.5159
622	667397.0900	1679139.6510	4040.75	OTC-532-LEACH	667203.6642	1678653.0009
623	667384.3300	1679127.9250	4040.44	OTC-532-LEACH	667190.9079	1678641.2783
624	667382.6070	1679116.1130	4040.44	OTC-532-LEACH	667189.1854	1678629.4697
625	667430.4810	1679118.6630	4041.32	OTC-532-FLINE	667237.0456	1678632.0190
626	667430.2210	1679114.2980	4041.25	OTC-532-SEPTIC	667236.7856	1678627.6553
627	667440.5880	1679113.0200	4041.26	OTC-532-SEPTIC	667247.1496	1678626.3776
628	667442.9470	1679123.3120	4041.21	OTC-532-SEPTIC	667249.5080	1678636.6667
629	667430.1210	1679125.8580	4041.28	OTC-532-SEPTIC	667236.6857	1678639.2119
630	667441.8110	1679116.2010	4041.27	OTC-532-ELINE	667248.3723	1678629.5577
631	669659.5140	1678688.1920	4048.05	OTC-531A-ELINE	669465.4326	1678201.6728
632	669645.1200	1678691.4170	4047.42	OTC-531A-ELINE	669451.0427	1678204.8968
633	669626.5240	1678694.6570	4048.54	OTC-531A-ELINE	669432.4521	1678208.1359
634	669625.4550	1678690.5680	4048.58	OTC-531A-SEPTIC	669431.3834	1678204.0481
635	669627.0130	1678697.2200	4048.59	OTC-531A-SEPTIC	669432.9410	1678210.6981
636	669614.1180	1678700.1730	4048.60	OTC-531A-SEPTIC	669420.0497	1678213.6503
637	669613.0940	1678693.8150	4048.72	OTC-531A-SEPTIC	669419.0260	1678207.2941
638	669648.5430	1678685.0250	4047.24	OTC-531A-STATION-1	669454.4647	1678198.5067
639	669615.3510	1678691.9600	4048.59	OTC-531A-STATION-2	669421.2823	1678205.4397
640	669607.0140	1678691.1700	4048.42	OTC-531A-STATION-3	669412.9478	1678204.6499
641	669606.7200	1678688.2040	4048.56	OTC-531A-LEACH	669412.6539	1678201.6848
642	669608.9270	1678706.1330	4048.28	OTC-531A-LEACH	669414.8602	1678219.6086
643	669601.3790	1678707.8980	4048.13	OTC-531A-LEACH	669407.3144	1678221.3730
644	669593.2420	1678708.2220	4047.49	OTC-531A-LEACH	669399.1798	1678221.6970
645	669578.1380	1678708.5010	4047.22	OTC-531A-LEACH	669384.0801	1678221.9759
646	669565.0490	1678706.1840	4047.29	OTC-531A-LEACH	669370.9949	1678219.6595
647	669554.2260	1678694.3690	4047.37	OTC-531A-LEACH	669360.1751	1678207.8480
648	669553.4160	1678687.6760	4047.59	OTC-531A-LEACH	669359.3653	1678201.1569

RAW DATA

HOLLOMAN AIR FORCE BASE
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POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
649	669552.5940	1678678.4030	4047.76	OTC-531A-LEACH	669358.5435	1678191.8866
650	669550.0120	1678656.4050	4047.76	OTC-531A-LEACH	669355.9623	1678169.8950
651	669556.1880	1678652.3190	4047.86	OTC-531A-LEACH	669362.1365	1678165.8102
652	669559.2580	1678655.8340	4047.38	OTC-531A-MW-1-PVC	669365.2056	1678169.3241
653	669559.5100	1678655.7600	4047.78	OTC-531A-MW-1-CASING	669365.4575	1678169.2502
654	669561.9190	1678650.8880	4047.69	OTC-531A-LEACH	669367.8658	1678164.3796
655	669569.0970	1678659.8040	4048.02	OTC-531A-LEACH	669375.0418	1678173.2930
656	669574.5390	1678669.0420	4047.77	OTC-531A-LEACH	669380.4822	1678182.5283
657	669580.0480	1678677.6210	4047.77	OTC-531A-LEACH	669385.9896	1678191.1048
658	669581.1180	1678685.2190	4047.72	OTC-531A-LEACH	669387.0593	1678198.7006
659	669589.3790	1678690.0080	4047.91	OTC-531A-LEACH	669395.3179	1678203.4882
660	669598.7410	1678687.4540	4047.88	OTC-531A-LEACH	669404.6772	1678200.9350
661	669608.6000	1678697.8630	4048.38	OTC-531A-FLINE	669414.5333	1678211.3410
662	669613.4950	1678697.0050	4048.61	OTC-531A-FLINE	669419.4269	1678210.4832
663	669434.7190	1685385.1220	4055.15	US/TC-515-EXAVATION	669240.7027	1684896.6618
664	669433.7320	1685375.0770	4054.68	US/TC-515-EXAVATION	669239.7160	1684886.6198
665	669453.6100	1685372.2880	4054.89	US/TC-515-EXAVATION	669259.5882	1684883.8316
666	669455.2490	1685382.6100	4055.08	US/TC-515-EXAVATION	669261.2268	1684894.1506
667	669423.1290	1685379.3360	4054.73	US/TC-515-POTHOLE-1	669229.1161	1684890.8775
668	669443.7270	1685362.1260	4054.20	US/TC-515-POTHOLE-2	669249.7081	1684873.6725
669	669443.2340	1685352.4030	4053.69	US/TC-515-POTHOLE-3	669249.2152	1684863.9523
670	669388.8600	1685382.9350	4054.36	US/TC-515-POTHOLE-4	669194.8570	1684894.4755
671	666075.3380	1693454.3920	4059.75	US/TC-502-TANK/EX	665882.2953	1692963.5932
672	666064.5480	1693454.6090	4059.59	US/TC-502-TANK/EX	665871.5084	1692963.8101
673	666064.5890	1693463.2320	4059.66	US/TC-502-TANK/EX	665871.5494	1692972.4306
674	666075.7420	1693463.6580	4059.85	US/TC-502-TANK/EX	665882.6992	1692972.8565
675	666070.2430	1693458.8620	4059.56	US/TC-502-STATION-1	665877.2018	1692968.0619
676	666075.3470	1693459.1030	4059.61	US/TC-502-STATION-2	665882.3043	1692968.3028
677	666070.4890	1693455.0470	4059.46	US/TC-502-STATION-3	665877.4477	1692964.2480
678	666070.2650	1693463.1340	4059.49	US/TC-502-STATION-4	665877.2238	1692972.3327
679	666072.2440	1693503.2780	4060.12	US/TC-502-FIREHY	665879.2022	1693012.4650
680	669813.9600	1693315.1950	4077.70	US/TC-503-EXAVATION	669619.8338	1692824.4365
681	669826.0790	1693326.7460	4077.45	US/TC-503-EXAVATION	669631.9493	1692835.9842
682	669815.4720	1693337.1950	4077.67	US/TC-503-EXAVATION	669621.3454	1692846.4302
683	669803.8000	1693324.4750	4077.59	US/TC-503-EXAVATION	669609.6767	1692833.7139
684	669818.2990	1693319.1730	4077.48	US/TC-503-BEGTRENCH	669624.1715	1692828.4134
685	669837.0790	1693303.2490	4076.88	US/TC-503-ENDTRENCH	669642.9461	1692812.4940
686	681138.0180	1690539.4590	4109.33	OTC-538-STATION-5	680940.6098	1690049.5050
687	673758.3950	1683356.5480	4060.55	US/TC-514-STATION-1	673563.1256	1682868.6758
688	673765.5540	1683358.1250	4060.47	US/TC-514-STATION-2	673570.2825	1682870.2523
689	673770.0890	1683350.4240	4060.48	US/TC-514-STATION-3	673574.8162	1682862.5535
690	673768.2490	1683354.2670	4060.48	US/TC-514-STATION-4	673572.9768	1682866.3954
691	673777.4280	1683353.4050	4060.71	US/TC-514-STATION-5	673582.1531	1682865.5337
692	673776.8350	1683359.0390	4060.94	US/TC-514-BLDGCOR	673581.5603	1682871.1661
693	673769.7480	1683353.9100	4060.70	US/TC-514-BLDGCOR	673574.4753	1682866.0385
694	673778.8570	1683370.4750	4060.92	US/TC-514-BLDGCOR	673583.5817	1682882.5987
695	673773.9440	1683377.3380	4060.70	US/TC-514-BLDGCOR	673578.6701	1682889.4597
696	673723.3370	1683411.0030	4060.56	US/TC-514-MW-1-PVC	673528.0778	1682923.1150
697	673723.6160	1683410.9000	4061.02	US/TC-514-MW-1-CASIN	673528.3567	1682923.0120
698	673699.2890	1683380.7720	4061.09	US/TC-514-MW-2-CASIN	673504.0367	1682892.8928
699	673698.9660	1683380.8260	4060.66	US/TC-514-MW-2-PVC	673503.7138	1682892.9467
700	673812.5550	1683317.4880	4060.43	US/TC-514-MW-3-PVC	673617.2699	1682829.6271
701	673812.8820	1683317.4350	4060.76	US/TC-514-MW-3-CASIN	673617.5968	1682829.5741
702	673776.7270	1683350.1350	4060.82	US/TC-514-FORM/TANK	673581.4523	1682862.2646
703	673777.3420	1683356.4370	4060.94	US/TC-514-FORM/TANK	673582.0671	1682868.5648
704	673759.1130	1683359.4810	4061.06	US/TC-514-FORM/TANK	673563.8434	1682871.6079
705	673757.7990	1683353.3170	4061.32	US/TC-514-FORM/TANK	673562.5298	1682865.4457
706	678061.9490	1684350.2580	4078.63	US/TC-516-FORMTANK	677865.4323	1683862.0978
707	678072.0100	1684348.4740	4078.61	US/TC-516-FORMTANK	677875.4904	1683860.3143
708	678074.0860	1684360.1530	4078.25	US/TC-516-FORMTANK	677877.5658	1683871.9899
709	678065.1290	1684362.4260	4078.47	US/TC-516-FORMTANK	677868.6114	1683874.2622
710	678069.6040	1684359.8850	4078.30	US/TC-516-STATION-1	677873.0851	1683871.7220
711	678064.5960	1684356.9350	4078.34	US/TC-516-STATION-2	677868.0786	1683868.7728
712	678066.1670	1684350.4200	4078.54	US/TC-516-STATION-3	677869.6491	1683862.2597
713	678072.9250	1684354.8490	4078.09	US/TC-516-STATION-4	677876.4052	1683866.6874
714	678101.7280	1684311.2380	4077.72	US/TC-516-MW-2	677905.1998	1683823.0891
715	678116.9250	1684291.3650	4077.78	US/TC-516-MW-2	677920.3924	1683803.2218
716	678061.7680	1684335.2520	4080.38	US/TC-516-BLDGCOR	677865.2514	1683847.0961
717	678064.6310	1684348.2080	4081.07	US/TC-516-BLDGCOR	677868.1136	1683860.0484
718	678026.7560	1684390.7900	4078.49	US/TC-516-MW-1	677830.2495	1683902.6180
719	678014.0050	1684363.8290	4077.81	US/TC-516-MW-3	677817.5022	1683875.6648

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
720	671269.9880	1692357.3370	4075.08	US/TC-508-FORM/TANK	671075.4398	1691866.8562
721	671299.4450	1692330.8640	4075.18	US/TC-508-FORM/TANK	671104.8883	1691840.3908
722	671324.3300	1692358.5130	4075.17	US/TC-508-FORM/TANK	671129.7661	1691868.0318
723	671294.8560	1692384.8580	4075.02	US/TC-508-FORM/TANK	671100.3006	1691894.3692
724	671311.5950	1692346.0080	4075.12	US/TC-508-STATION-2	671117.0347	1691855.5304
725	671302.2680	1692357.1830	4075.07	US/TC-508-STATION-1	671107.7104	1691866.7022
726	671312.4640	1692368.2800	4074.98	US/TC-508-STATION-4	671117.9035	1691877.7960
727	671282.5110	1692369.9060	4075.01	US/TC-508-STATION-3	671087.9592	1691879.4215
728	671289.2400	1692342.4620	4075.15	US/TC-508-STATION-5	671094.6862	1691851.9855
729	671373.3210	1692386.6060	4075.00	US/TC-508-MW-3-PVC	671178.7429	1691896.1167
730	671373.6120	1692386.5000	4075.33	US/TC-508-MW-3-CASIN	671179.0338	1691896.0107
731	671216.9160	1692488.1670	4075.54	US/TC-508-SS18-MW08-CASIN	671022.3832	1691997.6482
732	671216.7110	1692488.4340	4075.26	US/TC-508-SS18-MW08-PVC	671022.1782	1691997.9152
733	671236.3110	1692301.9320	4075.19	US/TC-508-MW-2-CASIN	671041.7726	1691811.4672
734	671236.1240	1692302.1450	4074.80	US/TC-508-MW-2-PVC	671041.5856	1691811.6801
735	671211.3090	1692324.4610	4075.35	US/TC-508-MW-1-CASIN	671016.7778	1691833.9897
736	671211.0360	1692324.6620	4074.93	US/TC-508-MW-1-PVC	671016.5049	1691834.1906
737	671174.1880	1692241.9700	4074.81	US/TC-508-SS18-MW16-PVC	670979.6676	1691751.5226
738	671174.4770	1692241.7880	4075.34	US/TC-508-SS18-MW16-CASIN	670979.9565	1691751.3406
739	671035.8870	1692106.1030	4074.42	US/TC-508-SS18-MW18-CASIN	670841.4066	1691615.6950
740	671035.6230	1692106.3690	4073.74	US/TC-508-SS18-MW18-PVC	670841.1427	1691615.9609
741	671043.1730	1692355.2630	4075.73	US/TC-508-SS18-MW19-PVC	670848.6905	1691864.7828
742	670383.2120	1691278.5670	4072.57	US/TC-504-MW-2-CASIN	670188.9208	1690788.3988
743	670383.0220	1691278.7790	4072.19	US/TC-504-MW-2-PVC	670188.7309	1690788.6107
744	670343.7050	1691297.2270	4072.57	US/TC-504-MW-1-PVC	670149.4253	1690807.0534
745	670343.9460	1691296.8630	4072.80	US/TC-504-MW-1-CASIN	670149.6662	1690806.6895
746	669680.3630	1678704.0610	4048.54	OTC-531A-BLDGCOR	669486.2755	1678217.5372
747	669673.4280	1678699.1340	4048.44	OTC-531A-BLDGCOR	669479.3425	1678212.6116
748	669662.1160	1678671.3190	4048.32	OTC-531A-BLDGCOR	669468.0338	1678184.8047
749	669671.0810	1678657.6480	4048.29	OTC-531A-BLDGCOR	669476.9962	1678171.1376
750	669671.6690	1678686.6260	4048.54	OTC-531A-ELINE	669477.5840	1678200.1072
751	670995.2900	1691723.6540	4072.55	US/TC-500-STATION-6	670800.8214	1691233.3568
752	682707.7150	1693994.3080	4139.12	OTC-539-SEPTIC	682509.8519	1693503.3527
753	682707.1360	1693987.5070	4139.01	OTC-539-SEPTIC	682509.2731	1693496.5537
754	682713.9270	1693987.3840	4139.07	OTC-539-SEPTIC	682516.0621	1693496.4307
755	682714.4020	1693993.8490	4139.12	OTC-539-SEPTIC	682516.5370	1693502.8939
756	682710.5050	1693994.2530	4139.11	OTC-539-ELINE	682512.6411	1693503.2977
757	682711.7750	1694038.3560	4139.83	OTC-539-ELINE	682513.9107	1693547.3880
758	682709.6340	1694009.1330	4139.38	OTC-539-STATION-1	682511.7704	1693518.1734
759	682715.9010	1693990.7160	4139.12	OTC-539-STATION-2	682518.0355	1693499.7618
760	682707.9950	1693985.7400	4139.05	OTC-539-STATION-3	682510.1318	1693494.7872
761	682690.1540	1693966.7430	4138.58	OTC-539-STATION-4	682492.2960	1693475.7957
762	682700.5510	1693984.6270	4139.10	OTC-539-LEACH	682502.6900	1693493.6745
763	682694.7220	1693978.9800	4138.75	OTC-539-LEACH	682496.8627	1693488.0292
764	682685.8570	1693975.5370	4138.62	OTC-539-LEACH	682488.0002	1693484.5872
765	682686.8260	1693963.6500	4138.56	OTC-539-LEACH	682488.9690	1693472.7036
766	682690.9260	1693959.9730	4138.78	OTC-539-LEACH	682493.0678	1693469.0277
767	682696.9840	1693956.9410	4138.94	OTC-539-LEACH	682499.1240	1693465.9966
768	682705.4410	1693958.5980	4139.12	OTC-539-LEACH	682507.5786	1693467.6531
769	682714.7430	1693968.3290	4139.32	OTC-539-LEACH	682516.8779	1693477.3813
770	682721.4010	1693976.8710	4139.30	OTC-539-LEACH	682523.5339	1693485.9208
771	682717.7930	1693983.8070	4139.35	OTC-539-LEACH	682519.9270	1693492.8548
772	682710.1830	1693984.5790	4139.16	OTC-539-FLINE	682512.3192	1693493.6265
773	682710.2190	1693987.2160	4139.18	OTC-539-FLINE	682512.3552	1693496.2628
774	682690.6020	1694039.4720	4139.43	OTC-539-BLDGCOR	682492.7439	1693548.5036
775	682684.8200	1694045.5030	4139.27	OTC-539-BLDGCOR	682486.9635	1693554.5329
776	682741.4000	1694039.0240	4140.22	OTC-539-BLDGCOR	682543.5271	1693548.0558
777	682747.1830	1694045.0970	4140.68	OTC-539-BLDGCOR	682549.3085	1693554.1270

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7824
PROFESSIONAL SURVEYOR

RAW DATA

HOLLOMAN AIR FORCE BASE
MAIN SITE SURVEY

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
778	686068.4560	1686694.7280	4103.68	OTC-534-MW-10-PVC	685869.6189	1686205.8883
779	686068.7800	1686694.7810	4104.06	OTC-534-MW-10-CASING	685869.9428	1686205.9413
780	685846.6180	1686522.2590	4102.52	OTC-534-MW-11-CASING	685647.8452	1686033.4693
781	685846.3620	1686522.2240	4102.15	OTC-534-MW-11-PVC	685647.5893	1686033.4343
782	685670.3280	1686561.9490	4102.29	OTC-534-MW-12-PVC	685471.6063	1686073.1478
783	685670.6410	1686561.9860	4102.69	OTC-534-MW-12-CASING	685471.9192	1686073.1848

RAW DATA

HOLLOMAN AIR FORCE BASE
WEST SITE

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION	GRID NORTHING	GRID EASTING
1	684793.2210	1611172.5300	3911.93	BASE	684598.9178	1610715.3759
2	682531.9480	1628747.6200	3965.57	EC-30	682338.2864	1628285.4792
3	682452.1330	1628714.0920	3957.20	EC-30-2	682258.4940	1628251.9607
4	698323.2620	1606321.3780	3915.08	CHAS	698125.1198	1605865.6004
5	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
60	616427.1730	1576921.6540	3941.67	LUCERO	616252.2680	1576474.2182
61	600657.7750	1576446.9260	4131.58	GERI	600487.3444	1575999.6249
62	614156.5210	1568701.1170	4227.09	SW 30	613982.2602	1568256.0137
63	575518.1130	1586543.7100	4038.20	BRYCE AZ MK	575354.8155	1586093.5441
64	576512.9440	1582067.6800	4357.70	BRYCE	576349.3642	1581618.7841
65	633185.2600	1566510.7280	4417.64	HORN	633005.6000	1566066.2462
66	580320.9040	1585783.2080	4128.59	NICK 2	580156.2437	1585333.2579
67	682452.1790	1628714.1810	3957.10	EC-30-2	682258.5400	1628252.0496
68	698323.2620	1606321.3780	3914.70	CHAS	698125.1198	1605865.6004
69	698212.0050	1609477.2870	3928.40	CHUCK	698013.8943	1609020.6139
70	682531.9020	1628747.5310	3965.57	EC-30	682338.2404	1628285.3902
71	681800.7610	1605128.9720	3910.25	CINDY	681607.3069	1604673.5327
100	684194.1900	1611160.8710	3912.56	USTC-518-NG	684000.0567	1610703.7202
101	684194.8810	1611165.7430	3912.33	USTC-518-NG	684000.7475	1610708.5908
102	684188.7970	1611168.5190	3912.27	USTC-518-NG	683994.6653	1610711.3660
103	684189.4230	1611176.5450	3912.53	USTC-518-NG	683995.2911	1610719.3898
104	684179.6480	1611178.5150	3912.57	USTC-518-NG	683985.5189	1610721.3592
105	684178.1630	1611171.1680	3912.37	USTC-518-NG	683984.0343	1610714.0143
106	684177.1790	1611163.0630	3913.00	USTC-518-NG	683983.0506	1610705.9116
107	684157.6940	1611173.6700	3912.42	USTC-518-STATION-5	683963.5711	1610716.5156
108	684176.2170	1611179.5100	3912.28	USTC-518-STATION-4	683982.0888	1610722.3539
109	684175.8730	1611172.3430	3912.51	USTC-518-STATION-2	683981.7449	1610715.1890
110	684173.8830	1611163.3430	3912.65	USTC-518-STATION-3	683979.7555	1610706.1915
111	684189.5770	1611170.0220	3912.30	USTC-518-STATION-1	683995.4450	1610712.8686
112	684160.3220	1611172.8640	3912.49	USTC-518-POTHOLE-1	683966.1984	1610715.7098
113	684125.1520	1611185.2360	3910.93	USTC-518-MW-1	683931.0383	1610728.0783
114	684130.9190	1611216.0540	3911.17	USTC-518-MW-2	683936.8037	1610758.8876
115	684158.8770	1611187.1610	3912.34	USTC-518-BLDGCORN-70	683964.7538	1610730.0028
116	684163.9700	1611180.4420	3912.46	USTC-518-BLDGCORN-70	683969.8453	1610723.2857
117	684211.6690	1611174.1790	3912.47	USTC-518-BLDGCORN-70	684017.5308	1610717.0244
118	684218.3800	1611179.3060	3912.45	USTC-518-BLDGCORN-70	684024.2399	1610722.1500
119	684236.0190	1611144.8000	3911.88	USTC-518-NAIL	684041.8739	1610687.6538
120	684242.7800	1611133.9130	3911.77	USTC-518-NAIL	684048.6330	1610676.7699
121	684203.7200	1611162.6570	3912.21	USTC-518-STATION-6	684009.5840	1610705.5057

SURVEYOR'S CERTIFICATION

I, SANTIAGO ROMERO, JR., DO HEREBY CERTIFY THAT I AM A DULY QUALIFIED PROFESSIONAL SURVEYOR REGISTERED UNDER THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE DATA SHOWN HEREON WAS ASSEMBLED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT TO THE BEST OF MY KNOWLEDGE AND BELIEF IS ACCURATELY REPRESENTED.

SANTIAGO ROMERO, JR., NMPS NO. 7924

12/14/2012
DATE

SANTIAGO ROMERO, JR.
NEW MEXICO
7924
PROFESSIONAL SURVEYOR

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-070

Appendix H
Laboratory Analytical Data and Data Validation Checklists

Note: The data validation checklists and laboratory analytical data reports are provided as separate files.

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-070

Appendix I
Waste Manifests

HAFB-001

Generator's Name	Generator's Address	Generator's Telephone No.
USAF	550 TABOSA AVE Holloman AFB NM 88330	575-491-8262

Origin of Special Waste (Project or Spill Location): ~~White Sands National Monument Park - Storage Lagoons~~ Holloman AFB NM Bldg # 55

Transporter #1 Company Name	Address	Telephone No.
Southwest Disposal	1350 LaVelle Road	575-434-1109
Transporter #2 Company Name	Address	Telephone No.
	Alamogordo, NM 88310	

Destination Facility Name/Site Address	Facility ID (Permit) Number	Telephone No.
Otero/Greentree Regional Landfill 24 Mls South of Alamogordo, Hwy 54	SWM-109102	575-439-4355

Type and Proper Name of Special Waste	Container(s) No.	Container(s) Type	Total Quantity	Unit Wt/Vol	
Non RCRA/Non Hazardous Substance ~~(Treatment Plant Lagoon Sludge)~~ (soil)		SD		6.95	Tons

Additional Descriptions for Special Waste Listed Above:

Site Contact: Todd Hiltunen 307-214-6080

Special Handling Instructions:

Southwest Disposal - Lined and Covered Roll-off

GENERATOR'S CERTIFICATION I hereby certify that the contents of this shipment are fully and accurately described above by type and proper name of the special waste, and that such waste has been managed, packaged, containerized and labeled in accordance with the requirements of 20.9.8 NMAC (Special Waste Requirements) in addition to any other applicable federal, state or local regulations.

Truck # 553 Bin #

Printed/Typed Name:	Signature:	Date:
Todd Hiltunen for Brent Hunt (CES)	for Brent Hunt (CES)	9/25/12

Transporter 1 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:
David Gurnbach		9/26/12

Transporter 2 Acknowledgement of Receipt of Special Waste

Printed/Typed Name:	Signature:	Date:

Discrepancy Indication Space:

Analytical supplied to landfill

no facility ID number

Facility Owner or Operator: ***I hereby acknowledge receipt of the special waste as indicated upon this manifest, except as noted above in the Discrepancy Indication Space.***

Printed/Typed Name:	Signature:	Date:
Darrell McGinnis / Attendant		9-26-12

~~Facility~~

OTERO/GREENTREE
REGIONAL LANDFILL

TRANSACTION: 28,080

CO. NAME:

ADDRESS: Environmental Waste Solutions
1348 B. Redtail Hawk Drive

CITY & STATE: Boardman, OH 44512

DATE: 9/26/12 TIME: 9:07 am

TRUCK NO.: 198

GROSS WEIGHT 47000

TARE WEIGHT: 33100

NET TONS: 13900 6.95

COST $: [redacted]

5% TAX $:

TOTAL DUE $:

WASTE: 5

WASTE DESC.: Construction Debris
H.A.F.B.

WASTE ORIGIN:

DRIVER

Contract No. FA8903-09-D-8580, Task Order No. 0013 • Final • Revision 0 • October 2013 • WERC-09-13-070

Appendix J
Risk Evaluation Calculations

Risk Additivity
Soil Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC544-IS-0001-070612		OTC544-IS-0002-070612		OTC544-IS-0003-070612		OTC544-IS-0004-070612		OTC544-IS-0005-070612		OTC544-IS-0006-070612		OTC544-IS-0007-070612		OTC544-IS-0008-070612-FD		OTC544-IS-0009-070612		OTC544-IS-0010-070612		OTC544-IS-0011-070612	
				Sample Date	7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12		0 - 2		14 - 16	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	NE		**79.9**		**82**		**81.9**		**82.8**		**82.2**		**82.5**		**77.5**		**78.7**		**86.8**		**80.2**		**83**	
VOLATILES (mg/kg)																										
1,1,1-TRICHLOROETHANE	NE	8700	15600		0.002	U	0.0012	U	0.0017	U	0.0016	U	0.0018	U	0.0018	U	0.0022	U	0.0015	U	0.0013	U	0.0013	U	0.0015	U
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02		0.0022	U	0.0013	U	0.0018	U	0.0017	U	0.0019	U	0.002	U	0.0024	U	0.0016	U	0.0014	U	0.0014	U	0.0016	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100		0.0031	U	0.0018	U	0.0026	U	0.0024	U	0.0027	U	0.0028	U	0.0034	U	0.0023	U	0.002	U	0.002	U	0.0023	U
1,1,2-TRICHLOROETHANE	NE	1.1	2.81		0.002	U	0.0012	U	0.0017	U	0.0016	U	0.0018	U	0.0018	U	0.0022	U	0.0015	U	0.0013	U	0.0013	U	0.0015	U
1,1-DICHLOROETHANE	NE	3.3	64.5		0.002	U	0.0012	U	0.0017	U	0.0016	U	0.0018	U	0.0018	U	0.0022	U	0.0015	U	0.0013	U	0.0013	U	0.0015	U
1,1-DICHLOROETHENE	NE	240	449		0.0025	U	0.0015	U	0.0021	U	0.002	U	0.0022	U	0.0023	U	0.0028	U	0.0019	U	0.0016	U	0.0016	U	0.0019	U
1,2,4-TRICHLOROBENZENE	NE	22	73.0		0.0022	UJ	0.0013	U	0.0018	U	0.0017	U	0.0019	U	0.002	U	0.0024	U	0.0016	U	0.0014	U	0.0014	U	0.0016	U
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86		0.0042	U	0.0024	U	0.0035	U	0.0033	U	0.0037	U	0.0038	U	0.0046	U	0.0031	U	0.0027	U	0.0026	U	0.0031	U
1,2-DIBROMOETHANE	NE	0.034	0.588		0.0018	U	0.0011	U	0.0015	U	0.0014	U	0.0016	U	0.0017	U	0.002	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
1,2-DICHLOROBENZENE	NE	1900	2310		0.002	U	0.0012	U	0.0017	U	0.0016	U	0.0018	U	0.0018	U	0.0022	U	0.0015	U	0.0013	U	0.0013	U	0.0015	U
1,2-DICHLOROETHANE	NE	0.43	7.89		0.0018	U	0.0011	U	0.0015	U	0.0014	U	0.0016	U	0.0017	U	0.002	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
1,2-DICHLOROPROPANE	NE	0.94	15.2		0.0022	U	0.0013	U	0.0018	U	0.0017	U	0.0019	U	0.002	U	0.0024	U	0.0016	U	0.0014	U	0.0014	U	0.0016	U
1,3-DICHLOROBENZENE	NE	NE	NE		0.0022	U	0.0013	U	0.0018	U	0.0017	U	0.0019	U	0.002	U	0.0024	U	0.0016	U	0.0014	U	0.0014	U	0.0016	U
1,4-DICHLOROBENZENE	NE	2.4	31.7		0.002	UJ	0.0012	U	0.0017	U	0.0016	U	0.0018	U	0.0018	U	0.0022	U	0.0015	U	0.0013	U	0.0013	U	0.0015	U
2-HEXANONE	NE	210	NE		0.0098	U	0.0057	U	0.0081	U	0.0077	U	0.0086	U	0.0089	U	0.011	U	0.0072	U	0.0063	U	0.0062	U	0.0073	U
ACETONE	NE	61000	66600		0.036	U	0.021	U	0.03	U	0.029	U	0.032	U	0.033	U	0.04	U	0.027	U	0.024	U	0.023	U	0.027	U
BENZENE	NE	1.1	15.4		0.0027	U	0.0016	U	0.0023	U	0.0021	U	0.0024	U	0.0025	U	0.003	U	0.002	U	0.0018	U	0.0017	U	0.002	U
BROMODICHLOROMETHANE	NE	0.27	5.41		0.002	U	0.0012	U	0.0017	U	0.0016	U	0.0018	U	0.0018	U	0.0022	U	0.0015	U	0.0013	U	0.0013	U	0.0015	U
BROMOFORM	NE	62	616		0.0027	U	0.0016	U	0.0023	U	0.0021	U	0.0024	U	0.0025	U	0.003	U	0.002	U	0.0018	U	0.0017	U	0.002	U
BROMOMETHANE	NE	7.3	16.5		0.0036	U	0.0021	U	0.003	U	0.0029	U	0.0032	U	0.0033	U	0.004	U	0.0027	U	0.0024	U	0.0023	U	0.0027	U
CARBON DISULFIDE	NE	820	1530		0.0036	U	0.0021	U	0.003	U	0.0029	U	0.0032	U	0.0033	U	0.004	U	0.0027	U	0.0024	U	0.0023	U	0.0027	U
CARBON TETRACHLORIDE	NE	0.61	10.8		0.0033	U	0.0019	U	0.0027	U	0.0026	U	0.0029	U	0.003	U	0.0036	U	0.0024	U	0.0021	U	0.0021	U	0.0024	U
CHLOROBENZENE	NE	290	376		0.0018	U	0.0011	U	0.0015	U	0.0014	U	0.0016	U	0.0017	U	0.002	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
CHLOROETHANE	NE	15000	29800		0.0036	U	0.0021	U	0.003	U	0.0029	U	0.0032	U	0.0033	U	0.004	U	0.0027	U	0.0024	U	0.0023	U	0.0027	U
CHLOROFORM	NE	0.29	5.86		0.0022	U	0.0013	U	0.0018	U	0.0017	U	0.0019	U	0.002	U	0.0024	U	0.0016	U	0.0014	U	0.0014	U	0.0016	U
CHLOROMETHANE	NE	120	275		0.0036	U	0.0021	U	0.003	U	0.0029	U	0.0032	U	0.0033	U	0.004	U	0.0027	U	0.0024	U	0.0023	U	0.0027	U
CIS-1,2-DICHLOROETHYLENE	NE	160	156		0.0027	U	0.0016	U	0.0023	U	0.0021	U	0.0024	U	0.0025	U	0.003	U	0.002	U	0.0018	U	0.0017	U	0.002	U
CIS-1,3-DICHLOROPROPENE	NE	NE	NE		0.0018	U	0.0011	U	0.0015	U	0.0014	U	0.0016	U	0.0017	U	0.002	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
CYCLOHEXANE	NE	7000	NE		0.0025	U	0.0015	U	0.0021	U	0.002	U	0.0022	U	0.0023	U	0.0028	U	0.0019	U	0.0016	U	0.0016	U	0.0019	U
DIBROMOCHLOROMETHANE	NE	0.68	12.1		0.0018	U	0.0011	U	0.0015	U	0.0014	U	0.0016	U	0.0017	U	0.002	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
DICHLORODIFLUOROMETHANE	NE	94	168		0.0027	U	0.0016	U	0.0023	U	0.0021	U	0.0024	U	0.0025	U	0.003	U	0.002	U	0.0018	U	0.0017	U	0.002	U
ETHYLBENZENE	NE	5.4	68.4		0.0018	U	0.0011	U	0.0015	U	0.0014	U	0.0016	U	0.0017	U	0.002	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
ISOPROPYLBENZENE	NE	2100	2430		0.002	U	0.0012	U	0.0017	U	0.0016	U	0.0018	U	0.0018	U	0.0022	U	0.0015	U	0.0013	U	0.0013	U	0.0015	U
METHYL ACETATE	NE	78000	78200		0.023	U	0.013	U	0.019	U	0.018	U	0.02	U	0.021	U	0.025	U	0.017	U	0.015	U	0.014	U	0.017	U
METHYL ETHYL KETONE	NE	28000	37100		0.011	U	0.0065	U	0.0092	U	0.0087	U	0.0097	U	0.01	U	0.012	U	0.0081	U	0.0072	U	0.007	U	0.0082	U
METHYL ISOBUTYL KETONE	NE	5300	5820		0.0099	U	0.0059	U	0.0083	U	0.0079	U	0.0088	U	0.0091	U	0.011	U	0.0073	U	0.0065	U	0.0063	U	0.0074	U
METHYLCYCLOHEXANE	NE	5630	5630		0.0024	U	0.0014	U	0.002	U	0.0019	U	0.0021	U	0.0021	U	0.0026	U	0.0017	U	0.0015	U	0.0015	U	0.0018	U
METHYLENE CHLORIDE	NE	56	409		0.0083	U	0.0049	U	0.0069	U	0.0066	U	0.0073	U	0.0076	U	0.0093	U	0.0061	U	0.0054	U	0.0053	U	0.0062	U

Risk Additivity
Soil Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC544-IS-0001-070612		OTC544-IS-0002-070612		OTC544-IS-0003-070612		OTC544-IS-0004-070612		OTC544-IS-0005-070612		OTC544-IS-0006-070612		OTC544-IS-0007-070612		OTC544-IS-0008-070612-FD		OTC544-IS-0009-070612		OTC544-IS-0010-070612		OTC544-IS-0011-070612	
				Sample Date	7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12		0 - 2		14 - 16	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
VOLATILES - continued (mg/kg)																										
STYRENE	NE	6300	7280		0.0047	U	0.0028	U	0.0039	U	0.0037	U	0.0042	U	0.0043	U	0.0052	U	0.0035	U	0.0031	U	0.003	U	0.0035	U
TERT-BUTYL METHYL ETHER	NE	43	901		0.0036	U	0.0021	U	0.003	U	0.0029	U	0.0032	U	0.0033	U	0.004	U	0.0027	U	0.0024	U	0.0023	U	0.0027	U
TETRACHLOROETHYLENE	NE	22	7.02		0.0018	U	0.0011	U	0.0015	U	0.0014	U	0.0016	U	0.0017	U	0.002	U	0.0013	U	0.0012	U	0.0012	U	0.0013	U
TOLUENE	NE	5000	5270		0.0022	U	0.0013	U	0.0018	U	0.0017	U	0.0019	U	0.002	U	0.0024	U	0.0016	U	0.0014	U	0.0014	U	0.0016	U
TRANS-1,2-DICHLOROETHENE	NE	150	270		0.0027	U	0.0016	U	0.0023	U	0.0021	U	0.0024	U	0.0025	U	0.003	U	0.002	U	0.0018	U	0.0017	U	0.002	U
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE		0.002	U	0.0012	U	0.0017	U	0.0016	U	0.0018	U	0.0018	U	0.0022	U	0.0015	U	0.0013	U	0.0013	U	0.0015	U
TRICHLOROETHYLENE	NE	0.91	8.77		0.0022	U	0.0013	U	0.0018	U	0.0017	U	0.0019	U	0.002	U	0.0024	U	0.0016	U	0.0014	U	0.0014	U	0.0016	U
TRICHLOROFLUOROMETHANE	NE	790	1410		0.0036	U	0.0021	U	0.003	U	0.0029	U	0.0032	U	0.0033	U	0.004	U	0.0027	U	0.0024	U	0.0023	U	0.0027	U
VINYL CHLORIDE	NE	0.06	0.728		0.0027	U	0.0016	U	0.0023	U	0.0021	U	0.0024	U	0.0025	U	0.003	U	0.002	U	0.0018	U	0.0017	U	0.002	U
XYLENES, TOTAL	NE	630	814		0.0058	UJ	0.0034	U	0.0048	U	0.0046	U	0.0051	U	0.0053	U	0.0065	U	0.0043	U	0.0038	U	0.0037	U	0.0043	U
SEMIVOLATILES (mg/kg)																										
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	UJ	0.02	UJ
2,4,5-TRICHLOROPHENOL	NE	6100	6110		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
2,4,6-TRICHLOROPHENOL	NE	44	61.1		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
2,4-DICHLOROPHENOL	NE	180	183		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
2,4-DIMETHYLPHENOL	NE	1200	1220		0.026	U	0.025	U	0.026	U	0.025	U	0.025	U	0.025	U	0.027	U	0.026	U	0.024	U	0.026	U	0.025	U
2,4-DINITROPHENOL	NE	120	122		0.42	U	0.4	U	0.41	U	0.4	U	0.4	U	0.4	U	0.42	U	0.42	U	0.38	U	0.42	U	0.4	U
2,4-DINITROTOLUENE	NE	1.6	15.7		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
2,6-DINITROTOLUENE	NE	61	61.1		0.025	U	0.024	U	0.024	U	0.024	U	0.024	U	0.024	U	0.025	U	0.025	U	0.023	U	0.025	U	0.024	U
2-CHLORONAPHTHALENE	NE	6300	6260		0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
2-CHLOROPHENOL	NE	390	391		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
2-METHYLNAPHTHALENE	NE	230	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
2-METHYLPHENOL	NE	3100	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
2-NITROANILINE	NE	610	NE		0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
2-NITROPHENOL	NE	NE	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8		0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
3-NITROANILINE	NE	NE	NE		0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89		0.083	U	0.08	U	0.081	U	0.08	U	0.081	U	0.081	U	0.085	U	0.084	U	0.077	U	0.083	U	0.08	U
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
4-CHLORO-3-METHYLPHENOL	NE	6100	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
4-CHLOROANILINE	NE	2.4	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
4-NITROANILINE	NE	24	NE		0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
4-NITROPHENOL	NE	NE	NE		0.17	U	0.16	U	0.16	U	0.16	U	0.16	U	0.16	U	0.17	U	0.17	U	0.15	U	0.17	U	0.16	U
ACENAPHTHENE	NE	3400	3440		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
ACENAPHTHYLENE	NE	NE	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
ACETOPHENONE	NE	7800	7820		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
ANTHRACENE	NE	17000	17200		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
ATRAZINE	NE	2.1	NE		0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U

Risk Additivity
Soil Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC544-IS-0001-070612		OTC544-IS-0002-070612		OTC544-IS-0003-070612		OTC544-IS-0004-070612		OTC544-IS-0005-070612		OTC544-IS-0006-070612		OTC544-IS-0007-070612		OTC544-IS-0008-070612-FD		OTC544-IS-0009-070612		OTC544-IS-0010-070612		OTC544-IS-0011-070612	
				Sample Date	7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12		0 - 2		14 - 16	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
SEMIVOLATILES - continued (mg/kg)																										
BENZALDEHYDE	NE	7800	NE	0.21	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.21	U	0.21	U	0.19	U	0.21	U	0.2	U
BENZO(A)ANTHRACENE	NE	0.15	1.48	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
BENZO(A)PYRENE	NE	0.015	0.148	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
BENZO(B)FLUORANTHENE	NE	0.15	1.48	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
BENZO(G,H,I)PERYLENE	NE	NE	NE	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
BENZO(K)FLUORANTHENE	NE	1.5	14.8	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
BENZYL BUTYL PHTHALATE	NE	260	NE	0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
BIPHENYL	NE	51	57.1	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	**0.144**	J	0.08	U	0.081	U	0.08	U	0.081	U	0.081	U	0.085	U	0.084	U	0.077	U	0.083	U	0.08	U
CAPROLACTAM	NE	31000	NE	0.067	U	0.064	U	0.065	U	0.064	U	0.065	U	0.065	U	0.068	U	0.067	U	0.061	U	0.067	U	0.064	U
CARBAZOLE	NE	NE	NE	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
CHRYSENE	NE	15	148	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
DIBENZOFURAN	NE	78	NE	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
DIETHYL PHTHALATE	NE	49000	48900	0.083	U	0.08	U	0.081	U	0.08	U	0.081	U	0.081	U	0.085	U	0.084	U	0.077	U	0.083	U	0.08	U
DIMETHYL PHTHALATE	NE	611000	611000	0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
DI-N-BUTYL PHTHALATE	NE	6100	6110	0.083	U	0.08	U	0.081	U	0.08	U	0.081	U	0.081	U	0.085	U	0.084	U	0.077	U	0.083	U	0.08	U
DI-N-OCTYLPHTHALATE	NE	730	NE	0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
FLUORANTHENE	NE	2300	2290	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
FLUORENE	NE	2300	2290	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
HEXACHLOROBENZENE	NE	0.3	3.04	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
HEXACHLOROBUTADIENE	NE	6.2	61.1	0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
HEXACHLOROCYCLOPENTADIENE	NE	370	367	0.091	U	0.088	U	0.09	U	0.088	U	0.089	U	0.089	U	0.093	U	0.092	U	0.084	U	0.091	UJ	0.088	UJ
HEXACHLOROETHANE	NE	12	42.8	0.042	U	0.04	U	0.041	U	0.04	U	0.04	U	0.04	U	0.042	U	0.042	U	0.038	U	0.042	U	0.04	U
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
ISOPHORONE	NE	510	5120	0.021	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.02	UJ	0.021	UJ	0.021	UJ	0.019	UJ	0.021	UJ	0.02	UJ
M,P-CRESOL	NE	NE	NE	0.03	U	0.029	U	0.029	U	0.029	U	0.029	U	0.029	U	0.03	U	0.03	U	0.028	U	0.03	U	0.029	U
NAPHTHALENE	NE	3.6	43.0	0.033	U	0.032	U	0.033	U	0.032	U	0.032	U	0.032	U	0.034	U	0.034	U	0.031	U	0.033	U	0.032	U
NITROBENZENE	NE	4.8	53.5	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
N-NITROSODIPHENYLAMINE	NE	99	993	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
PENTACHLOROPHENOL	NE	0.89	8.94	0.25	U	0.24	U	0.24	U	0.24	U	0.24	U	0.24	U	0.25	U	0.25	U	0.23	U	0.25	U	0.24	U
PHENANTHRENE	NE	1830	1830	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
PHENOL	NE	18000	18300	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U
PYRENE	NE	1700	1720	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.021	U	0.021	U	0.019	U	0.021	U	0.02	U

Risk Additivity
Soil Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number		OTC544-IS-0001-070612		OTC544-IS-0002-070612		OTC544-IS-0003-070612		OTC544-IS-0004-070612		OTC544-IS-0005-070612		OTC544-IS-0006-070612		OTC544-IS-0007-070612		OTC544-IS-0008-070612-FD		OTC544-IS-0009-070612		OTC544-IS-0010-070612		OTC544-IS-0011-070612	
				Sample Date		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012	
				Location		Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)		3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12		0 - 2		14 - 16	
				Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
EXPLOSIVES (mg/kg)																											
1,3,5-TRINITROBENZENE	NE	2200.0	NE	0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U		
1,3-DINITROBENZENE	NE	6.10	NE	0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U		
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U		
2,4-DINITROTOLUENE	NE	1.60	15.7	0.078	U	0.089	U	0.084	U	0.094	U	0.082	U	0.084	U	0.091	U	0.089	U	0.089	U	0.082	U	0.069	U		
2,6-DINITROTOLUENE	NE	61.0	61.1	0.07	U	0.08	U	0.076	U	0.084	U	0.073	U	0.075	U	0.082	U	0.08	U	0.08	U	0.074	U	0.062	U		
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U		
2-NITROTOLUENE	NE	2.90	29.1	0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U		
3-NITROTOLUENE	NE	6.10	7.82	0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U		
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U		
4-NITROTOLUENE	NE	30.0	244.4	0.081	U	0.093	U	0.088	U	0.098	U	0.085	U	0.087	U	0.095	U	0.093	U	0.093	U	0.086	U	0.072	U		
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U		
NITROBENZENE	NE	4.80	53.5	0.075	U	0.085	U	0.081	U	0.09	U	0.078	U	0.081	U	0.087	U	0.085	U	0.085	U	0.079	U	0.066	U		
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U		
TETRYL	NE	240.0	244.0	0.065	U	0.073	U	0.07	U	0.077	U	0.067	U	0.069	U	0.075	U	0.073	U	0.073	U	0.068	U	0.057	U		
METALS (mg/kg)																											
ALUMINUM	13722	77000	78000	**2460**		**1820**		**5770**		**2070**		**3700**		**2120**		**1290**		**1500**		**979**		**2310**		**7000**			
ANTIMONY	1.6	31	31.3	1.1	U	1.2	U	1.2	U	1.1	U	0.99	U	**3.9**	J	1	U	**3.7**	J	1.2	U	1.1	U	1.1	U		
ARSENIC	3.7	0.39	3.90	1.1	U	1.2	U	**1.4**	J	1.1	U	0.99	U	0.77	U	1	U	0.89	U	1.2	U	1.1	U	1.1	U		
BARIUM	169.3	15000	15600	**32.2**	J	**19.6**	J	**41.8**	J	**22.4**	J	**42.9**	J	**19**	J	**25.6**	J	**27.8**	J	**13.1**	J	**29.2**	J	**60.7**	J		
BERYLLIUM	1.6	160	156	0.55	U	0.6	U	0.6	U	0.57	U	0.49	U	0.39	U	0.51	U	0.44	U	0.58	U	0.53	U	0.57	U		
CADMIUM	0.3	70	70.3	0.55	U	0.6	U	0.6	U	0.57	U	0.49	U	0.77	U	0.51	U	0.89	U	0.58	U	0.53	U	0.57	U		
CALCIUM	317332	NE	NE	**214000**		**199000**		**218000**		**237000**		**231000**		**239000**		**263000**		**266000**		**166000**		**251000**		**132000**			
CHROMIUM[d]	25	117000	117000	**2.4**	J	**2.6**	J	**6.1**		**3.9**	J	**3.5**	J	**1.7**	J	**0.99**	J	0.89	U	**1**	J	**1.7**	J	**9.7**			
COBALT	7.7	23	NE	**0.83**	J	0.6	U	**1.9**	J	**0.8**	J	**1.2**	J	**0.64**	J	0.51	U	**0.55**	J	**1.5**	J	**0.87**	J	**2.6**	J		
COPPER	13	3100	3130	**2**	J	1.2	U	**2.2**	J	**1.5**	J	**1.8**	J	0.77	U	**1.7**	J	**1.8**	J	1.2	U	**2.2**	J	**4.4**	J		
IRON	23049	55000	54800	**2160**		**1960**		**5530**		**2280**		**3490**		**2210**		**1050**		**1240**		**1360**		**1870**		**5640**			
LEAD	10.9	400	400	**1.1**	J	**1.3**	J	**3**	J	**1.3**	J	**1.8**	J	**1.2**	J	0.51	U	0.89	U	0.58	U	**0.64**	J	**3.9**	J		
MAGNESIUM	16991	NE	NE	**5120**		**1620**	J	**3380**		**1670**	J	**4520**		**1320**	J	**4110**		**4260**		**713**	J	**4330**		**3830**			
MANGANESE	393	1800	1860	**47.1**		**28.3**		**72.7**		**40.4**		**66.5**		**50.9**		**20.4**		**23.3**		**66**		**40.5**		**91.2**			
MERCURY	0.0108	10	15.6	0.0099	U	0.0095	U	0.0098	U	0.0094	U	0.0098	U	0.0092	U	0.0099	U	0.01	U	0.0091	U	0.01	U	0.0094	U		
NICKEL	17.4	1500	1560	**1.7**	J	**1.5**	J	**5**	J	**1.9**	J	**2.6**	J	**1.5**	J	**1.2**	J	**1.3**	J	**1.2**	J	**1.7**	J	**6.4**	J		
POTASSIUM	5077	NE	NE	**610**	J	**537**	J	**1760**	J	**593**	J	**930**	J	**643**	J	**432**	J	**468**	J	290	U	**614**	J	**1600**	J		
SELENIUM	1.4	390	391	2.2	U	2.4	U	2.4	U	2.3	U	2	U	3.1	U	2	U	3.6	U	2.3	U	2.1	U	2.3	U		
SILVER	1.1	390	391	0.55	U	0.6	U	0.6	U	0.57	U	0.49	U	0.39	U	0.51	U	0.44	U	0.58	U	0.53	U	0.57	U		
SODIUM	5196	NE	NE	600	U	660	U	660	U	630	U	**1240**	J	**482**	J	**1420**	J	**1360**	J	630	U	**1070**	J	630	U		
THALLIUM	1.3	0.78	0.782	1.4	U	1.6	U	1.6	U	1.5	U	1.3	U	2	U	1.3	U	2.3	U	1.5	U	1.4	U	1.5	U		
VANADIUM	42.6	390	391	**6.4**	J	**3.9**	J	**9.6**	J	**4.4**	J	**8.7**	J	**5.7**	J	**3.8**	J	**4.1**	J	**4**	J	**4.9**	J	**12.3**	J		
ZINC	54.6	23000	23500	**5**	J	**4.6**	J	**13.9**		**4.4**	J	**7.5**	J	**4**	J	2.6	U	4.4	U	2.9	U	**5.3**	J	**19.7**			

Risk Additivity
Soil Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Sample Number	OTC544-IS-0001-070612		OTC544-IS-0002-070612		OTC544-IS-0003-070612		OTC544-IS-0004-070612		OTC544-IS-0005-070612		OTC544-IS-0006-070612		OTC544-IS-0007-070612		OTC544-IS-0008-070612-FD		OTC544-IS-0009-070612		OTC544-IS-0010-070612		OTC544-IS-0011-070612	
				Sample Date	7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012	
				Location	Station 1, tank influent		Station 1, tank influent		Station 2, septic tank		Station 2, septic tank		Station 3, tank effluent		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field		Station 4, leach field	
				Depth (ft bgs)	3 - 5		10 - 12		7 - 9		14 - 16		3 - 5		10 - 12		3 - 5		3 - 5		10 - 12		0 - 2		14 - 16	
					Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PCBs (mg/kg)																										
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93		0.0083	U	0.0081	U	0.0082	U	0.008	U	0.0081	U	0.0081	U	0.0085	U	0.0086	U	0.0076	U	0.0083	U	0.008	U
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U	0.011	U	0.0095	U	0.01	U	0.01	U
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.011	U	0.011	U	0.0095	U	0.01	U	0.01	U
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22		0.0083	U	0.0081	U	0.0082	U	0.008	U	0.0081	U	0.0081	U	0.0085	U	0.0086	U	0.0076	U	0.0083	U	0.008	U
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22		0.0083	U	0.0081	U	0.0082	U	0.008	U	0.0081	U	0.0081	U	0.0085	U	0.0086	U	0.0076	U	0.0083	U	0.008	U
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12		0.0083	U	0.0081	U	0.0082	U	0.008	U	0.0081	U	0.0081	U	0.0085	U	0.0086	U	0.0076	U	0.0083	U	0.008	U
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22		0.0083	U	0.0081	U	0.0082	U	0.008	U	0.0081	U	0.0081	U	0.0085	U	0.0086	U	0.0076	U	0.0083	U	0.008	U
PETROLEUM HYDROCARBONS (mg/kg)																										
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000		5.5	U	4.4	U	2.9	U	4.9	U	5.8	U	4.5	U	6.6	U	6.2	U	4.1	U	3.7	U	4.9	U
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000		4.2	U	**5.41**	J	**7.1**	J	4.1	U	4.1	U	**8.12**	J	4.3	U	4.2	U	**5.73**	J	4.1	U	4	U
OIL RANGE ORGANICS C28-C40	NE	NE	1000		4.2	U	4	U	4.1	U	4.1	U	4.1	U	4	U	4.3	U	4.2	U	3.8	U	4.1	U	4	U
CYANIDE (mg/kg)																										
CYANIDE	NE	22.0	46.9		0.072	U	0.072	U	0.072	U	0.072	U	0.072	U	0.073	U	0.076	U	0.075	U	0.068	U	0.073	U	0.07	U
TRITIUM (pCi/g)																										
TRITIUM	NE	NE	NE		5.13	U	4.91	U	5.05	U	5.29	U	5.14	U	5.01	U	5.03	U	4.79	U	5.21	U	4.89	U	5.04	U

Risk Additivity
Soil Analytical Data
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte			Sample Number	Sample Date	Location	Depth (ft bgs)
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]			
PERCENT SOLIDS	NE	NE	NE			
VOLATILES (mg/kg)						
1,1,1-TRICHLOROETHANE	NE	8700	15600			
1,1,2,2-TETRACHLOROETHANE	NE	0.56	8.02			
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	NE	43000	72100			
1,1,2-TRICHLOROETHANE	NE	1.1	2.81			
1,1-DICHLOROETHANE	NE	3.3	64.5			
1,1-DICHLOROETHENE	NE	240	449			
1,2,4-TRICHLOROBENZENE	NE	22	73.0			
1,2-DIBROMO-3-CHLOROPROPANE	NE	0.0054	1.86			
1,2-DIBROMOETHANE	NE	0.034	0.588			
1,2-DICHLOROBENZENE	NE	1900	2310			
1,2-DICHLOROETHANE	NE	0.43	7.89			
1,2-DICHLOROPROPANE	NE	0.94	15.2			
1,3-DICHLOROBENZENE	NE	NE	NE			
1,4-DICHLOROBENZENE	NE	2.4	31.7			
2-HEXANONE	NE	210	NE			
ACETONE	NE	61000	66600			
BENZENE	NE	1.1	15.4			
BROMODICHLOROMETHANE	NE	0.27	5.41			
BROMOFORM	NE	62	616			
BROMOMETHANE	NE	7.3	16.5			
CARBON DISULFIDE	NE	820	1530			
CARBON TETRACHLORIDE	NE	0.61	10.8			
CHLOROBENZENE	NE	290	376			
CHLOROETHANE	NE	15000	29800			
CHLOROFORM	NE	0.29	5.86			
CHLOROMETHANE	NE	120	275			
CIS-1,2-DICHLOROETHYLENE	NE	160	156			
CIS-1,3-DICHLOROPROPENE	NE	NE	NE			
CYCLOHEXANE	NE	7000	NE			
DIBROMOCHLOROMETHANE	NE	0.68	12.1			
DICHLORODIFLUOROMETHANE	NE	94	168			
ETHYLBENZENE	NE	5.4	68.4			
ISOPROPYLBENZENE	NE	2100	2430			
METHYL ACETATE	NE	78000	78200			
METHYL ETHYL KETONE	NE	28000	37100			
METHYL ISOBUTYL KETONE	NE	5300	5820			
METHYLCYCLOHEXANE	NE	5630	5630			
METHYLENE CHLORIDE	NE	56	409			

Risk Additivity Evaluation at Building 1176, Holloman AFB

Analyte	C / N	0-10 ft bgs Max Hit (mg/kg)	Cancer Risk	NC ratio
1,1,1-TRICHLOROETHANE		ND		
1,1,2,2-TETRACHLOROETHANE		ND		
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE		ND		
1,1,2-TRICHLOROETHANE		ND		
1,1-DICHLOROETHANE		ND		
1,1-DICHLOROETHENE		ND		
1,2,4-TRICHLOROBENZENE		ND		
1,2-DIBROMO-3-CHLOROPROPANE		ND		
1,2-DIBROMOETHANE		ND		
1,2-DICHLOROBENZENE		ND		
1,2-DICHLOROETHANE		ND		
1,2-DICHLOROPROPANE		ND		
1,3-DICHLOROBENZENE		ND		
1,4-DICHLOROBENZENE		ND		
2-HEXANONE		ND		
ACETONE		ND		
BENZENE		ND		
BROMODICHLOROMETHANE		ND		
BROMOFORM		ND		
BROMOMETHANE		ND		
CARBON DISULFIDE		ND		
CARBON TETRACHLORIDE		ND		
CHLOROBENZENE		ND		
CHLOROETHANE		ND		
CHLOROFORM		ND		
CHLOROMETHANE		ND		
CIS-1,2-DICHLOROETHYLENE		ND		
CIS-1,3-DICHLOROPROPENE		ND		
CYCLOHEXANE		ND		
DIBROMOCHLOROMETHANE		ND		
DICHLORODIFLUOROMETHANE		ND		
ETHYLBENZENE		ND		
ISOPROPYLBENZENE		ND		
METHYL ACETATE		ND		
METHYL ETHYL KETONE		ND		
METHYL ISOBUTYL KETONE		ND		
METHYLCYCLOHEXANE		ND		
METHYLENE CHLORIDE		ND		

Risk Additivity
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Analyte			Sample Number	Risk Additivity Evaluation at Building 1176, Holloman AFB				
			Sample Date					
			Location					
			Depth (ft bgs)			0-10 ft bgs		
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
VOLATILES - continued (mg/kg)				VOLATILES - continued (mg/kg)				
STYRENE	NE	6300	7280	STYRENE		ND		
TERT-BUTYL METHYL ETHER	NE	43	901	TERT-BUTYL METHYL ETHER		ND		
TETRACHLOROETHYLENE	NE	22	7.02	TETRACHLOROETHYLENE		ND		
TOLUENE	NE	5000	5270	TOLUENE		ND		
TRANS-1,2-DICHLOROETHENE	NE	150	270	TRANS-1,2-DICHLOROETHENE		ND		
TRANS-1,3-DICHLOROPROPENE	NE	NE	NE	TRANS-1,3-DICHLOROPROPENE		ND		
TRICHLOROETHYLENE	NE	0.91	8.77	TRICHLOROETHYLENE		ND		
TRICHLOROFLUOROMETHANE	NE	790	1410	TRICHLOROFLUOROMETHANE		ND		
VINYL CHLORIDE	NE	0.06	0.728	VINYL CHLORIDE		ND		
XYLENES, TOTAL	NE	630	814	XYLENES, TOTAL		ND		
SEMIVOLATILES (mg/kg)				SEMIVOLATILES (mg/kg)				
2,2'-OXYBIS(1-CHLORO)PROPANE	NE	NE	NE	2,2'-OXYBIS(1-CHLORO)PROPANE		ND		
2,4,5-TRICHLOROPHENOL	NE	6100	6110	2,4,5-TRICHLOROPHENOL		ND		
2,4,6-TRICHLOROPHENOL	NE	44	61.1	2,4,6-TRICHLOROPHENOL		ND		
2,4-DICHLOROPHENOL	NE	180	183	2,4-DICHLOROPHENOL		ND		
2,4-DIMETHYLPHENOL	NE	1200	1220	2,4-DIMETHYLPHENOL		ND		
2,4-DINITROPHENOL	NE	120	122	2,4-DINITROPHENOL		ND		
2,4-DINITROTOLUENE	NE	1.6	15.7	2,4-DINITROTOLUENE		ND		
2,6-DINITROTOLUENE	NE	61	61.1	2,6-DINITROTOLUENE		ND		
2-CHLORONAPHTHALENE	NE	6300	6260	2-CHLORONAPHTHALENE		ND		
2-CHLOROPHENOL	NE	390	391	2-CHLOROPHENOL		ND		
2-METHYLNAPHTHALENE	NE	230	NE	2-METHYLNAPHTHALENE		ND		
2-METHYLPHENOL	NE	3100	NE	2-METHYLPHENOL		ND		
2-NITROANILINE	NE	610	NE	2-NITROANILINE		ND		
2-NITROPHENOL	NE	NE	NE	2-NITROPHENOL		ND		
3,3'-DICHLOROBENZIDINE	NE	1.1	10.8	3,3'-DICHLOROBENZIDINE		ND		
3-NITROANILINE	NE	NE	NE	3-NITROANILINE		ND		
4,6-DINITRO-2-METHYLPHENOL	NE	4.9	4.89	4,6-DINITRO-2-METHYLPHENOL		ND		
4-BROMOPHENYL PHENYL ETHER	NE	NE	NE	4-BROMOPHENYL PHENYL ETHER		ND		
4-CHLORO-3-METHYLPHENOL	NE	6100	NE	4-CHLORO-3-METHYLPHENOL		ND		
4-CHLOROANILINE	NE	2.4	NE	4-CHLOROANILINE		ND		
4-CHLOROPHENYL PHENYL ETHER	NE	NE	NE	4-CHLOROPHENYL PHENYL ETHER		ND		
4-NITROANILINE	NE	24	NE	4-NITROANILINE		ND		
4-NITROPHENOL	NE	NE	NE	4-NITROPHENOL		ND		
ACENAPHTHENE	NE	3400	3440	ACENAPHTHENE		ND		
ACENAPHTHYLENE	NE	NE	NE	ACENAPHTHYLENE		ND		
ACETOPHENONE	NE	7800	7820	ACETOPHENONE		ND		
ANTHRACENE	NE	17000	17200	ANTHRACENE		ND		
ATRAZINE	NE	2.1	NE	ATRAZINE		ND		

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Analyte			Sample Number	Risk Additivity Evaluation at Building 1176, Holloman AFB				
			Sample Date					
			Location					
			Depth (ft bgs)			0-10 ft bgs		
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
SEMIVOLATILES - continued (mg/kg)				SEMIVOLATILES - continued (mg/kg)				
BENZALDEHYDE	NE	7800	NE	BENZALDEHYDE		ND		
BENZO(A)ANTHRACENE	NE	0.15	1.48	BENZO(A)ANTHRACENE		ND		
BENZO(A)PYRENE	NE	0.015	0.148	BENZO(A)PYRENE		ND		
BENZO(B)FLUORANTHENE	NE	0.15	1.48	BENZO(B)FLUORANTHENE		ND		
BENZO(G,H,I)PERYLENE	NE	NE	NE	BENZO(G,H,I)PERYLENE		ND		
BENZO(K)FLUORANTHENE	NE	1.5	14.8	BENZO(K)FLUORANTHENE		ND		
BENZYL BUTYL PHTHALATE	NE	260	NE	BENZYL BUTYL PHTHALATE		ND		
BIPHENYL	NE	51	57.1	BIPHENYL		ND		
BIS(2-CHLOROETHOXY) METHANE	NE	180	NE	BIS(2-CHLOROETHOXY) METHANE		ND		
BIS(2-CHLOROETHYL) ETHER	NE	0.21	2.68	BIS(2-CHLOROETHYL) ETHER		ND		
BIS(2-ETHYLHEXYL) PHTHALATE	NE	35	347	BIS(2-ETHYLHEXYL) PHTHALATE	C	**0.144**	4.15E-09	
CAPROLACTAM	NE	31000	NE	CAPROLACTAM		ND		
CARBAZOLE	NE	NE	NE	CARBAZOLE		ND		
CHRYSENE	NE	15	148	CHRYSENE		ND		
DIBENZ(A,H)ANTHRACENE	NE	0.015	0.148	DIBENZ(A,H)ANTHRACENE		ND		
DIBENZOFURAN	NE	78	NE	DIBENZOFURAN		ND		
DIETHYL PHTHALATE	NE	49000	48900	DIETHYL PHTHALATE		ND		
DIMETHYL PHTHALATE	NE	611000	611000	DIMETHYL PHTHALATE		ND		
DI-N-BUTYL PHTHALATE	NE	6100	6110	DI-N-BUTYL PHTHALATE		ND		
DI-N-OCTYLPHTHALATE	NE	730	NE	DI-N-OCTYLPHTHALATE		ND		
FLUORANTHENE	NE	2300	2290	FLUORANTHENE		ND		
FLUORENE	NE	2300	2290	FLUORENE		ND		
HEXACHLOROBENZENE	NE	0.3	3.04	HEXACHLOROBENZENE		ND		
HEXACHLOROBUTADIENE	NE	6.2	61.1	HEXACHLOROBUTADIENE		ND		
HEXACHLOROCYCLOPENTADIENE	NE	370	367	HEXACHLOROCYCLOPENTADIENE		ND		
HEXACHLOROETHANE	NE	12	42.8	HEXACHLOROETHANE		ND		
INDENO(1,2,3-C,D)PYRENE	NE	0.15	1.48	INDENO(1,2,3-C,D)PYRENE		ND		
ISOPHORONE	NE	510	5120	ISOPHORONE		ND		
M,P-CRESOL	NE	NE	NE	M,P-CRESOL		ND		
NAPHTHALENE	NE	3.6	43.0	NAPHTHALENE		ND		
NITROBENZENE	NE	4.8	53.5	NITROBENZENE		ND		
N-NITROSODI-N-PROPYLAMINE	NE	0.069	NE	N-NITROSODI-N-PROPYLAMINE		ND		
N-NITROSODIPHENYLAMINE	NE	99	993	N-NITROSODIPHENYLAMINE		ND		
PENTACHLOROPHENOL	NE	0.89	8.94	PENTACHLOROPHENOL		ND		
PHENANTHRENE	NE	1830	1830	PHENANTHRENE		ND		
PHENOL	NE	18000	18300	PHENOL		ND		
PYRENE	NE	1700	1720	PYRENE		ND		

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Holloman Air Force Base, New Mexico

Analyte			Sample Number	Risk Additivity Evaluation at Building 1176, Holloman AFB				
			Sample Date					
			Location					
			Depth (ft bgs)			0-10 ft bgs		
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	Analyte	C / N	Max Hit (mg/kg)	Cancer Risk	NC ratio
EXPLOSIVES (mg/kg)				EXPLOSIVES (mg/kg)				
1,3,5-TRINITROBENZENE	NE	2200.0	NE	1,3,5-TRINITROBENZENE		ND		
1,3-DINITROBENZENE	NE	6.10	NE	1,3-DINITROBENZENE		ND		
2,4,6-TRINITROTOLUENE	NE	19.0	39.1	2,4,6-TRINITROTOLUENE		ND		
2,4-DINITROTOLUENE	NE	1.60	15.7	2,4-DINITROTOLUENE		ND		
2,6-DINITROTOLUENE	NE	61.0	61.1	2,6-DINITROTOLUENE		ND		
2-AMINO-4,6-DINITROTOLUENE	NE	150.0	NE	2-AMINO-4,6-DINITROTOLUENE		ND		
2-NITROTOLUENE	NE	2.90	29.1	2-NITROTOLUENE		ND		
3-NITROTOLUENE	NE	6.10	7.82	3-NITROTOLUENE		ND		
4-AMINO-2,6-DINITROTOLUENE	NE	150.0	NE	4-AMINO-2,6-DINITROTOLUENE		ND		
4-NITROTOLUENE	NE	30.0	244.4	4-NITROTOLUENE		ND		
HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE	NE	5.60	58.2	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE		ND		
NITROBENZENE	NE	4.80	53.5	NITROBENZENE		ND		
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	NE	3800.0	3910.7	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE		ND		
TETRYL	NE	240.0	244.0	TETRYL		ND		
METALS (mg/kg)				METALS (mg/kg)				
ALUMINUM	13722	77000	78000	ALUMINUM	N	5770		0.074
ANTIMONY	1.6	31	31.3	ANTIMONY	N	3.7		0.12
ARSENIC	3.7	0.39	3.90	ARSENIC	C	1.4	3.59E-06	
BARIUM	169.3	15000	15600	BARIUM	N	42.9		0.0028
BERYLLIUM	1.6	160	156	BERYLLIUM		ND		
CADMIUM	0.3	70	70.3	CADMIUM		ND		
CALCIUM	317332	NE	NE	CALCIUM	NUTRIENT	266000		
CHROMIUM[d]	25	117000	117000	CHROMIUMd	N	6.1		0.000052
COBALT	7.7	23	NE	COBALT	N	1.9		0.083 RSL
COPPER	13	3100	3130	COPPER	N	2.2		0.00070
IRON	23049	55000	54800	IRON	N	5530		0.10
LEAD	10.9	400	400	LEAD	N	3		0.0075
MAGNESIUM	16991	NE	NE	MAGNESIUM	NUTRIENT	5120		
MANGANESE	393	1800	1860	MANGANESE	N	72.7		0.039
MERCURY	0.0108	10	15.6	MERCURY		ND		
NICKEL	17.4	1500	1560	NICKEL	N	5		0.0032
POTASSIUM	5077	NE	NE	POTASSIUM	NUTRIENT	1760		
SELENIUM	1.4	390	391	SELENIUM		ND		
SILVER	1.1	390	391	SILVER		ND		
SODIUM	5196	NE	NE	SODIUM	NUTRIENT	1420		
THALLIUM	1.3	0.78	0.782	THALLIUM		ND		
VANADIUM	42.6	390	391	VANADIUM	N	9.6		0.025
ZINC	54.6	23000	23500	ZINC	N	13.9		0.00059

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Analyte			Sample Number	
			Sample Date	
			Location	
			Depth (ft bgs)	
	Background Values - Soil (mg/kg)[a]	EPA RSL - Residential Soil (mg/kg)[b]	NMED SSL - Residential Soil (mg/kg)[c]	
PCBs (mg/kg)				
PCB-1016 (AROCLOR 1016)	NE	3.90	3.93	
PCB-1221 (AROCLOR 1221)	NE	0.140	1.49	
PCB-1232 (AROCLOR 1232)	NE	0.140	1.49	
PCB-1242 (AROCLOR 1242)	NE	0.220	2.22	
PCB-1248 (AROCLOR 1248)	NE	0.220	2.22	
PCB-1254 (AROCLOR 1254)	NE	0.220	1.12	
PCB-1260 (AROCLOR 1260)	NE	0.220	2.22	
PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10	NE	NE	1000	
DIESEL RANGE ORGANICS C10-C28	NE	NE	1000	
OIL RANGE ORGANICS C28-C40	NE	NE	1000	
CYANIDE (mg/kg)				
CYANIDE	NE	22.0	46.9	
TRITIUM (pCi/g)				
TRITIUM	NE	NE	NE	

Risk Additivity Evaluation at Building 1176, Holloman AFB

		0-10 ft bgs		
Analyte	**C / N**	**Max Hit (mg/kg)**	**Cancer Risk**	**NC ratio**
PCBs (mg/kg)				
PCB-1016 (AROCLOR 1016)		ND		
PCB-1221 (AROCLOR 1221)		ND		
PCB-1232 (AROCLOR 1232)		ND		
PCB-1242 (AROCLOR 1242)		ND		
PCB-1248 (AROCLOR 1248)		ND		
PCB-1254 (AROCLOR 1254)		ND		
PCB-1260 (AROCLOR 1260)		ND		
PETROLEUM HYDROCARBONS (mg/kg)				
GASOLINE RANGE ORGANICS C6-C10		ND		
DIESEL RANGE ORGANICS C10-C28	N	7.1		0.0071
OIL RANGE ORGANICS C28-C40		ND		
CYANIDE (mg/kg)				
CYANIDE		ND		
TRITIUM (pCi/g)				
TRITIUM		ND		
SUM:			**3.6E-06**	**0.46**

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Value exceeds NMED SSL - Residential Soil
Value exceeds EPA RSL - Residential Soil
Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *EPA, 2012. Regional Screening Levels for Chemical Contaminants at Superfund Sites, November 2012 Update.*

[c] *NMED, 2012. Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document, Hazardous Waste Bureau and Groundwater Quality Bureau, Table A-1 Updated June 2012.*

[d] *The background concentration is Total Chromium and the screening levels are Chromium (III).*

dup = duplicate sample
ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
J = estimated value
mg/kg = milligrams per kilogram
MW = monitoring well
NE = not established
NMED = New Mexico Environment Department
PCB = polychlorinated biphenyl
pCi/g = picocuries per gram
RCRA = Resource Conservation and Recovery Act
RFI = RCRA Facility Investigation
RSL = Regional Screening Level
SSL = Soil Screening Level
U = not detected at the detection limit shown
UJ = estimated nondetect
VQ = validation qualifier

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Appendix K
Ecological Evaluation

NEW MEXICO ENVIRONMENT DEPARTMENT
SITE ASSESSMENT CHECKLIST
(From NMED (2012) Attachment A)

I. SITE LOCATION

1. Site Name: Building 1176 (OT-C544) Inactive Septic System
   US EPA I.D. Number: NM6572124422
   Location: Tularosa Basin within Holloman Air Force Base (HAFB)
   County: Otero
   City: HAFB State: NM

2. Latitude: 32º 53´ 1.156˝ N Longitude: 106º 9´ 6.242˝ W

3. Attach site maps, including a topographical map, a diagram which illustrates the layout of the facility (e.g., site boundaries, structures, etc.), and maps showing all habitat areas identified in Section III of the checklist. Also, include maps which illustrate known release areas, sampling locations, and any other important features, if available.

Note: Site maps and supporting information that include (1) a Physiographic Map, (2) a Site Layout and Sampling Location Map, and (3) a Site Photo Log are generally included for all sites in the RFI reports. A site habitat map and a Google Earth photo that shows the site habitat are attached to this Site Assessment checklist.

II. SITE CHARACTERIZATION

1. Indicate the approximate area of the site (i.e., acres or sq. ft): Approximately 1 acre

2. Provide an approximate breakdown of the land uses on the site:

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	_____% Undisturbed	100% Other[c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, etc.):
_____

[b]For agricultural areas, please list the crops and/or livestock which are present:
_____

[c]For areas designated as "other", please describe the usage of the area:
Building 1176 was constructed in 1959. The 3,850 square foot building is located at the south end of the Test Track, and is known as the Sled Launch Shop. Building 1176 contained a toilet, lavatory, and shower during the time it was connected to the septic

system. The Septic Tanks Report (HAFB, 2007 - included as Appendix A) indicates that the 640-gallon septic tank was removed prior to 2006.

3. Provide an approximate breakdown of the land uses in the area surrounding the site. Indicate the radius (in miles) of the area described: approximately 0.5 mile

_____% Heavy Industrial	_____% Light Industrial	_____% Urban
_____% Residential	_____% Rural	_____% Agricultural[b]
_____% Recreational[a]	~50 % Undisturbed	~50 % Other [c]

[a]For recreational areas, please describe the usage of the area (e.g., park, playing field, golf course, etc.):

_____

[b]For agricultural areas, please list the crops and/or livestock which are present:

_____

[c]For areas designated as "other", please describe the usage of the area:
Habitat Map for Holloman AFB (attached Figure 1) shows that habitat within 0.5 mile radius contains approximately 25 percent classified as "Development/Ground Disturbance." South of the site, another 25 percent is classified as barren alkali playa.

4. Describe reasonable and likely future land and/or water use(s) at the site.
Land use is likely to remain the same.

5. Describe the historical uses of the site. Include information on chemical releases that may have occurred as a result of previous land uses. For each chemical release, provide information on the form of the chemical released (i.e., solid, liquid, vapor) and the known or suspected causes or mechanism of the release (i.e., spills, leaks, material disposal, dumping, explosion, etc.).

_____

Building 1176 is located at the south end of the High Speed Test Track, and is known as the Sled Launch Shop. Any releases that occurred at the site result from leaks associated with the former septic system.

6. If any movement of soil has taken place at the site, describe the degree of the disturbance. Indicate the likely source of any disturbances (e.g., erosion, agricultural, mining, industrial activities, removals, etc.) and estimate when these events occurred.

_____

Site disturbances of soil have been limited to excavation activities associated with building construction and septic system installation and septic system closure activities.

7. Describe the current uses of the site. Include information on recent (previous 5 years) disturbances or chemical releases that have occurred. For each chemical release, provide information on the form of the chemical released and the causes or mechanism of the release.

Building 1176 is located at the south end of the High Speed Test Track, and is known as the Sled Launch Shop. Current site usage is the same.

8. Identify the location or suspected location of chemical releases at the site. Provide an estimate of the distance between these locations and the areas identified in Section III.

Chemical releases that may have occurred are associated with septic system leakage.

9. Identify the suspected contaminants of concern (COCs) at the site. If known, include the maximum contaminant levels. Please indicate the source of data cited (e.g., RFI, confirmatory sampling, etc.).

As documented in the RFI, detected constituents from soil samples collected include several metals, one SVOC, and petroleum hydrocarbons (only diesel range). Additionally, samples were analyzed for VOCs, explosives, PCBs, cyanide, and tritium; however all were non-detect in soil samples from the site (for 0 to 10 feet bgs, the zone of interest for ecological receptors).

10. Identify the media (e.g., soil (surface or subsurface), surface water, air, groundwater) which are known or suspected to contain COCs. _____
Surface and subsurface soil, and potentially, groundwater

11. Indicate the approximate depth to groundwater (in feet below ground surface [(bgs)].

Depth to groundwater as measured from monitoring well OTC544-MW01 is 16.8 feet from top of PVC casing.

12. Indicate the direction of groundwater flow (e.g., north, southeast, etc.)

According to Figure 2-3 of the RFI report, the direction of groundwater flow at Holloman AFB has been shown to be generally from northeast to southwest. The groundwater flow direction at Building 1176 is to the southwest.

III. HABITAT EVALUATION

III.A Wetland Habitats

Are any wetland[1] areas such as marshes or swamps on or adjacent to the site?

☐ Yes X No

If yes, indicate the wetland area on the attached site map and answer the following questions regarding the wetland area. If more than one wetland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wetland area. Distinguish between wetland areas by using names or other designations (such as location), and clearly identify each area on the site map. Also, obtain and attach a National Wetlands Inventory Map (or maps) to illustrate each wetland area.

Identify the sources of the observations and information (e.g., National Wetland Inventory, Federal or State Agency, USGS topographic maps) used to make the determination that wetland areas are or are not present.

USGS Topographic Maps

If no wetland areas are present, proceed to Section III.B.

1Wetlands are defined in 40 CFR §232.2 as " Areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Examples of typical wetlands plants include: cattails, cordgrass, willows and cypress trees. National wetland inventory maps may be available at http:\\nwi.fws.gov. Additional information on wetland delineation criteria is also available from the Army Corps of Engineers.

Wetland Area Questions

☐ Onsite ☐ Offsite

Name or
Designation:_____

1. Indicate the approximate area of the wetland (acres or ft^2)_____

2. Identify the type(s) of vegetation present in the wetland.

   - ❑ Submergent (i.e., underwater) vegetation
   - ❑ Emergent (i.e., rooted in the water, but rising above it) vegetation
   - ❑ Floating vegetation
   - ❑ Scrub/shrub
   - ❑ Wooded
   - ❑ Other (Please describe):_____

3. Estimate the vegetation density of the wetland area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Is standing water present? ☐ Yes ☐ No

   If yes, is the water primarily: ☐ Fresh or ☐ Brackish
   Indicate the approximate area of the standing water (ft^2): _____
   Indicate the approximate depth of the standing water, if known (ft. or in.)_____

5. If known, indicate the source of the water in the wetland.

   - ❑ Stream/River/Creek/Lake/Pond
   - ❑ Flooding
   - ❑ Groundwater
   - ❑ Surface runoff

6. Is there a discharge from the facility to the wetland? ☐ Yes ☐ No

   If yes, please
   describe:_____
   _____
   _____
   _____
   _____

Wetland Area Questions (Continued)

7. Is there a discharge from the wetland? ☐ Yes ☐ No
   If yes, indicate the type of aquatic feature the wetland discharges into:

   - ❑ Surface stream/River (Name:_____)
   - ❑ Lake/Pond (Name:_____)
   - ❑ Groundwater
   - ❑ Not sure

8. Does the area show evidence of flooding? ☐ Yes ☐ No
   If yes, indicate which of the following are present (mark all that apply):

   - ❑ Standing water
   - ❑ Water-saturated soils
   - ❑ Water marks
   - ❑ Buttressing
   - ❑ Debris lines
   - ❑ Mud cracks
   - ❑ Other (Please describe):_____

9. Animals observed in the wetland area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:
   _____
   _____
   _____
   _____

III.B Aquatic Habitats

III.B.1 Non-Flowing Aquatic Features

Are any non-flowing aquatic features (such as ponds or lakes) located at or adjacent to the site?

☐ Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the non-flowing aquatic features. If more than one non-flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.B.2.

Non-Flowing Aquatic Feature Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Indicate the type of aquatic feature present:

   - ❑ Natural (e.g., pond or lake)
   - ❑ Man-made (e.g., impoundment, lagoon, canal, etc.)

2. Estimate the approximate size of the water body (in acres or sq. ft.)_____

3. If known, indicate the depth of the water body (in ft. or in.)._____

Non-Flowing Aquatic Feature Questions (Continued)

4. Indicate the general composition of the bottom substrate. Mark all sources that apply from the following list.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

☐ Other (please specify):_____

5. Indicate the source(s) of the water in the aquatic feature. Mark all sources that apply from the following list.

- ❑ River/Stream/Creek
- ❑ Groundwater
- ❑ Industrial Discharge
- ❑ Surface Runoff
- ❑ Other (please specify):_____

6. Is there a discharge from the facility to the aquatic feature? ☐ Yes ☐ No
   If yes, describe the origin of each discharge and its migration path:
   _____
   _____
   _____
   _____

7. Does the aquatic feature discharge to the surrounding environment? ☐ Yes ☐ No
   If yes, indicate the features from the following list into which the aquatic feature discharges, and indicate whether the discharge occurs onsite or offsite:

- ❑ River/Stream/Creek ☐ onsite ☐ offsite
- ❑ Groundwater ☐ onsite ☐ offsite
- ❑ Wetland ☐ onsite ☐ offsite
- ❑ Impoundment ☐ onsite ☐ offsite
- ❑ Other (please describe)_____

Non-Flowing Aquatic Feature Questions (Continued)

8. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Fish
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, turtles)
- ❑ Amphibians (e.g., frogs, salamanders)
- ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

Specify species, if known:

_____
_____
_____
_____

III.B.2 Flowing Aquatic Features

Are any flowing aquatic features (such as streams or rivers) located at or adjacent to the site?

☐ Yes X No

If yes, indicate the aquatic feature on the attached site map and answer the following questions regarding the flowing aquatic features. If more than one flowing aquatic feature is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual aquatic feature. Distinguish between aquatic features by using names or other designations, and clearly identify each area on the site map

If no, proceed to Section III.C.

Flowing Aquatic Feature Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Indicate the type of flowing aquatic feature present.

   - ❑ River
   - ❑ Stream
   - ❑ Creek
   - ❑ Brook
   - ❑ Dry wash
   - ❑ Arroyo
   - ❑ Intermittent stream
   - ❑ Artificially created (ditch, etc.)
   - ❑ Other (specify)
   - ❑

2. Indicate the general composition of the bottom substrate.

☐ Bedrock	☐ Sand	☐ Concrete
☐ Boulder (>10 in.)	☐ Silt	☐ Debris
☐ Cobble (2.5 - 10 in.)	☐ Clay	☐ Detritus
☐ Gravel (0.1 - 2.5 in.)	☐ Muck (fine/black)	

   ☐ Other (please specify):_____

3. Describe the condition of the bank (e.g., height, slope, extent of vegetative cover) of the aquatic feature.

   _____
   _____
   _____
   _____

4. Is there a discharge from the facility to the aquatic feature? ☐ Yes ☐ No
   If yes, describe the origin of each discharge and its migration path:

   _____
   _____
   _____
   _____

5. Indicate the discharge point of the water body. Specify name, if known.

   _____
   _____
   _____

Flowing Aquatic Feature Questions (Continued)

6. If the flowing aquatic feature is a dry wash or arroyo, answer the following questions.
   - ❑ Check here if feature is not a dry wash or arroyo

   If known, specify the average number of days in a year in which flowing water is present in the feature: _____

   Is standing water or mud present? Check all that apply.
   - ❑ Standing water
   - ❑ Mud
   - ❑ Neither standing water or mud

   Does the area show evidence of recent flow (e.g., flood debris clinging to vegetation)?
   - ❑ Yes
   - ❑ No
   - ❑ Not sure
7. Animals observed in the vicinity of the aquatic feature or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Fish
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, turtles)
   - ❑ Amphibians (e.g., frogs, salamanders)
   - ❑ Sediment-dwelling invertebrates (e.g., mussels, crayfish, insect nymphs)

   Specify species, if known:

   _____
   _____
   _____
   _____

III.C Terrestrial Habitats

III.C.1 Wooded

Are any wooded areas on or adjacent to the site? ☐ Yes X No

If yes, indicate the wooded area on the attached site map and answer the following questions. If more than one wooded area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual wooded area. Distinguish between wooded areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.2.

Wooded Area Questions

☐ On-site ☐ Off-site

Name or Designation:_____

1. Estimate the approximate size of the wooded area (in acres or sq. ft.)

2. Indicate the dominant type of vegetation in the wooded area.

   - ❑ Evergreen
   - ❑ Deciduous
   - ❑ Mixed

Dominant plant species, if known:_____

3. Estimate the vegetation density of the wooded area.

   - ❑ Dense (i.e., greater than 75% vegetation)
   - ❑ Moderate (i.e., 25% to 75% vegetation)
   - ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the predominant size of the trees at the site. Use diameter at chest height.

   - ❑ 0-6 inches
   - ❑ 6-12 inches
   - ❑ >12 inches
   - ❑ No single size range is predominant

5. Animals observed in the wooded area or suspected to be present based on indirect evidence or file material:

   - ❑ Birds
   - ❑ Mammals
   - ❑ Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:_____

III.C.2 Shrub/Scrub

Are any shrub/scrub areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the shrub/scrub area on the attached site map and answer the following questions. If more than one shrub/scrub area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual shrub/scrub area. Distinguish between shrub/scrub areas, using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.3.

Shrub/Scrub Area Questions

X Onsite X Offsite

Name or Designation: Chihuahuan Desert Scrub (HAFB, 2011).
Note also: On-site areas are almost entirely gravel covered and void of habitat or vegetation with some apparent pockets of desert vegetation. Surrounding site habitat is characterized as Chihuahuan Desert. The habitat map (Figure 1) shows that habitat surrounding the site(generally to the north) is dominated by fourwing saltbush/gypsum dropseed shrubland habitat, with lesser amounts of fourwing saltbush/alkali sacaton shrubland and alkali sacaton grassland. To the south, there are areas of pickleweed shrubland and gypsum dropseed grassland habitats, then large expanses of barren alkali playa.

1. Estimate the approximate size of the shrub/scrub area (in acres or sq. ft.). Surrounding HAFB are tens of thousands of acres of Chihuahuan Desert Scrub.

2. Indicate the dominant type of shrub/scrub vegetation present, if known.

According to information provided in Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011), the area around Building 1176 (OT-C544) is dominated by Fourwing Saltbush/Alkali Sacaton Shrubland to the north with large areas of barren alkali playa to the south.

3. Estimate the vegetation density of the shrub/scrub area.

- ❑ Dense (i.e., greater than 75% vegetation)
- X Moderate (i.e., 25% to 75% vegetation)
- ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the scrub/shrub vegetation.

- ❑ 0-2 feet
- X 2-5 feet
- ❑ >5 feet

5. Animals observed in the shrub/scrub area or suspected to be present based on indirect evidence or file material:
   - X Birds
   - X Mammals
   - X Reptiles (e.g., snakes, lizards)
   - ❑ Amphibians (e.g., toads, salamanders)

   Specify species, if known:
   The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna

associated with the shrubland habitat potentially present in the area of Building 1176. Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam kangaroo rat *(Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.3 Grassland

Are any grassland areas on or adjacent to the site? ☐ Yes X No

If yes, indicate the grassland area on the attached site map and answer the following questions. If more than one grassland area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual grassland area. Distinguish between grassland areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.4.

Grassland Area Questions

☐ Onsite ☐ Offsite

Name or Designation:_____

1. Estimate the approximate size of the grassland area (in acres or sq. ft.)._____

2. Indicate the dominant plant type, if known.
_____
_____
_____
_____

3. Estimate the vegetation density of the grassland area.

- ❑ Dense (i.e., greater than 75% vegetation)
- ❑ Moderate (i.e., 25% to 75% vegetation)
- ❑ Sparse (i.e., less than 25% vegetation)

4. Indicate the approximate average height of the dominant plant type (in ft. or in.)_

5. Animals observed in the grassland area or suspected to be present based on indirect evidence or file material:

- ❑ Birds
- ❑ Mammals
- ❑ Reptiles (e.g., snakes, lizards)
- ❑ Amphibians (e.g., toads, salamanders)

Specify species, if known:

III.C.4 Desert

Are any desert areas on or adjacent to the site? X Yes ☐ No

If yes, indicate the desert area on the attached site map and answer the following questions. If more than one desert area is present on or adjacent to the site, make additional copies of the following questions and fill out for each individual desert area. Distinguish between desert areas by using names or other designations, and clearly identify each area on the site map.

If no, proceed to Section III.C.5.

Desert Area Questions

X Onsite X Offsite
Name or Designation: Chihuahuan Desert

1. Estimate the approximate size of the desert area (in acres or sq. ft.).
This site including HAFB is contained within tens of thousands of acres of the Chihuahuan Desert.

2. Describe the desert area (e.g., presence or absence of vegetation, vegetation types, presence/size of rocks, sand, etc.)
Many volumes of literature have been written on the natural biota of the Chihuahuan Desert. Detailed descriptions about the biotic communities within HAFB can be found in the HAFB Integrated Natural Resource Management Plan, (HAFB, 2011). Habitats directly associated with this Site include typical desert scrub communities.

3. Animals observed in the desert area or suspected to be present based on indirect evidence or file material:

X Birds
X Mammals
X Reptiles (e.g., snakes, lizards)
☐ Amphibians (e.g., toads, salamanders)

Specify species, if known:

The Integrated Natural Resources Management Plan for Holloman Air Force Base (HAFB, 2011) provides information on the fauna that are present at the site. Considering its relatively small size, Holloman AFB provides a relatively large diversity of habitats for aquatic and terrestrial species. This discussion will focus on fauna associated with the shrubland habitat potentially present in the area of Building 1176. Surveys conducted at HAFB have identified fourteen species of rodents. Those that could commonly occur in the shrubland habitat of the site include the White Sands wood rat(*Neotoma micropus leucophaea)*, the house mouse(*Mus musculus), the* Merriam

kangaroo rat (*Dipodomys merriami)* and the silky pocket mouse (*Perognathus flavus*), as well as other rodent species. Other wildlife species common to the area include coyote (*Canis latrans*), desert cottontail (*Sylvilagus audubonii*), and blacktail jackrabbit (*Lepus californicus*). Though rarely sighted, long-tailed weasel (*Mustela frenata*) are known to occur on HAFB. Evidence of mountain lions (*Felis concolor*) in the general area of the site exists as mountain lion scat was found within Holloman AFB in 1994, near the confluence of Malone and Ritas Draws. Other species potentially present include the desert mule deer (*Odocoileus hemionus crooki*), and the raccoon (*Procyon lotor*).

At least 230 bird species have been confirmed at Holloman AFB. Those common in the grassland and shrubland habitats include nine species of sparrows and other typical grassland species such as Swainson's hawk (*Buteo swainsoni*), prairie falcon (*Falco mexicanus*), eastern and western meadowlark (*Sturnella magna* and *S. neglecta*), scaled quail (*Callipepla aquamata*), four species of wren, and three thrasher species. There have been two verified sightings of wild turkey (*Meleagris* sp.), one in 1997 near Hay Draw and the most recent in November 1999 in Lost River.

III.C.5 Other

1. Are there any other terrestrial communities or habitats on or adjacent to the site which were not previously described?

☐ Yes X No

If yes, indicate the "other" area(s) on the attached site map and describe the area(s) below. Distinguish between onsite and offsite areas. If no, proceed to Section III.D.

III.D Sensitive Environments and Receptors

1. Do any other potentially sensitive environmental areas[2] exist adjacent to or within 0.5 miles of the site? If yes, list these areas and provide the source(s) of information used to identify sensitive areas. *Do not answer "no" without confirmation from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

The following is taken from the Integrated Natural Resources Management Plan for HAFB (HAFB,2011). HAFB and its Geographically Separated Units (GSUs) have high biodiversity, including many sensitive species. No threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The White Sands pupfish is not Federally-listed nor has critical habitat been designated because of the multi-agency cooperative agreement to manage the species to support viable populations through habitat management and research. This site lies within a 0.5 mile radius of potential habitat for the White Sands Pupfish.

Most of the sensitive species are birds that are either associated with grassland habitats on main base or with wetland habitats, primarily in the Lake Holloman Public Access Area

2 Areas that provide unique and often protected habitat for wildlife species. These areas are typically used during critical life stages such as breeding, hatching, rearing of young and overwintering. Refer to **Table 1** at the end of this document for examples of sensitive environments.

wetlands complex south of the Cantonment. Sensitive grassland and desert species at HAFB that are discussed in further detail in the management plan include:

- White Sands pupfish
- Acarospora clauzadeana lichen
- Grassland neotropical migratory birds
- Western burrowing owl
- Aplomado falcon
- Grassland raptors
- Bats
- Texas horned lizard and other reptiles

2. Are any areas on or near (i.e., within 0.5 miles) the site which are owned or used by local tribes? If yes, describe. *Contact the Tribal Liason in the Office of the Secretary (505)827-2855 to obtain this information.*

No

3. Does the site serve or potentially serve as a habitat, foraging area, or refuge by rare, threatened, endangered, candidate and/or proposed species (plants or animals), or any otherwise protected species? If yes, identify species. *This information should be obtained from the U.S. Fish and Wildlife Service and appropriate State of New Mexico division.*

No, based on information in the Integrated Natural Resources Management Plan, no threatened or endangered species listed under the Endangered Species Act are presently known to occur on base. The plan establishes protocols for management of sensitive desert and grassland habitats.

4. Is the site potentially used as a breeding, roosting or feeding area by migratory bird species? If yes, identify which species.

Likely not. The site has very limited viable habitat due to the disturbed nature of the site, but areas surrounding the site could potentially provide habitat for these purposes.

5. Is the site used by any ecologically[3], recreationally, or commercially important

3 Ecologically important species include populations of species which provide a critical (i.e., not replaceable) food resource for higher organisms and whose function as such would not be replaced by more tolerant species; or perform a critical ecological function (such as organic matter decomposition) and whose functions will not be replaced by other species. Ecologically important species include pest and opportunistic species that populate an area if they serve as a food source for other species, but do not include domesticated animals (e.g., pets and livestock) or plants/animals whose existence is maintained by continuous human interventions (e.g., fish hatcheries, agricultural crops, etc.,)

species? If yes, explain.

No

IV. EXPOSURE PATHWAY EVALUATION

1. Do existing data provide sufficient information on the nature, rate, and extent of contamination at the site?

   X Yes
   ❑ No
   ❑ Uncertain

   Please provide an explanation for your answer: Sample results have sufficiently characterized the site.

2. Do existing data provide sufficient information on the nature, rate, and extent of contamination in offsite affected areas?

   □ Yes
   ❑ No
   ❑ Uncertain
   X No offsite contamination

   Please provide an explanation for your answer:
   No offsite contamination is expected, and no off-site soil or groundwater samples were collected.

3. Do existing data address potential migration pathways of contaminants at the site?

X Yes
❑ No
❑ Uncertain

Please provide an explanation for your answer

While potential migration from impacted soils to groundwater might occur, no ecological exposure to groundwater is expected.

4. Do existing data address potential migration pathways of contaminants in offsite affected areas?

□ Yes
❑ No
❑ Uncertain
X No offsite contamination

Please provide an explanation for your answer:

See response to No. 3 presented previously. Also, no off-site soil contamination is expected.

5. Are there visible indications of stressed habitats or receptors on or near (i.e., within 0.5 miles) the site that may be the result of a chemical release? If yes, explain. Attach photographs if available.

No.

6. Is the location of the contamination such that receptors might be reasonably expected to come into contact with it? For soil, this means contamination in the soil 0 to 5 feet below ground surface (bgs). If yes, explain.

Yes. Some soil samples were collected in site areas where receptors might contact detected constituents.

7. Are receptors located in or using habitats where chemicals exist in air, soil, sediment or surface water? If yes, explain.

Yes. See response to No. 6 presented above.

8. Could chemicals reach receptors via groundwater? Can chemicals leach or dissolve to groundwater? Are chemicals mobile in groundwater? Does groundwater discharge into receptor habitats? If yes, explain.

No Groundwater does not discharge into receptor habitats at or near the site.

9. Could chemicals reach receptors through runoff or erosion? Answer the following questions:

What is the approximate distance from the contaminated area to the nearest watercourse or arroyo?

- ❑ 0 feet (i.e., contamination has reached a watercourse or arroyo)
- ❑ 1-10 feet
- ❑ 11-20 feet
- ❑ 21-50 feet
- ❑ 51-100 feet
- ❑ 101-200 feet
- ❑ > 200 feet
- ❑ > 500 feet
- X > 1000 feet

What is the slope of the ground in the contaminated area?

- X 0-10%
- ❑ 10-30%
- ❑ > 30%

What is the approximate amount of ground and canopy vegetative cover in the contaminated area?

- ❑ < 25%
- X 25-75%
- ❑ > 75%

Is there visible evidence of erosion (e.g., a rill or gully) in or near the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

Do any structures, pavement, or natural drainage features direct run-on flow (i.e., surface flows originating upstream or uphill from the area of concern) into the contaminated area?

- ❑ Yes
- X No
- ❑ Do not know

10. Could chemicals reach receptors through the dispersion of contaminants in air (e.g., volatilization, vapors, fugitive dust)? If yes, explain.

Yes. However, detected concentrations of constituents in soil do not generally exceeding relevant background values or ecological screening criteria (see screening assessment in main text).

11. Could chemicals reach receptors through migration of non-aqueous phase liquids (NAPLs)? Is a NAPL present at the site that might be migrating towards receptors or habitats? Could NAPL discharge contact receptors or their habitat?

No NAPLs are present at the site.

12. Could receptors be impacted by external irradiation at the site? Are gamma emitting radionuclides present at the site? Is the radionuclide contamination buried or at the surface?

No. No radionuclide contamination is expected to be present at the site.

PHOTOGRAPHIC DOCUMENTATION

During the site visit(s), photographs should be taken to document the current conditions at the site and to support the information entered in the checklist. For example, photographs may be used to document the following:

- The nature, quality, and distribution of vegetation at the site
- Receptors or evidence of receptors
- Potentially important ecological features, such as ponds and drainage ditches
- Potential exposure pathways
- Any evidence of contamination or impact

SUMMARY OF OBSERVATIONS AND SITE SETTING

Include information on significant source areas and migration pathways that are likely to constitute complete exposure pathways.

Although potentially complete exposure pathways exist (e.g. direct contact with surface soil), significant source areas are not present, as results of the screening assessment (see main text) indicate that detected concentrations of constituents in soil do not generally exceeding relevant ecological screening criteria.

Checklist Completed by Caitlin LaChance

Affiliation CB&I Federal Services, LLC.

Author Assisted by William Stanhope, CB&I Federal Services, LLC.

Date_July 23, 2013

REFERENCES

Holloman Air Force Base (HAFB), 2011. *Integrated Natural Resource Management Plan*, February.

Holloman Air Force Base (HAFB), 2007. *Holloman Air Force Base Septic Tanks*, April.

New Mexico Environment Department (NMED), 2012. *Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Tier 1: Soil Screening Guidance Technical Background Document*, Hazardous Waste Bureau and Ground Water Quality Bureau, February, Table A-1 updated June 2012.

Building 1176 Location

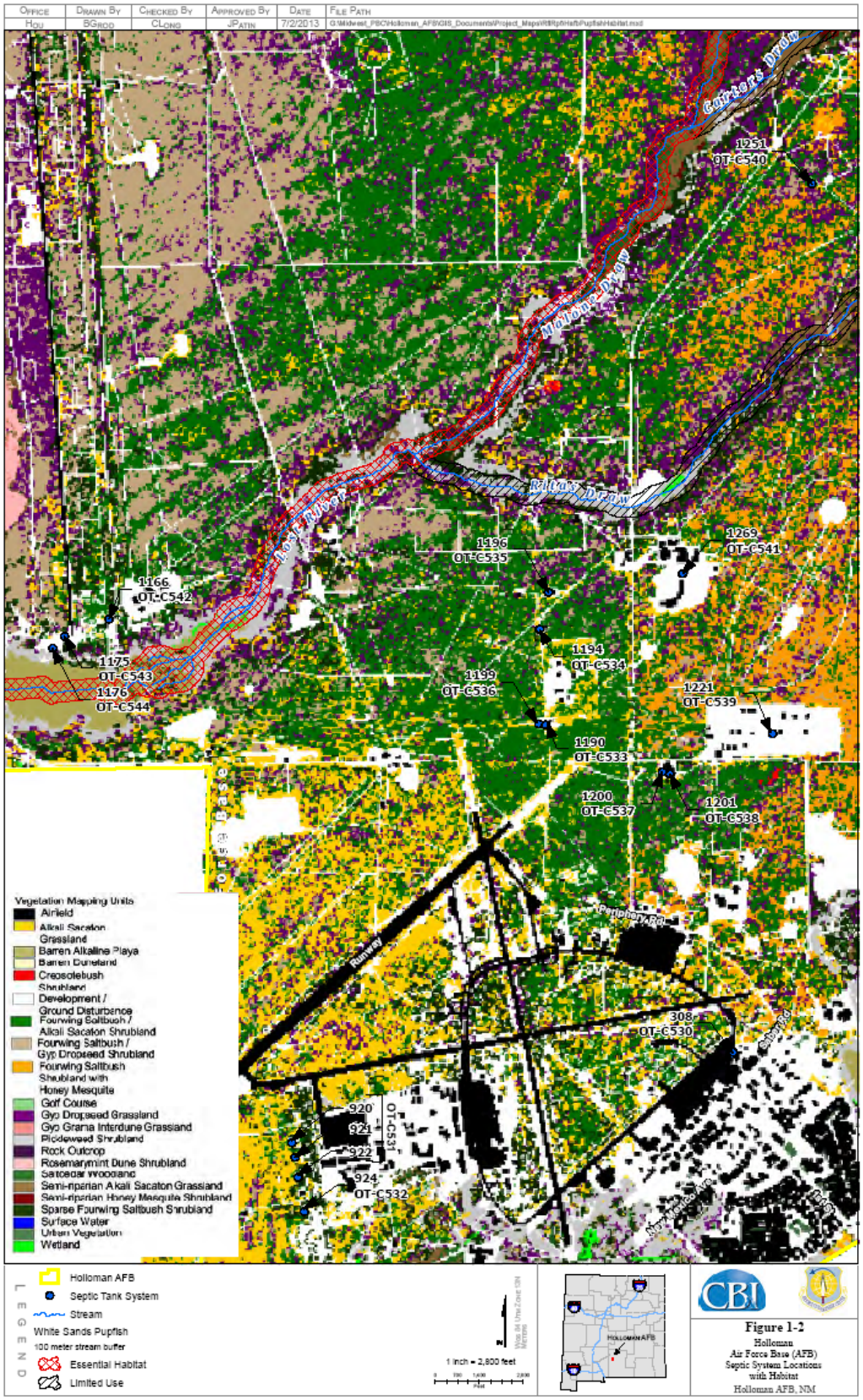

Figure 1-2
Holloman
Air Force Base (AFB)
Septic System Locations
with Habitat
Holloman AFB, NM

TABLE 1
EXAMPLES OF SENSITIVE ENVIRONMENTS

National Parks and National Monuments

Designated or Administratively Proposed Federal Wilderness Areas

National Preserves

National or State Wildlife Refuges

National Lakeshore Recreational Areas

Federal land designated for protection of natural ecosystems

State land designated for wildlife or game management

State designated Natural Areas

Federal or state designated Scenic or Wild River

All areas that provide or could potentially provide critical habitat[1] for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern

All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes

All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)

All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)

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1 Critical habitats are defined by the Endangered Species Act (50 CFR §424.02(d)) as:

> 1) Specific areas within the geographical area currently occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (ii) that may require special management considerations or protection, and 2) Specific areas outside the geographical area occupied by a species at the time it is listed upon a determination by the Secretary [of Interior] that such areas are essential for the conservation of the species.

All areas that provide or could potentially provide habitat for song birds as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-13)

All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)

All areas that provide or could potentially provide habitat for horned toads and Bullfrogs as protected by the State of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, resp.)

All perennial waters (e.g., rivers, lakes, playas, sloughs, ponds, etc)

All ephemeral drainage (e.g., arroyos, puddles/pools, intermittent streams, etc) that provide significant wildlife habitat or that could potentially transport contaminants off site to areas that provide wildlife habitat

All riparian habitats

All perennial and ephemeral wetlands (not limited to jurisdictional wetlands)

All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle.

ATTACHMENT B

ECOLOGICAL SITE EXCLUSION CRITERIA CHECKLIST AND DECISION TREE

1. NEW MEXICO ECOLOGICAL EXCLUSION CRITERIA CHECKLIST

The following questions are designed to be used in conjunction with the Ecological Exclusion Criteria Decision Tree (Figure 1). After answering each question, refer to the Decision Tree to determine the appropriate next step. In some cases, questions will be omitted as the user is directed to another section as indicated by the flow diagram in the Decision Tree. For example, if the user answers "yes" to Question 1 of Section I, he or she is directed to proceed to Section II.

I. Habitat

In the following questions, "affected property" refers to all property on which a release has occurred or is believed to have occurred, including off-site areas where contamination may have occurred or migrated.

1. Are any of the below-listed sensitive environments at, adjacent to, or in the locality1 of the affected property?

   - National Park or National Monument
   - Designated or administratively proposed Federal Wilderness Area
   - National Preserve
   - National or State Wildlife Refuge
   - Federal or State land designated for wildlife or game management
   - State designated Natural Areas
   - All areas that are owned or used by local tribes
   - All areas that are potentially important breeding, staging, and overwintering habitats as well as other habitats important for the survival of animals during critical periods of their life cycle
   - All areas that provide or could potentially provide habitat for state and federally listed Threatened or Endangered Species, those species that are currently petitioned for listing, and species designated by other agencies as sensitive or species of concern
   - All areas that provide or could potentially provide habitat for state protected species as defined in the Wildlife Code, Chapter 17 of the New Mexico Statutes
   - All areas that provide or could potentially provide habitat for migratory birds as protected by the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712)
   - All areas that provide or could potentially provide habitat for bald eagles and golden eagles as protected by the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d)
   - All areas that provide or could potentially provide habitat for song birds as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game

1 *Locality* of the site refers to any area where an ecological receptor is likely to contact site-related chemicals. The locality of the site considers the likelihood of contamination migrating over time and places the site in the context of its general surrounding. Therefore, the locality is typically larger than the site and the areas adjacent to the site.

and Fish, 17-2-13)

- All areas that provide or could potentially provide habitat for hawks, vultures and owls as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-14)
- All areas that provide or could potentially provide habitat for horned toads and bullfrogs as protected by the state of New Mexico statute (New Mexico Statute, 1978, Chapter 17, Game and Fish, 17-2-15 and 16, respectively)

2. Does the affected property contain land areas which were not listed in Question 1, but could be considered viable ecological habitat? The following are examples (but not a complete listing) of viable ecological habitats:

- Wooded areas
- Shrub/scrub vegetated areas
- Open fields (prairie)
- Other grassy areas
- Desert areas
- Any other areas which support wildlife and/or vegetation, excluding areas which support only opportunistic species (such as house mice, Norway rats, pigeons, etc.) that do not serve as prey to species in adjacent habitats.

The following features are <u>not</u> considered ecologically viable:

- Pavement
- Buildings
- Paved areas of roadways
- Paved/concrete equipment storage pads
- Paved manufacturing or process areas
- Other non-natural surface cover or structure

3. Does the affected property contain any perennial or ephemeral aquatic features which were not listed in Question 1?

II. Receptors

1. Is any part of the affected property used for habitat, foraging area, or refuge by any rare, threatened, or endangered species (plant *or* animal), or otherwise protected species (e.g., raptors, migratory birds)?

2. Is any part of the affected property used for habitat, foraging area, or refuge by any species used as a recreational (e.g., game animals) and/or commercial resource?

3. Is any part of the affected property used for habitat, foraging area, or refuge by any plant or animal species? This includes plants considered "weeds" and opportunistic insect and animal species (such as cockroaches and rats) if they are used as a food source for other species in the area.

III. Exposure Pathways

1. Could receptors be impacted by contaminants via direct contact?

   Is a receptor located in or using an area where it could contact contaminated air, soil[3], or surface water?

For Questions 2 and 3, note that one must answer "yes" to all three bullets in order to be directed to the "exclusion denied" box of the decision tree. This is because answering "no" to one of the questions in the bullet list indicates that a complete exposure pathway is not present. For example, in Question 2, if the chemical cannot leach or dissolve to groundwater (bullet 1), there is no chance of ecological receptors being exposed to the chemical through contact with contaminated groundwater. Similarly, the responses to the questions in Question 4 determine whether a complete pathway exists for exposure to NAPL.

2. Could receptors contact contaminants via groundwater?
   - Can the chemical leach or dissolve to groundwater[4]?
   - Can groundwater mobilize the chemical?
   - Could (does) contaminated groundwater discharge into known or potential receptor habitats?

3. Could receptors contact contaminants via runoff (i.e., surface water and/or suspended sediment) or erosion by water or wind?
   - Are chemicals present in surface soils?
   - Can the chemical be leached from or eroded with surface soils?
   - Is there a receptor habitat located downgradient of the leached/eroded surface soil?

---

3 For soil, this means contamination less than 5 feet below ground surface (bgs).

4 Information on the environmental fate of specific chemicals can be found on the Internet at *http://www.epa.gov/opptintr/chemfact/* or at a local library in published copies of the *Hazardous Substances Data Bank*.

4. Could receptors contact contaminants via migration of non-aqueous phase liquids (NAPL)?

- Is NAPL present at the site?
- Is NAPL migrating toward potential receptors or habitats?
- Could NAPL discharge impact receptors or habitats?

Figure 1 -Ecological Exclusion Criteria Decision Tree

(Refer to corresponding checklist for the full text of each question)

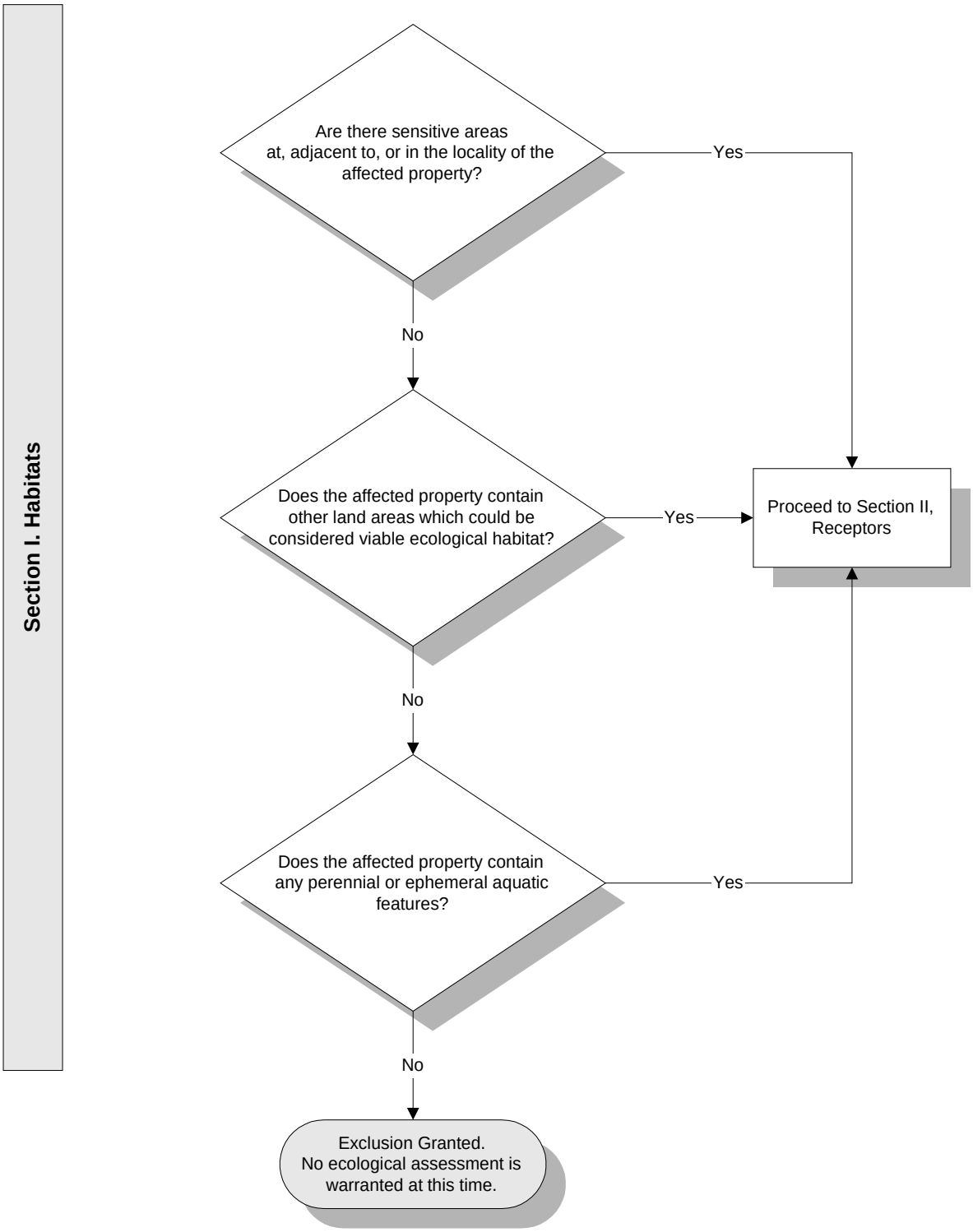


Figure 1 - Exclusion Criteria Decision Tree (continued)

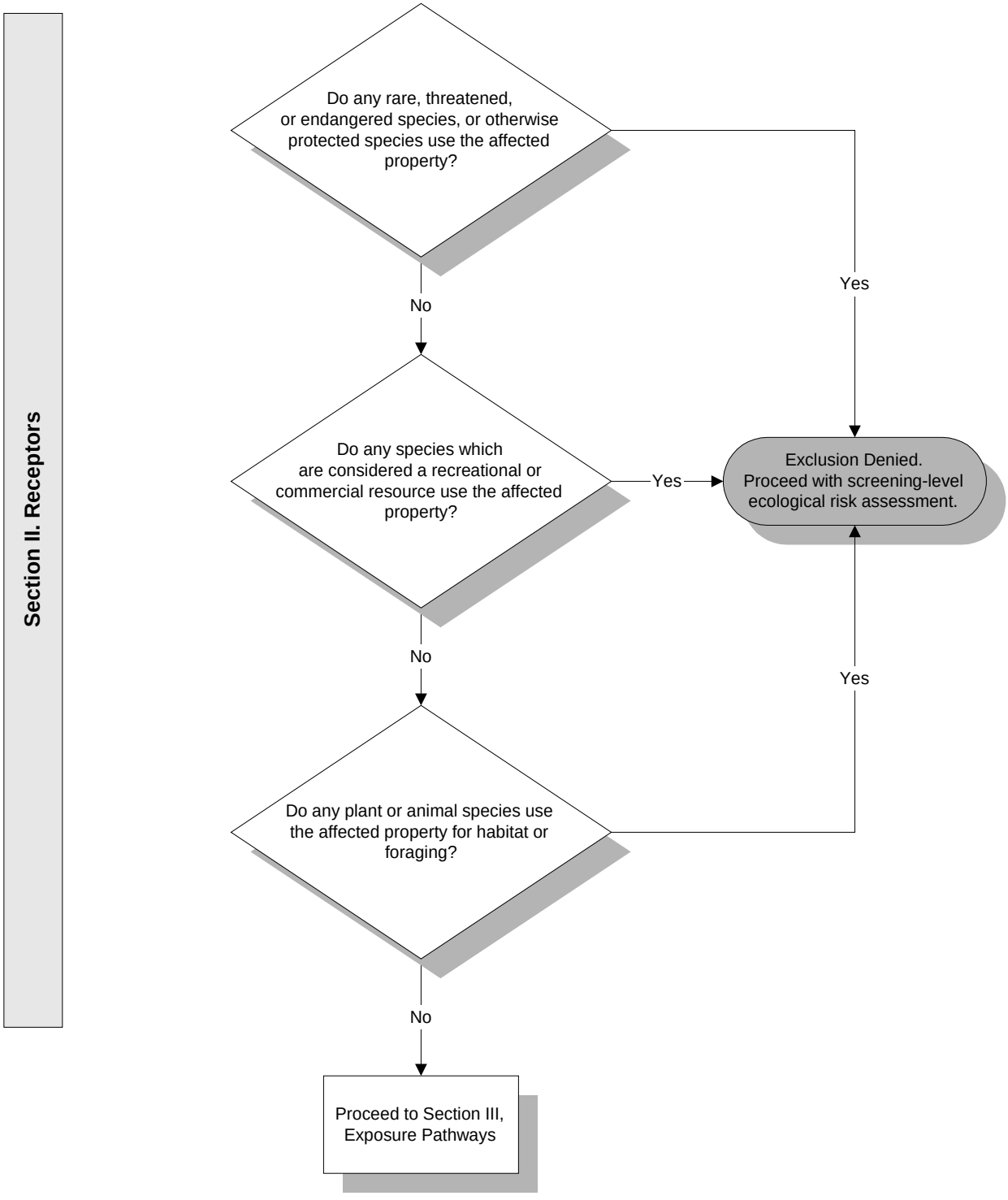
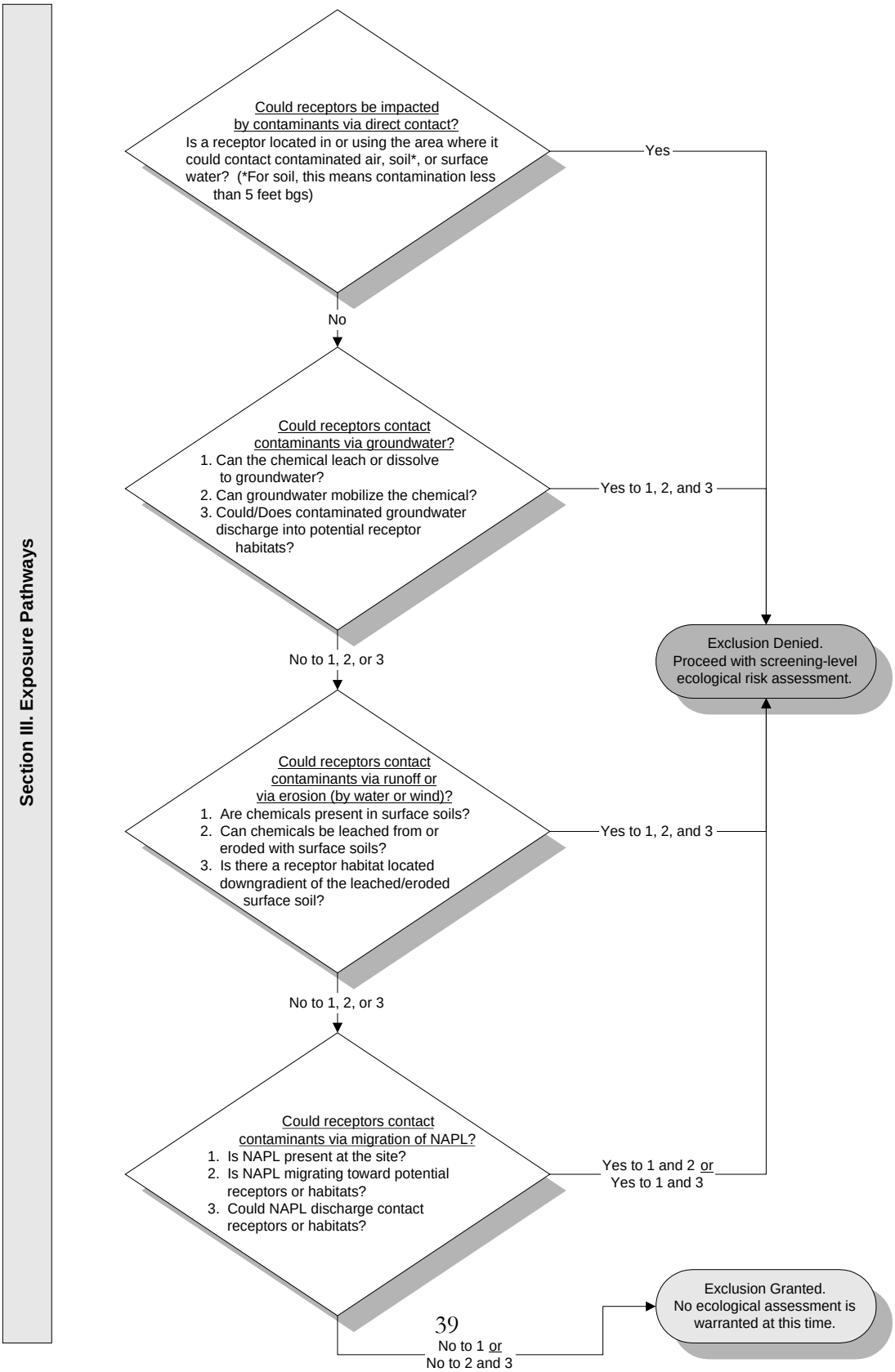


Figure 1 - Exclusion Criteria Decision Tree (continued)



bis(2-Ethylhexyl) phthalate (mg/kg)	d_bis(2-Ethylhexyl) phthalate (mg/kg)	Antimony (mg/kg)	d_Antimony (mg/kg)
0.144	1	1.1	0
0.081	0	1.2	0
0.081	0	0.99	0
0.085	0	1	0
0.084	0	3.7	1
0.083	0	1.1	0

1				**General UCL Statistics for Data Sets with Non-Detects**								
2			**User Selected Options**									
3			From File	input.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
7												
8												
9	**bis(2-Ethylhexyl) phthalate (mg/kg)**											
10												
11						**General Statistics**						
12						Number of Valid Data	6			Number of Detected Data	1	
13						Number of Distinct Detected Data	1			Number of Non-Detect Data	5	
14										Percent Non-Detects	83.33%	
15												
16	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
17	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
18												
19	**The data set for variable bis(2-Ethylhexyl) phthalate (mg/kg) was not processed!**											
20												
21												
22												
23	**Antimony (mg/kg)**											
24												
25						**General Statistics**						
26						Number of Valid Data	6			Number of Detected Data	1	
27						Number of Distinct Detected Data	1			Number of Non-Detect Data	5	
28										Percent Non-Detects	83.33%	
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30	**Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!**											
31	**It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).**											
32												
33	**The data set for variable Antimony (mg/kg) was not processed!**											
34												
35												

CAS	Total	Detects	FOD	Mindet	Maximum concentration of defects	minnd	maxnd	arithmean	arithsd	cvnorm	geomean	geostd	estmnln	eststdln	sw95	swnorm	swln	sf95	sfnorm	sfln	distributio
Antimony	6	1	16.67%		3.7	0.99	1.2	1.065833	1.291048	1.211304	0.741496	2.204853	1.013578	0.944597	0.788	0.524	0.579				U
bis(2-Ethylhexyl) phthalate	6	1	16.67%		0.144	0.081	0.085	0.0585	0.041894	0.716135	0.050952	1.664188	0.058009	0.03157	0.788	0.514	0.532				U

Median	95uclnorm	sdln	h	95uclln	95uclnp	95quantno	95quantln	95quantnp	utl95norm	utl95ln	quant95np	Units	cohenmnn	cohenstdn	cohenmnlr	cohenstdln	aitchmnno	aithcstdno	aitchmnln	aitchstdln	poisspl	Pathway	BootStrap	AMQ at	0.95%
1.1	2.127901	0.790661	3.448609	3.431151	3.7	3.189607	2.722504	3.7	5.856911	13.94411	3.7	mg/kg										4	1.63195		
0.0835	0.092964	0.509338	2.661717	0.106366	0.144	0.127415	0.117771	0.144	0.213968	0.33732	0.144	mg/kg										4	0.080479		

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte		Sample Number	OTC544-IS-0001-070612		OTC544-IS-0003-070612		OTC544-IS-0005-070612		OTC544-IS-0007-070612		OTC544-IS-0008-070612-FD		OTC544-IS-0010-070612	
		Sample Date	7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012	
		Location	Station 1, tank influent		Station 2, septic tank		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field	
		Depth (ft bgs)	3 - 5		7 - 9		3 - 5		3 - 5		3 - 5		0 - 2	
	Background Values - Soil (mg/kg)[a]	LANL (2012) ESLs (mg/kg)[b]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	**79.9**		**81.9**		**82.2**		**77.5**		**78.7**		**80.2**	
SEMIVOLATILES (mg/kg)														
BIS(2-ETHYLHEXYL) PHTHALATE	NE	0.02 / 0.2	0.144	J	0.081	U	0.081	U	0.085	U	0.084	U	0.083	U
METALS (mg/kg)														
ALUMINUM	13722	pH Dependent	**2460**		**5770**		**3700**		**1290**		**1500**		**2310**	
ANTIMONY	1.6	0.05 / 0.5	1.1	U	1.2	U	0.99	U	1	U	3.7	J	1.1	U
BARIUM	169.3	110 / 260	**32.2**	J	**41.8**	J	**42.9**	J	**25.6**	J	**27.8**	J	**29.2**	J
CALCIUM	317332	NSV	**214000**		**218000**		**231000**		**263000**		**266000**		**251000**	
CHROMIUM	25	28 / 280	**2.4**	J	**6.1**		**3.5**	J	**0.99**	J	0.89	U	**1.7**	J
COBALT	7.7	13 / 130	**0.83**	J	**1.9**	J	**1.2**	J	0.51	U	**0.55**	J	**0.87**	J
COPPER	13	15 / 46	**2**	J	**2.2**	J	**1.8**	J	**1.7**	J	**1.8**	J	**2.2**	J
IRON	23049	NSV	**2160**		**5530**		**3490**		**1050**		**1240**		**1870**	
LEAD	10.9	14 / 28	**1.1**	J	**3**	J	**1.8**	J	0.51	U	0.89	U	**0.64**	J
MAGNESIUM	16991	NSV	**5120**		**3380**		**4520**		**4110**		**4260**		**4330**	
MANGANESE	393	220 / 1,100	**47.1**		**72.7**		**66.5**		**20.4**		**23.3**		**40.5**	
NICKEL	17.4	9.7 / 19	**1.7**	J	**5**	J	**2.6**	J	**1.2**	J	**1.3**	J	**1.7**	J
POTASSIUM	5077	NSV	**610**	J	**1760**	J	**930**	J	**432**	J	**468**	J	**614**	J
SODIUM	5196	NSV	600	U	660	U	**1240**	J	**1420**	J	**1360**	J	**1070**	J
VANADIUM	42.6	0.025 / 0.25	6.4	J	9.6	J	8.7	J	3.8	J	4.1	J	4.9	J
ZINC	54.6	48 / 480	**5**	J	**13.9**		**7.5**	J	2.6	U	4.4	U	**5.3**	J
PETROLEUM HYDROCARBONS (mg/kg)														
DIESEL RANGE ORGANICS C10-C28	NE	NE	4.2	U	**7.1**	J	4.1	U	4.3	U	4.2	U	4.1	U

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

LANL (2012) ESL values represented as: No Effect ESL / Low-Effect ESL (e.g., 0.05 / 0.5 mg/kg for antimony)

LANL (2012) ESL Exceeded

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *Los Alamos National Laboratory (LANL), 2012, ECORISK Database, LA-UR-12-24548, Release 3.1, October.*

ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
ESL = ecological screening level
HAFB = Holloman Air Force Base
IS = investigative soil (sample)
J = estimated value
LANL = Los Alamos National Laboratory
mg/kg = milligrams per kilogram
NE = not established
NMED = New Mexico Environment Department
NSV = no screening value (available)
RCRA = Resource Recovery and Conservation Act
RFI = RCRA Facility Investigation
U = not detected at the detection limit shown
VQ = validation qualifier

bis(2-Ethylhexyl) phthalate (mg/kg)	d_bis(2-Ethylhexyl) phthalate (mg/kg)	Antimony (mg/kg)	d_Antimony (mg/kg)
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1				**General UCL Statistics for Data Sets with Non-Detects**								
2			**User Selected Options**									
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5			Confidence Coefficient	95%								
6			Number of Bootstrap Operations	2000								
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Antimony	6	1	16.67%		3.7	0.99	1.2	1.065833	1.291048	1.211304	0.741496	2.204853	1.013578	0.944597	0.788	0.524	0.579				U
bis(2-Ethylhexyl) phthalate	6	1	16.67%		0.144	0.081	0.085	0.0585	0.041894	0.716135	0.050952	1.664188	0.058009	0.03157	0.788	0.514	0.532				U

Median	95uclnorm	sdln	h	95uclln	95uclnp	95quantno	95quantln	95quantnp	utl95norm	utl95ln	quant95np	Units	cohenmnn	cohenstdn	cohenmnlr	cohenstdln	aitchmnno	aithcstdno	aitchmnln	aitchstdln	poisspl	Pathway	BootStrap	AMQ at	0.95%
1.1	2.127901	0.790661	3.448609	3.431151	3.7	3.189607	2.722504	3.7	5.856911	13.94411	3.7	mg/kg										4	1.63195		
0.0835	0.092964	0.509338	2.661717	0.106366	0.144	0.127415	0.117771	0.144	0.213968	0.33732	0.144	mg/kg										4	0.080479		

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

Analyte		Sample Number	OTC544-IS-0001-070612		OTC544-IS-0003-070612		OTC544-IS-0005-070612		OTC544-IS-0007-070612		OTC544-IS-0008-070612-FD		OTC544-IS-0010-070612	
		Sample Date	7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012		7/6/2012	
		Location	Station 1, tank influent		Station 2, septic tank		Station 3, tank effluent		Station 4, leach field		Station 4, leach field		Station 4, leach field	
		Depth (ft bgs)	3 - 5		7 - 9		3 - 5		3 - 5		3 - 5		0 - 2	
	Background Values - Soil (mg/kg)[a]	LANL (2012) ESLs (mg/kg)[b]	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ	Result	VQ
PERCENT SOLIDS	NE	NE	**79.9**		**81.9**		**82.2**		**77.5**		**78.7**		**80.2**	
SEMIVOLATILES (mg/kg)														
BIS(2-ETHYLHEXYL) PHTHALATE	NE	0.02 / 0.2	0.144	J	0.081	U	0.081	U	0.085	U	0.084	U	0.083	U
METALS (mg/kg)														
ALUMINUM	13722	pH Dependent	**2460**		**5770**		**3700**		**1290**		**1500**		**2310**	
ANTIMONY	1.6	0.05 / 0.5	1.1	U	1.2	U	0.99	U	1	U	3.7	J	1.1	U
BARIUM	169.3	110 / 260	**32.2**	J	**41.8**	J	**42.9**	J	**25.6**	J	**27.8**	J	**29.2**	J
CALCIUM	317332	NSV	**214000**		**218000**		**231000**		**263000**		**266000**		**251000**	
CHROMIUM	25	28 / 280	**2.4**	J	**6.1**		**3.5**	J	**0.99**	J	0.89	U	**1.7**	J
COBALT	7.7	13 / 130	**0.83**	J	**1.9**	J	**1.2**	J	0.51	U	**0.55**	J	**0.87**	J
COPPER	13	15 / 46	**2**	J	**2.2**	J	**1.8**	J	**1.7**	J	**1.8**	J	**2.2**	J
IRON	23049	NSV	**2160**		**5530**		**3490**		**1050**		**1240**		**1870**	
LEAD	10.9	14 / 28	**1.1**	J	**3**	J	**1.8**	J	0.51	U	0.89	U	**0.64**	J
MAGNESIUM	16991	NSV	**5120**		**3380**		**4520**		**4110**		**4260**		**4330**	
MANGANESE	393	220 / 1,100	**47.1**		**72.7**		**66.5**		**20.4**		**23.3**		**40.5**	
NICKEL	17.4	9.7 / 19	**1.7**	J	**5**	J	**2.6**	J	**1.2**	J	**1.3**	J	**1.7**	J
POTASSIUM	5077	NSV	**610**	J	**1760**	J	**930**	J	**432**	J	**468**	J	**614**	J
SODIUM	5196	NSV	600	U	660	U	**1240**	J	**1420**	J	**1360**	J	**1070**	J
VANADIUM	42.6	0.025 / 0.25	6.4	J	9.6	J	8.7	J	3.8	J	4.1	J	4.9	J
ZINC	54.6	48 / 480	**5**	J	**13.9**		**7.5**	J	2.6	U	4.4	U	**5.3**	J
PETROLEUM HYDROCARBONS (mg/kg)														
DIESEL RANGE ORGANICS C10-C28	NE	NE	4.2	U	**7.1**	J	4.1	U	4.3	U	4.2	U	4.1	U

Table A
Soil (0 to 10 feet) Analytical Data Compared to Ecological Screening Values
Building 1176 (OT-C544) RFI Report
Holloman Air Force Base, New Mexico

LANL (2012) ESL values represented as: No Effect ESL / Low-Effect ESL (e.g., 0.05 / 0.5 mg/kg for antimony)

LANL (2012) ESL Exceeded

Bold = parameter detected

[a] *NMED, 2012. "Correction, Approved Basewide Background Levels, Holloman Air Force Base, EPA ID# NM6572124422, HWB-HAFB-09-004," Letter to D. Scruggs, Chief, Environmental Restoration Program, HAFB from J.E. Kieling, Acting Chief, Hazardous Waste Bureau, NMED, March 1.*

[b] *Los Alamos National Laboratory (LANL), 2012, ECORISK Database, LA-UR-12-24548, Release 3.1, October.*

ft bgs = feet below ground surface
EPA = U.S. Environmental Protection Agency
ESL = ecological screening level
HAFB = Holloman Air Force Base
IS = investigative soil (sample)
J = estimated value
LANL = Los Alamos National Laboratory
mg/kg = milligrams per kilogram
NE = not established
NMED = New Mexico Environment Department
NSV = no screening value (available)
RCRA = Resource Recovery and Conservation Act
RFI = RCRA Facility Investigation
U = not detected at the detection limit shown
VQ = validation qualifier

NATIONVIEW

DAILY QUALITY CONTROL REPORT

Project Number/Name: SD-08 (Former Building 133 Washrack) quarterly groundwater sampling (10-0004) DQCR No.:2

Date: 4/24/2012 Time On-Site: 0730 Time Off-Site: 1830 Site Name: SD-08

Weather: Clear Temperature: 60-82 Wind: None

Contractor Personnel On-Site: Wyeth Bowdoin (Bhate) and Brian Parrish (NationView)

Visitors On-Site:

Summary of Work Performed: Sampled MW-08-04, MW-08-05, MW-08-06 and MW-08-08 for VOC, TAL metals (dissolved and total) and TDS. IDW was disposed of into the NationView Weir tank

Level of Health & Safety Protection: Level D

Equipment Used: Solinist water level indicator, YSI and Lamotte turbidity meter

Calibration(s) Performed: YSI and Lamotte turbidity meter calibrations

Equipment Problem(s)/Remedies: Replaced DO sensor

Samples Collected* : All of the following for VOC, TAL metals (dissolved and total) and TDS

MW-08-04	4/24/2012	1400
MW-08-05	4/24/2012	1545
MW-08-06	4/24/2012	1120
MW-08-08	4/24/2012	1230

Sample Collection Method(s): Low Flow and bailer used for the collection of VOCs . Filter used for TAL metals dissolved

Quality Control: None

Proposed Schedule for tomorrow: Sample SD-08 monitoring wells

Additional Remarks:

Signature: Wyeth Bowdoin **Job Title:** Geologist

*Indicates sample media: groundwater, surface water, soil or sediment; sample type: composite, grab, split, duplicate, rinsate, and sample I.D. numbers

NATIONVIEW

DAILY QUALITY CONTROL REPORT

Project Number/Name: SD-08 (Former Building 133 Washrack) quarterly groundwater sampling (10-0004) DQCR No.:3

Date: 4/25/2012 Time On-Site: 0730 Time Off-Site: 1800 Site Name: SD-08

Weather: Partly Cloudy Temperature: 70-90 Wind: Calm

Contractor Personnel On-Site: Wyeth Bowdoin (Bhate) and Brian Parrish (NationView)

Visitors On-Site:

Summary of Work Performed: Sampled MW-08-01, MW-08-02, MW-08-03, MW-08-07, S10-MW01 and SWMU183-MW03 for VOCs, TAL metals (dissolved and total) and general chemistry for monitoring wells S10-MW01 and SWMU183-MW03 only.

All IDW was placed into a 55-gallon steel drum on site and then pumped into the Nation View Weir Tank for disposal.

Level of Health & Safety Protection: Level D

Equipment Used: Solinist water level indicator, YSI and Lamotte turbidity meter

Calibration(s) Performed: YSI calibration and Lamotte turbidity meter calibration

Equipment Problem(s)/Remedies: None

Samples Collected* : All of the following for VOC, TAL metals (dissolved and total) and general chemistry

MW-08-01/-01A 1/26/201 1110
MW-08-02 1/26/2012 1015
MW-08-03 1/26/2012 0815
MW-08-07 1/26/2012 0915
S10-MW01 1/26/2012 1500
SWMU183-MW03/MS/MSD 1/26/2012 1330

Sample Collection Method(s): Low Flow and bailer used for the collection of VOCs .

Quality Control: MW-08-01 Dup and S10-MW01 MS-MSD

Proposed Schedule for tomorrow: Pack and ship all SD08 groundwater samples to be picked up from the field office at ~1500 tomorrow and mob back to Denver

Additional Remarks:

Signature: Wyeth Bowdoin **Job Title:** Geologist

*Indicates sample media: groundwater, surface water, soil or sediment; sample type: composite, grab, split, duplicate, rinsate, and sample I.D. numbers

NATIONVIEW

DAILY QUALITY CONTROL REPORT

Project Number/Name: SD-08 (Former Building 133 Washrack) quarterly groundwater sampling (10-0004) DQCR No.:4

Date: 4/26/2012 Time On-Site: 0700 Time Off-Site: 1300 Site Name: SD-08

Weather: Clear Temperature: 60-85 Wind: Calm

Contractor Personnel On-Site: Wyeth Bowdoin (Bhate)

Visitors On-Site:

Summary of Work Performed: Packed and shipped groundwater samples. Collected GIS data from Dave Rizzuto. Conducted a quick site walk with John Hymer to get an idea of accessibility to SS-18 proposed monitoring well locations. Mobilized from Holloman AFB to Denver.

Level of Health & Safety Protection: Level D

Equipment Used: Personal Vehicle

Calibration(s) Performed: NA

Equipment Problem(s)/Remedies: None

Samples Collected* : None

Sample Collection Method(s): NA

Quality Control: NA

Proposed Schedule for tomorrow: NA

Additional Remarks:

Signature: **Job Title:** Geologist

*Indicates sample media: groundwater, surface water, soil or sediment; sample type: composite, grab, split, duplicate, rinsate, and sample I.D. numbers