DEPARTMENT OF THE AIR FORCE
27TH SPECIAL OPERATIONS MISSION SUPPORT GROUP (AFSOC)
CANNON AIR FORCE BASE NEW MEXICO

Colonel David C. Piech
Commander
110 E Sextant Avenue Suite 1098
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MAY 3 1 2013

JUN 2013

Mr. Daniel Comeau
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East Bldg 1
Santa Fe NM 87505-6063

Dear Mr. Comeau

Attached is the *"2012 Annual Institutional Controls Report"*. If you have any questions regarding this submittal, please contact Mr. Ronald Lancaster, Chief, Installation Management Flight at (575) 784-1146 or Mr. Rick Crow, Environmental Element Chief at (575) 784-6383.

Sincerely,

DAVID C. PIECH, Colonel, USAF
Commander

Attachment:
2012 Annual Institutional Controls Report.

cc:
Environmental Protection Agency, Region VI, Ms. Wendy Jacques w/o Attachment

2012 ANNUAL INSTITUTIONAL CONTROLS REPORT

SITES LF-02, FT-06, SD-12, SD-15, SD-17, SD-20, SWMU-2, SWMU-4, SWMU-6, SWMU-31, AND SWMU-102

CANNON AIR FORCE BASE, NEW MEXICO

Prepared for:

27 SOCES/CEAN
Cannon Air Force Base, New Mexico

Prepared by:

1608 13th Avenue South, Suite 300
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1002 N. Eglin Parkway
Shalimar, Florida 32579

Contract No. FA8903-10-D-8594
Delivery Order Number: 0034

Bhate Project No.: 9110129

April 2013

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AND SWMU-102

CANNON AIR FORCE BASE, NEW MEXICO

REVIEW SHEET

		4-30-2013
Jonathan Kramer **Geologist** Trinity Analysis & Development Corp.	Sign	Date
		4-30-2013
Tracy L. Walker, P.G. Sr. Project Manager Bhate Environmental Associates, Inc.	Sign	Date

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2012 ANNUAL INSTITUTIONAL CONTROLS REPORT

SITES LF-02, FT-06, SD-12, SD-15, SD-17, SD-20, SWMU-2, SWMU-4, SWMU-6, SWMU-31,

AND SWMU-102

CANNON AIR FORCE BASE, NEW MEXICO

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Appendices

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ACRONYMNS AND ABBREVIATIONS

AFB	Air Force Base
AGE	Aerospace Ground Equipment
bgs	Below ground surface
Bhate	Bhate Environnemental Associates, Inc.
BRA	Baseline Risk Assessment
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CAC	Corrective Action Complete
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CMS	Corrective Measures Study
COPC	Contaminants of Potential Concern
COPEC	Chemicals of Potential Ecological Concern
CSM	Conceptual Site Model
DAF	Dilution/attenuation Factor
DPT	Direct Push Technology
DRO	Diesel range organics
ERA	Ecological Risk Assessment
ERP	Environmental Restoration Program
GRO	Gasoline range organics
HSWA	Hazardous and Solid Waste Amendments
IC	Institutional Controls
IRP	Installation Restoration Program
LF-02	Landfill No. 2
LUC	Land Use Control
mg/kg	Milligrams per kilogram
MTBE	Methyl tert-butyl ether
NMED	New Mexico Environment Department
OVA	Organic Vapor Analyzer
PAH	Polycyclic aromatic hydrocarbons
PCB	Polychlorinated biphenyls
PID	Photoionization detector
P.G.	Professional Geologist
POL	Petroleum, Oil, and Lubricants
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
SI	Site Investigation
SSL	Soil Screening Levels
SVOC	Semi-volatile organic compounds
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TOC	Total Organic Carbon

Trinity	Trinity Analysis and Development Corporation
TRPH	Total Recoverable Petroleum Hydrocarbons
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile organic compound
XRF	X-ray fluorescence

1 INTRODUCTION

This annual report presents the status of the annual institutional controls (IC) inspections at 11 sites at Cannon Air Force Base (AFB), located in Curry County, near Clovis, New Mexico (Figure 1). The annual institutional controls inspections were conducted by Trinity Analysis & Development Corporation (Trinity), under contract to Bhate Environmental Associates, Inc. (Bhate), on October 16 and 17, 2012, at the following sites: LF-02, FT-06, SD-12, SD-15, SD-17, SD-20, SWMU-2, SWMU-4, SWMU-6, SWMU-31, and SWMU-102. The locations of the 11 sites are shown on Figure 2. LF-02, SD-17, SWMU-2, SWMU-4, SWMU-6, and SWMU-102 have received approval from the New Mexico Environment Department (NMED) for Corrective Action Complete with Controls. The inspections were conducted to document that land use has not changed from industrial to residential. Field observations pertaining to the inspections were recorded on individual *Land Use Control (LUC) Site Inspection Reports* which are provided in Appendix A of this report. Photographs documenting site conditions during the 2012 Annual inspection are provided in Appendix B of this report. Descriptions of each site, including site background and history, are provided in Section 2. Conclusions and recommendations are presented in Section 3 and references used in developing this report are included in Section 4.

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2 SITE DESCRIPTIONS

2.1 Site LF-02 (SWMU-82) Landfill No. 2

Landfill No. 2 (LF-02) is an unlined, inactive, cut-and-fill landfill located in the northeast corner of the Base, just beyond the end of the primary southwest-northeast oriented runway, approximately 500 feet northeast of Perimeter Road (Figure 2). Coordinates for the approximate center of the site are Latitude 34°24′01.54″ N and Longitude 103°17′55.03″ W.

2.1.1 Site Description and History

2.1.1.1 Physical Setting

LF-02 is approximately 1,500 feet long and 450 feet wide (approximately 15 acres), lying approximately 75 feet west of the Base's eastern boundary fence and 75 to 100 feet south of the Base's northern boundary fence. As of the October 2012 site inspection, the site an open field covered with prairie grass species which is mowed periodically.

2.1.1.2 History

LF-02 was a base landfill that received wastes from 1946 to 1947 and from 1952 to 1959. The period of temporary inactivity from 1947 to 1952 was the time during which the base was on deactivated status. Based on review of historical aerial photographs, LF-02 was found to consist of two distinct portions: an eastern portion trended in a north-south direction, and a western portion trended in an east-west direction. Records indicated the mode of operation at this site was for wastes to be deposited in trenches, burned, and buried. Waste materials received at this landfill reportedly included domestic and industrial solid wastes including waste oils and solvents, paint strippers and thinners, pesticide containers, and empty cans and drums.

2.1.2 Summary of Environmental Restoration Program (ERP) Activities

2.1.2.1 Past

- 1982-1983 Installation Restoration Program (IRP) Phase I:

  In 1982-1983, a records search including a detailed review of pertinent installation records, contact with government agencies, and site visits to identify and fully evaluate suspected problems associated with past hazardous material disposal sites was performed. Results of the records search identified several sites on Cannon AFB which warranted further investigation. Landfill No. 2 was designated as Installation Restoration Program (IRP) Site Number 2.

- 1984-1985 IRP Phase II:

  The purpose of the Phase II (Stage 1) investigation conducted from November 1984 to April 1985 was to determine if environmental contamination had resulted from waste disposal practices, fuel spills/leaks, and fire training activities at Cannon AFB. In addition, the investigation included an estimate of the magnitude and extent of contamination, the identification of potential environmental consequences of migrating pollutants; and the

recommendation for any additional investigation necessary to identify the magnitude, extent, and direction of movement of- discovered contaminants.

Results of the Phase II investigation documented the presence of oil and grease in the upper soil zone at LF-02. Metals analyses indicated that metals were generally at background levels except for selenium in the shallow samples. No groundwater contamination was found as a result of this investigation.

- 1987 Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA)/Site Investigation (SI)

  In May 1987 visual site inspections were performed to verify and determine the location of all Solid Waste Management Units (SWMUs) on Cannon AFB as required for RCRA hazardous waste management facility permitting under the RCRA Hazardous and Solid Waste Amendments (HSWA) of 1984. The objective of the evaluation was to determine whether there had been, or was likely to be, releases of hazardous wastes or hazardous materials and to provide information to establish priorities for a subsequent RCRA Facility Investigation (RFI), if needed.

  No samples were taken during the 1987 inspection and LF-02 was designated as SWMU-82.

- 1993 RFI/Baseline Risk Assessment (BRA):

  A geophysical survey was conducted as part of the 1993 RFI to identify landfill cell locations which lead to a subsurface soil investigation based on the interpreted cells. Landfill materials were excavated and field screened with an organic vapor analyzer (OVA). No readings above background level were recorded. The landfill material and cap were replaced.

  An additional 27 borings were drilled to depths of 76 feet below ground surface (bgs). Low levels of two volatile organic compounds (VOCs), toluene and total xylenes, were detected in surface soils. Several other VOCs were detected in subsurface soils. Low levels of 25 semi-volatile compounds (SVOCs); Aroclor 1254; pesticides 4,4-DDE and 4,4-DDT; total recoverable petroleum hydrocarbons (TRPH); and several metals were detected in surface and subsurface soils.

  A Baseline Risk Assessment (BRA), based on the 1993 RFI, identified a small number of VOCs and SVOCs as contaminants of potential concern (COPCs). Subsequent ecological risk screening indicated that the COPCs identified did not pose an unacceptable risk to the environment.

- 2007 RFI:

  A conceptual site model (CSM) was developed based on historical site information. Based on localized topography and landfill depth, two primary release mechanisms by which COPCs could potentially be released from LF-02 were identified: 1) buried landfill wastes could emit volatiles; and, 2) mixing and/or infiltration-percolation of waste related chemicals could be released by direct contact during excavation activities, infiltration to groundwater, and by volatilization or wind erosion if subsurface soils were exposed.

Additionally, the results and conclusions of previous investigations were re-evaluated using appropriate methods and screening criteria. Historical data for LF-02 were compared to NMED Soil Screening Levels (SSLs). TRPH, VOCs, pesticides, and polychlorinated biphenyls (PCBs) did not exceed SSLs. Maximum concentrations of the SVOCs naphthalene and phenanthrene exceeded soil-to-groundwater SSLs. Impacts to groundwater were considered minimal because the depth to groundwater is greater than 250 feet. Benzo(a)pyrene exceeded the residential SSL, but was not considered a COPC because it was detected in subsurface soil (approximately 20 feet bgs) where residential exposure was unlikely.

None of the SVOCs were considered to be COPCs for this site. Maximum concentrations of antimony, arsenic, iron, and mercury exceeded soil-to-groundwater SSLs. Manganese exceeded the construction worker SSL. All concentrations were under or near Cannon AFB background levels. In response to the work completed as part of the 2007 RFI, a letter dated May 14, 2008, from NMED stated that the RFI report was accepted, and that Cannon AFB may petition for Corrective Action Complete (CAC) with Controls for Landfill No. 2.

- 2011 NMED Approval:

  On February 23, 2011, NMED approved the site for CAC with Controls.

2.1.2.2 Current

- Annual site inspection and report submitted to NMED
- Exit Strategy and Timelines: LUCs in effect in perpetuity

2.1.2.3 Future

- Continue site inspections to ensure compliance with ICs.

2.2 Site FT-06 (SWMU-78) – Fire Dept. Training Area No. 1

Fire Department Training Area No. 1 is a former Cannon AFB fire department training area located in the northeast corner of the base, south of the railroad tracks and approximately 485 feet northeast of Perimeter Road (Figure 3). Coordinates for the approximate center of the site are Latitude 34°24′08.47″ N and Longitude 103°18′10.32″ W.

2.2.1 Site Description and History

2.2.1.1 Physical Setting

Fire Department Training Area No. 1 is a circular area with a diameter of approximately 100 feet (approximately 0.18 acres), lying approximately 300 feet south of the base's northern boundary fence and approximately 1,580 feet east of the base’s eastern boundary fence. As of the October 2012 site inspection, the site appears as an open field covered with prairie grass species which is mowed periodically.

2.2.1.2 History

The Cannon AFB Fire Department Training Area No. 1 operated from 1959 to 1968. The site consists of an unlined surface area approximately 100 feet in diameter. During the period of operation, approximately 300 gallons of waste oils, solvents, and fuels were poured onto the soil, on average twice monthly to create fires for personnel training purposes. Reportedly, on some occasions the ground was pre-saturated with water prior to pouring the waste fluids onto the ground. It is assumed that most of the fluids would have been consumed in training exercise fires, but that some residual quantities may have percolated into the subsurface. Contaminants of concern were components of fuel and waste oil.

2.2.2 Summary of ERP Activities

2.2.2.1 Past

- 1982-1983 IRP Phase I:

  In 1982-1983 a records search including a detailed review of pertinent installation records, contact with government agencies, and site visits to identify and fully evaluate suspected problems associated with past hazardous material disposal sites was performed. Results of the records search identified several sites on Cannon AFB which warranted further investigation. Fire Department Training Area No. 1 was designated as IRP Site Number 6.

- 1984-1985 IRP Phase II:

  The purpose of the Phase II (Stage I) investigation conducted from November 1984 to April 1985 was to determine if environmental contamination had resulted from waste disposal practices, fuel spills/leaks, and fire training activities at Cannon AFB. In addition, the investigation included an estimate of the magnitude and extent of contamination; the identification of potential environmental consequences of migrating pollutants; and the recommendation for any additional investigation necessary to identify the magnitude, extent, and direction of movement of discovered contaminants.

  During the Phase II investigation, two deep soil borings were drilled at the site and samples for chemical analyses were collected to evaluate the impact of past and ongoing activities and to define site-specific hydrogeologic conditions. Soil samples collected during this investigation were analyzed for oil and grease, lead, and VOCs.

  Results of the Phase II investigation documented the presence of oil and grease in the upper soil zone and determined that metals were generally at background levels except for selenium in the shallow samples. No VOCs were detected.

- 1987 RFA/SI:

  In May 1987 visual site inspections were performed to verify and determine the location of all SWMUs on Cannon AFB as required for RCRA hazardous waste management facility permitting under the RCRA Hazardous and Solid Waste Amendments of 1984. The objective of the evaluation was to determine whether there had been, or was likely to be, a release of

hazardous wastes or hazardous materials and to provide information to establish priorities for a subsequent RFI, if needed. No samples were taken during the 1987 inspection.

Fire Training Area No. 1 was designated as Appendix I SWMU-78 and due to the unlined nature of the area, and a high potential for past disposal of hazardous wastes to have adversely affected site soils was noted. The potential for releases to groundwater was considered to be lower due to the presence of caliche layers possibly inhibiting downward migration of hazardous constituents. Suggested further action was to conduct additional soil sampling to determine if soil contamination was still present on the site.

- 1989 Cannon AFB RCRA Part B Permit:

  Fire Training Area No. 1 is identified in the 1989 Cannon AFB RCRA Part B Permit as a high priority site requiring a RFI. Because of the corrective action precedent established by the Hazardous and Solid Waste Amendments of 1984 (HSWA), the procedures of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) IRP approach, including investigations and/or Remedial Actions for all Cannon AFB IRP sites identified as SWMUs, were changed to meet the applicable requirements of the HSWA under the RCRA Corrective Action Plan.

- 1991 RFI/BRA:

  Surface and subsurface soils were collected for chemical and gradation analysis during the 1991 RFI. Two deep borings were advanced to depths of approximately 100 feet. A total of 21 subsurface soils samples and 6 surface soil samples were collected for chemical analysis. In general, the samples were analyzed for VOCs, SVOCs, PCBs, pesticides, and TRPH. In addition, samples from one soil boring were also analyzed for total organic carbon (TOC).

  Pesticides were detected in all surface samples from within the site boundary and from subsurface borings up to 12 feet bgs. Two VOCs/SVOCs reported were dismissed as low-level laboratory artifacts. Elevated TRPH levels were detected in numerous surface soil samples and at moderate levels to depths of 4 feet bgs. The five surface samples within the site boundary contained concentrations of aluminum, arsenic, cadmium, chromium, copper, iron, lead, manganese, nickel, and zinc at levels slightly exceeding or close to background levels. Lead and chromium were also detected above background levels from the surface soil sample outside the site boundaries. Chromium recoveries in the majority of surface samples were comparable to regional levels.

  Lead, zinc, TRPH, and the pesticides 4,4-DDD and 4,4-DDE were retained as COPCs in soils at the site. The BRA assessed potential adverse human health and ecological effects by comparing analytical data to risk-based RFI criteria and proposed RCRA action levels, and by calculating site-specific health risks, where appropriate. The BRA concluded that potential impacts to human health and to the environment were insignificant at the site. Based on the analytical results and the BRA conclusions, the RFI report recommended that no further investigation or action was warranted at Fire Department Training Area No. 1.

- 1995 Phase II Appendix I Supplemental RFI:

  A supplemental RFI was conducted subsequent to the 1991 RFI to provide more information on other sites included in the investigation. No additional work was performed at Fire Department Training Area No. 1 during this supplemental investigation.

- 2007 RFI:

  A CSM was developed based on historical site information. The most significant exposure pathways include inhalation of fugitive dust and direct contact with soil, resulting in incidental ingestion or dermal absorption of chemicals from soil. Human receptors for these pathways include adult general duty workers and construction workers. Future residential exposure is unlikely because of the industrial nature of this site and the surrounding area. In addition, the site is less than 1/2 acre, so the potential for major soil excavation and future construction of residential homes within the area of this SWMU is low. The adult base worker who potentially visits the site a few days per year for grounds keeping activities and/or a short term excavation worker are expected to be the most significant receptor population under current and future exposure conditions. Although emission of VOCs from soil is plausible, the quantities are expected to be minute due to mixing and dilution with ambient air. Fugitive dust emissions in the form of dust/particulates may contain site-related chemicals from surface and subsurface soil.

  The primary release mechanisms by which chemicals of concern could potentially be released from Fire Department Training Area No. 1 are direct contact during soil disturbance or excavation activities and infiltration to groundwater affecting the potable water supply. The data used for screening against SSLs was limited to samples collected from the 0 to 15-foot bgs depth intervals.

  Additionally, the results and conclusions of previous investigations were re-evaluated using current methods and screening criteria. The RFI review indicated that TRPH and lead exceed the current NMED residential SSLs. TPH and lead were detected above the NMED screening level in the one shallow soil sample collected as part of an RFI previously completed at the site.

  Based on comparison of current maximum site soil concentrations with applicable human health-based SSLs, no COPCs or excess cumulative risks were identified for the exposure scenarios applicable to this site. No unacceptable ecological risks were identified during previous investigations or associated risk evaluation. The RFI report was reviewed by NMED, and based on NMED comments issued in reference to the above mentioned lead and TRPH levels; additional sampling at Fire Department Training Area No. 1 was suggested to further characterize the site.

- 2009 RFI Addendum:

  Near surface samples were collected during the 2009 RFI Addendum near previous sampling locations that exhibited elevated levels of lead and TRPH. Three borings were advanced to 2 feet bgs and samples were collected at 0.5 foot intervals for a total of 12 samples. Samples were screened based on staining and odor and photoionization detector (PID)

readings. Lead samples were submitted to the laboratory based on x-ray fluorescence (XRF) field screening results. Three soil samples and one duplicate sample were submitted for TRPH-diesel range organics (DRO), TRPH-gasoline range organics (GRO), and lead.

With the exception of lead which exceeded residential and industrial screening levels in the 0-6-inch interval at one near surface soil boring, no additional elevated lead or TRPH levels were identified in analytical results. Based on the findings of the 2009 RFI Addendum fieldwork, the elevated TRPH levels that were identified by previous investigations no longer appear to be present at the site. The decrease in the TRPH levels can likely be attributed to natural attenuation of TRPH in the soil. Elevated lead was observed above the NMED residential SSL in two soil samples and above the industrial SSL in one soil sample collected during all investigations. Because the average lead concentration at the site is below the residential screening level for lead and only a single lead concentration exceeded the industrial SSL, CAC with Controls was recommended for Fire Department Training Area No. 1.

- 2010 Final RFI Addendum:

  The May 2010, Final RFI Addendum Report was approved by the NMED on June 7, 2010.

2.2.2.2 Current

- Annual site inspection and report submitted to NMED
- Exit Strategy and Timelines: LUCs in effect in perpetuity

2.2.2.3 Future

- Continue site inspections to ensure compliance with ICs.

2.3 Site SD-12 (SWMU-85) – S. Playa Lake Stormwater Collection Point

The South-Playa Lake Stormwater Collection Point is a naturally occurring 9-acre playa near the southwest corner of the base (Figure 4), located just south of the primary southwest-northeast runway, approximately 990 feet north of Perimeter Road. Coordinates for the approximate center of the site are Latitude 33°22′31.20″ N and Longitude 103°19′37.14″ W.

2.3.1 Site Description and History

2.3.1.1 Physical Setting

The South-Playa Lake Stormwater Collection Point is a 9-acre circular unlined surface impoundment which lies approximately 1,000 feet north of the base's southwestern boundary fence and approximately 2,990 feet east of the base's western boundary fence. As of the October 2012 site inspection, the site is covered with distinctly green foliage and isolated areas of rip-rap.

2.3.1.2 History

The South-Playa Lake Stormwater Collection Point is a naturally occurring 9-acre playa which has received stormwater runoff from the flight line since the base was activated in 1943. Flight line stormwater runoff and wash-water from an aircraft wash-rack oil/water separator travel through a series of drainage channels toward the center of the site where it either evaporates or percolates into the soil. Due to the nature of flight line activities, it is suspected petroleum based materials have been carried to the site with stormwater runoff.

2.3.2 Summary of ERP Activities

2.3.2.1 Past

- 1982-1983 IRP Phase I:

  A records search including a detailed review of pertinent installation records, contact with government agencies, and site visits to identify and fully evaluate suspected problems associated with past hazardous material disposal sites, was performed in 1982-1983. Results of the records search identified several sites on Cannon AFB which warranted further investigation. The South-Playa Lake Stormwater Collection Point was designated as IRP Site Number 12.

- 1984-1985 IRP Phase II:

  A Phase II (Stage I) investigation was conducted from November 1984 to April 1985 to determine if environmental contamination had resulted from waste disposal practices, fuel spills/leaks, and fire training activities at Cannon AFB. In addition, the investigation included an estimate of the magnitude and extent of contamination, the identification of potential environmental consequences of migrating pollutants, and the recommendation for any additional investigation necessary to identify the magnitude, extent, and direction of movement of- discovered contaminants.

  The Phase II (Stage I) investigation at the South-Playa Lake Stormwater Collection Point consisted of three hand-augered 5-foot deep boreholes, with two being located near the center of the basin and the remaining near the inlet. Soil samples were collected at 3 and 4 feet bgs. Saturated conditions prevented the retrieval of deeper samples. Samples were analyzed for priority pollutant metals plus iron, nickel, and zinc; oil and grease; and VOCs. No VOCs were detected in any of the samples and only one sample contained a low concentration of oil/grease. Variable metals concentrations were found in the soil with the concentration of heavy metals, especially lead, appearing to increase toward the center of the basin. The study recommended the installation of deeper soil borings in order to define the confining caliche or sand layer and to determine the migration potential of metals.

  Human health and ecological screenings concluded that the metals concentrations observed at the site are indicative of background metals concentrations. Ecological screening concluded that selenium was present within the range of normal background concentrations, but at levels that may be considered toxic to wildlife.

- 1987 RFA/SI:

  Visual site inspections were performed in May 1987 to verify and determine the location of all SWMUs on Cannon AFB as required for RCRA hazardous waste management facility permitting under the RCRA HSWA of 1984. The objective of the evaluation was to determine whether there had been, or was likely to be, release of hazardous wastes or hazardous materials and to provide information to establish priorities for a subsequent RFI, if needed. No samples were taken during the 1987 inspection.

  The South-Playa Lake Stormwater Collection Point was designated as Appendix I, SWMU-85 and due to the potential for soil and groundwater contamination, further investigation was recommended.

- 1987-1988 Remedial Investigation (RI):

  Based on the results of an earlier field investigation and a subsequent site investigation, a RI was conducted at the South-Playa Lake Stormwater Collection Point from December 1987 to February 1988. The RI was conducted to characterize and to define the vertical extent of apparent heavy metals concentrations. The objective of the RI was to collect data to characterize three areas at the south stormwater collection point: the discharge channel, the active playa, and the fill area (containing broken concrete from apron and runway demolitions). Eight boreholes were drilled and sampled at multiple intervals up to 70 feet bgs. Samples were analyzed for VOCs and target analyte list (TAL) metals. No organic chemicals were detected in the samples analyzed.

  Four metals (arsenic, barium, mercury, and selenium) were reported above background levels in samples collected during the RI. However, the results did not support a trend towards increasing metals concentrations toward the center of the basin and indicated that elevated arsenic concentrations may be attributable to inter-element interference. Additional toxicity test results indicated that the concentrations of metals detected would not be expected to leach out of site soils at significant concentrations. The ecological risk assessment (ERA) also identified barium, mercury, and selenium as COPCs; however, only mercury and selenium were found in the top 5 feet of soil. Disturbance of subsurface soil by wildlife due to tunneling and burrowing was assumed to occur to a maximum depth of 5 feet bgs. Mercury was only detected at one location, which was considered isolated and therefore not indicative of site contamination. Selenium has a very low toxicity level and was detected at concentrations considered toxic to wildlife.

- 1989 Cannon AFB RCRA Part B Permit:

  The South-Playa Lake Stormwater Collection Point is identified in the 1989 Cannon AFB RCRA Part B Permit as a high priority site requiring a RFI. Because of the corrective action precedent established by the HSWA, the procedures of the CERCLA IRP approach, including investigations and/or Remedial Actions for all Cannon AFB IRP sites identified as SWMUs, were changed to meet the applicable requirements of the HSWA under the RCRA Corrective Action Plan.

- 2007 RFI:

  A CSM was developed based on historical site information. Based on localized topography and landfill depth bgs, two primary release mechanisms by which COPCs could potentially be released from the South Playa Stormwater Collection Area were identified: 1) direct contact during soil disturbance or excavation activities and 2) infiltration to groundwater affecting the potable water supply.

  Under current use, direct contact with subsurface soils is an incomplete exposure pathway because no contact occurs due to the presence of significant amounts of water. It is unlikely that future construction would occur in this area due to: 1) the location of the Stormwater Collection Point (proximity to runways) and 2) the presence of a naturally occurring playa lake which makes the area unsuitable for building construction. In addition, the highest reported contamination is at the 10 to 11.5 foot depth interval, deeper than typical construction activities would occur. Even though exposure to the subsurface soil is unlikely, it was evaluated in the unlikely event that the subsurface soils are disturbed and/or mixed with surface soils. The data used for screening against SSLs was limited to samples collected from the 0 to 1 foot through 10 to 11.5 foot bgs intervals. The most significant potential exposure pathways include direct contact with soil, resulting in incidental ingestion or dermal absorption of chemicals from soil over a short duration and frequency. Human receptors for these pathways are limited to construction workers. Future industrial or residential exposure is unlikely because the potential for major soil excavation and future construction of buildings or residential homes within this site, a natural playa lake, is low.

  Additionally, the results and conclusions of previous investigations were re-evaluated using appropriate methods and screening criteria. The RFI review indicated arsenic results exceeded the NMED residential SSLs in surface and subsurface soil samples. However, it is plausible that the elevated concentrations and elevated reporting limits associated with the arsenic data in the RI may be attributable to inter-element interference that was not properly accounted for during laboratory analysis and may not be representative of site conditions. With the exception of arsenic, no COPCs were identified for the exposure scenario applicable to this site. No unacceptable ecological risks were identified during previous investigations or associated risk evaluations. Recommendations called for additional arsenic analysis on surface and subsurface soil samples.

- 2008 RFI Addendum:

  RFI Addendum fieldwork was performed in 2008, which consisted of collecting one surface soil sample and several subsurface samples. The lone surface soil sample was collected from 0 to 6 inches bgs with a stainless steel hand auger near the large concrete pile in the middle of the stormwater collection point due to the presence of water. Two soil borings were advanced to depths of 15 feet bgs.

  Samples were collected and analyzed for arsenic to determine if the elevated concentrations and elevated reporting limits associated with the arsenic data in the earlier investigations could be attributable to inter-element interference that was not properly

accounted for during laboratory analysis and do represent site conditions. With the exception of one arsenic result, which slightly exceeded Cannon AFB background levels and the residential SSL in the 0 to 5-inch interval at the near surface soil location collected under water, no elevated arsenic concentrations were identified. Based on the RFI Addendum 2008 sample results, the RI data is considered invalid since the arsenic data in the RI may be attributable to inter-element interference. Because the maximum arsenic concentration detected during the RFI is above the residential NMED SSL, but below the industrial NMED SSL CAC with Controls was recommended for SWMU-85.

- 2010 Final RFI Addendum:

  The May 2010, Final RFI Addendum Report was approved by the NMED on June 7, 2010.

2.3.2.2 Current

- Annual site inspection and report submitted to NMED
- Exit Strategy and Timelines: LUCs in effect in perpetuity

2.3.2.3 Future

- Continue site inspections to ensure compliance with ICs.

2.4 Site SD-15 (SWMU-34) – AGE Drainage Ditch

The Aerospace Ground Equipment (AGE) Drainage ditch is an unlined stormwater impoundment occupying approximately 1/3 acre in the north-central portion of the Base in close proximity to the flight line (Figure 5). It is located approximately 250 ft south of Torch Boulevard, parallel with former Building Nos. 191, 192, and 193. Coordinates for the approximate center of the site are Latitude 34°23′38.97″ N and Longitude 103°19′10.44″ W.

2.4.1 Site Description and History

2.4.1.1 Physical Setting

The AGE Drainage ditch is approximately 1,200 feet long and 12 feet wide, lying approximately 3,730 feet south of the base's northern boundary fence and 5,280 feet east of the Base's western boundary fence. It is located approximately 250 feet south of Torch Boulevard. As of the October 2012 site inspection, the site is a grass covered stormwater ditch which is mowed periodically.

2.4.1.2 History

The AGE Drainage ditch was created along the alignment of railroad tracks that were removed in the late 1960s. The ditch receives surface water runoff from the former maintenance pad adjacent to the AGE shop and adjacent parking lots. Spilled fuel, oil, or other chemicals used on the maintenance pad or parking areas washed into the ditch during heavy rains.

2.4.2 Summary of ERP Activities

2.4.2.1 Past

- 1982-1983 IRP Phase I:

  A records search, including a detailed review of pertinent installation records, contact with government agencies, and site visits to identify and fully evaluate suspected problems associated with past hazardous material disposal sites, was performed in 1982 and 1983. Results of the records search identified several sites on Cannon AFB which warranted further investigation. The AGE Drainage ditch was designated as IRP Site Number 15.

- 1984-1985 IRP Phase II:

  A Phase II (Stage I) investigation was conducted from November 1984 to April 1985 to determine if environmental contamination had resulted from waste disposal practices, fuel spills/leaks, and fire training activities at Cannon AFB. In addition, the investigation included an estimate of the magnitude and extent of contamination, the identification of potential environmental consequences of migrating pollutants; and the recommendation for any additional investigation necessary to identify the magnitude, extent, and direction of movement of discovered contaminants.

  During this investigation, two soil borings were drilled at the site to depths of approximately 50 feet. Soil samples for chemical analyses were collected to evaluate the impact of past and ongoing activities and to define site-specific hydrogeologic conditions. Soil samples collected during this investigation were analyzed for oil and grease, lead, and VOCs. The AGE Drainage Ditch samples contained no VOCs. Only one measured oil and grease concentration occurred above the site background level. Elevated levels of lead were detected in the shallow soil of the down-gradient test hole but the isolated surficial occurrence was not considered of environmental concern.

- 1987 RFA/SI:

  Visual site inspections were performed in May 1987 to verify and determine the location of all SWMUs on Cannon AFB as required for RCRA hazardous waste management facility permitting under the RCRA HSWA of 1984. The objective of the evaluation was to determine whether there had been, or was likely to be, release of hazardous wastes or hazardous materials and to provide information to establish priorities for a subsequent RFI, if needed. No samples were taken during the 1987 inspection.

  The AGE Drainage ditch was designated as SWMU-34 and due to the potential for soil and groundwater contamination, further investigation was recommended.

- 1987 Soil Removal Investigation:

  In March 1987, based on results of the Phase II investigation discussed above, a follow-up soil removal investigation was conducted at the AGE Drainage Ditch. This investigation was conducted to determine whether toxic soils existed and, if so, to assist Cannon AFB in the proper removal and disposal of the soils. The investigation consisted of hand-augering 15

shallow boreholes in the most discolored portion of the ditch to a depth of 2 feet. Soil samples were collected for chemical analysis for total lead, petroleum hydrocarbons, toxicity characteristics, metals, and VOCs.

A total of 22 samples were submitted for analysis. Total lead and petroleum hydrocarbon levels in the upper 0.5-foot of soil exceeded background concentrations. When compared to a sample collected outside of the AGE Drainage Ditch, the elevated levels of lead and petroleum hydrocarbons were reported to correlate with visible soil discoloration observed during sampling. Results of toxicity analysis of the shallow soil samples collected during the 1987 investigation indicated elevated levels of lead and extremely low or nondetectable levels of other metals. Based on this information, the soils were defined as non-hazardous. No VOCs were reported in the shallow soil samples, with the exception of methylene chloride, which was attributed to laboratory contamination.

As recommended in a Phase IV-A investigation report for the AGE Maintenance Pad, the drainage ditch soil was tilled in October 1988. This tilling provided aeration to the soil aiding microbial degradation of contaminants and providing better conditions for renewed vegetation growth.

- 1989 Cannon AFB RCRA Part B Permit:

  The AGE Drainage ditch is identified in the 1989 Cannon AFB RCRA Part B Permit as a high priority site requiring an RFI. Because of the corrective action precedent established by the HSWA, the procedures of the CERCLA IRP approach, including investigations and/or Remedial Actions for all Cannon AFB IRP sites identified as SWMUs, were changed to meet the applicable requirements of the HSWA under the RCRA Corrective Action Plan.

- 1992 RI:

  The purpose of the 1992 Remedial Investigation conducted from October to December 1991 was to verify elevated levels of lead and polycyclic aromatic hydrocarbons (PAHs) and to assess the downward migration potential of the contaminants at the AGE Drainage ditch. No VOCs were detected during the investigation, consistent with the 1984-1985 Phase II Investigation. TRPH was elevated in one subsurface soil. Cadmium, chromium, iron, and copper were detected above background but below regulatory levels. No SVOCs were found above regulatory levels, but PAHs were present at low levels and appeared to have decreasing concentrations from the surface to 3 feet bgs.

  As part of the RI, a risk assessment was conducted for the COPCs. All hazard indices for subchronic and chronic exposures to site contaminants fell below the U.S. Environmental Protection Agency (USEPA) level of concern (1.0) for noncarcinogenic health effects. Carcinogenic risks were not calculated because none of the COPCs identified at the site were carcinogenic chemicals. The ERA identified lead and zinc as chemicals of potential ecological concern (COPECs); however, none of the COPEC metals were shown to pose a risk to small mammalian populations based on calculated toxicity values for incidental soil ingestion. In addition, neither of these metals is known to bioaccumulate through the food chains to levels that would pose a risk to predator species. No unacceptable human health

or ecological risks due to chemical releases were expected from this site and no further action was recommended.

The BRA assessed potential adverse human health and ecological effects by comparing analytical data to risk-based RFI criteria and proposed RCRA action levels, and by calculating site-specific health risks, where appropriate. The BRA concluded potential impacts to human health and to the environment were insignificant at the AGE Drainage Ditch.

- 2007 RFI:

  A CSM was developed based on historical site information. Based on localized topography and site conditions, two primary release mechanisms by which COPCs could potentially be released from the sire were identified: 1) inhalation of VOCs or fugitive dust and 2) direct contact with soil.

  Additionally, the results and conclusions of previous investigations were re-evaluated using appropriate methods and screening criteria. With the exception of TRPH and lead, which both exceed residential screening levels in near surface soils, no COPCs were identified for the general site worker and construction worker land use scenarios applicable to this site. No unacceptable ecological risks were identified during previous investigations or associated risk evaluations. Additional sampling to further characterize the lateral extent of elevated TRPH and lead concentrations was recommended.

- 2008 RFI Approval With Direction:

  In May 2008, the NMED issued an approval letter for the 2007 RFI with stipulations for numerous sites, including the AGE Maintenance Pad.

- 2010 RFI Addendum:

  Based on the previously reported elevated TRPH and lead results, the RFI Addendum additional fieldwork was conducted to further characterize the lateral extent of elevated TRPH and lead concentrations. Eight near surface soil samples (0 to 2 feet bgs) were collected from six soil borings near the previous sampling locations with TRPH or lead levels above NMED SSLs. With the exception of lead which exceeded residential screening levels in the 6 to 12-inch interval at one near surface soil location, no additional elevated lead or TRPH levels were determined from analytical results. Based on the findings of the 2008 RFI Addendum fieldwork, the elevated TRPH that was identified by previous investigations was no longer observed at the site. The decrease in the TRPH levels can likely be attributed to natural attenuation of TRPH in the soil. Elevated lead was observed above the NMED residential SSL, but below the industrial NMED SSLs in two soil samples collected during all investigations. Because lead was not detected above industrial screening levels, CAC with Controls was recommended.

- 2010 Final RFI Addendum:

  The May 2010, Final RFI Addendum Report was approved by the NMED on June 7, 2010.

2.4.2.2 Current

- Annual site inspection and report submitted to NMED
- Exit Strategy and Timelines: LUCs in effect in perpetuity

2.4.2.3 Future

- Continue site inspections to ensure compliance with ICs.

2.5 Site SD-17 (SWMU-96) – Entomology Rinse Area

The Entomology Rinse Area is a former drain pit located behind the former pesticide storage building (Building 2160). Coordinates for the approximate center of the site are Latitude 34°23′21.13″ N and Longitude 103°18′17.09″ W.

2.5.1 Site Description and History

2.5.1.1 Physical Setting

The Entomology Rinse Area is located behind the former pesticide storage building (Building 2160) in the east-central portion of Cannon AFB, north of the wastewater lagoons and west of Perimeter Road (Figure 6). As of the October 2012 site inspection, the area exists as a flat gravel covered parcel with sparse vegetation in front of the Cannon AFB Water Treatment plant.

2.5.1.2 History

The Entomology Rinse Area drain pit was associated with a former pesticide storage building. The building was abandoned in October 1983 and demolished in September 1984. When in use, the building contained a sink used for rinsing pesticide equipment and storage containers. Rinse water from the sink drained into a small open pit, reportedly 3 feet square by 2 feet deep. The exact years of operation are not known, however it is suspected to have become active in 1968, or earlier.

2.5.2 Summary of ERP Activities

2.5.2.1 Past

- 1982-1983 IRP Phase I:

  In 1982-1983 a records search including a detailed review of pertinent installation records, contact with government agencies, and site visits to identify and fully evaluate suspected problems associated with past hazardous material disposal sites was performed. Results of the records search identified several sites on Cannon AFB which warranted further investigation. The Entomology Rinse Area was designated as IRP Site Number 17.

- 1984-1985 IRP Phase II:

  A Phase II (Stage I) investigation conducted from November 1984 to April 1985 was conducted to determine if environmental contamination had resulted from waste disposal practices, fuel spills/leaks, and fire training activities at Cannon AFB. In addition, the investigation included an estimate of the magnitude and extent of contamination, the identification of potential environmental consequences of migrating pollutants; and the

recommendation for any additional investigation necessary to identify the magnitude, extent, and direction of movement of discovered contaminants.

The Phase II (Stage I) investigation consisted of three deep soil borings, approximately 60 feet deep in the area of the former drain pit. Samples were collected in the zones above the caliche, approximately 5 feet into the caliche, and at the bottom of the borehole below the last significant caliche profile. Samples were analyzed for arsenic, mercury, herbicides, pesticides, and VOCs. None of the samples contained detectable levels of VOCs or organophosphate pesticides. Arsenic and mercury concentrations measured were generally low and within the range of common and background soils. The topsoil in the Entomology Rinse Area contained elevated levels of pesticides near two of the borings. Measurable amounts of pesticides and herbicides were detected at 62 feet (below the caliche profile) in one boring; indicating that pesticides and herbicides had potentially accumulated in the underlying unconsolidated silty sands below the caliche profile. Further soil sampling and site cleanup was recommended.

- 1986 Phase IV-A Field Investigation:

  Phase IV-A investigations conducted in November and December 1986 included surface and subsurface soil, sewage lagoon sediment and surface water, and groundwater sampling and analyses.

  During Phase IV-A, eight borings were drilled in the Entomology Rinse Area. In addition, a 356-foot deep monitoring well was installed downgradient to determine groundwater conditions. The Phase IV-A borings were sampled at designated intervals from 0 to 10 feet, and at 10 foot intervals from 10 to 50 feet. In addition, four deep borings were sampled every 10 feet from 50 to 100 feet.

  Phase IV-A investigations indicated that conditions at the site are not conducive to downward migration, that no herbicides were present at the site, and that only four pesticides were present at shallow depths. The pesticides were present at almost all boring locations at the 0.5-foot sample depth, with decreasing concentrations thereafter. Most borings indicated contamination to a depth of 1.0-foot, and only one boring, in close proximity to the location of the pit, contained pesticides to a depth of 6.0-feet.

- 1987 RFA/SI:

  Visual site inspections were performed in May 1987 to verify and determine the location of all SWMUs on Cannon AFB as required for RCRA hazardous waste management facility permitting under the RCRA HSWA of 1984. The objective of the evaluation was to determine whether there had been, or was likely to be, release of hazardous wastes or hazardous materials and to provide information to establish priorities for a subsequent RFI, if needed. No samples were taken during the 1987 inspection.

  The Entomology Rinse Area was designated as Appendix I SWMU-96, and due to the potential for soil and groundwater contamination, further investigation was recommended.

- 1988 Environmental Assessment:

  The 1988 Environmental Assessment suggested that the site conditions, as reported from the Phase IV-A investigation, do not pose a significant impact to the environment. The only feasible pathways of chemical constituent migration would be through fugitive dust generation. Based on the results of the field investigations, site characteristics, and physical/chemical characteristics of the pesticides, groundwater contamination has not been observed and is not anticipated. The report concluded that the pesticides may, by design, affect the insect population upon exposure, however, existing conditions at the Entomology Rinse Area were within current regulatory requirements.

- 1991 RI:

  A Remedial Investigation was conducted at the Entomology Rinse Area from October through November 1991. The objective of additional sampling was to provide data regarding the extent of potential hazardous contaminants in the surface soil near the Entomology Rinse Site and in the groundwater downgradient of the site for assessment purposes. Activities included the collection of one soil sample and one groundwater sample from monitoring well MW-K. The soil sample was analyzed for PCBs and pesticides and the groundwater sample was analyzed for PCBs, pesticides, and total metals. No PCBs were detected in soil and detected pesticides were at estimated concentrations below regulatory action levels. No PCBs or pesticides were found in the groundwater sample. Six metals were detected above detection limits but below the corresponding regulatory levels.

- 1994 Supplemental RFI:

  The objective of the Supplemental RFI was to collect additional data requested by USEPA to define the deeper soil beneath the suspected rinse sink pit location. One soil boring was drilled to 102 feet and samples were collected at 10-foot intervals starting at 10 feet bgs. The soil samples were analyzed for VOCs, SVOCs, PCBs, TAL metals, TRPH, and pesticides. Two pesticides (4,4-DDE and 4,4-DDT) were detected at 10 feet bgs in the duplicate samples but were not detected from 10 to 100 feet bgs. The concentrations of pesticides were lower than the RCRA corrective action levels and lower than concentrations detected at other SWMUs, unrelated to pesticide use. Low concentrations of acetone, methylene chloride, toluene, and TRPH were detected in samples from multiple depths. However the levels detected were well below the corrective action levels and were attributed to laboratory contamination. Seventeen metals were detected within the range of naturally occurring background levels.

- 2007 RFI:

  A CSM was developed based on historical site information. Based on localized topography and site conditions, two primary release mechanisms by which COPCs could potentially be released from the site were identified: 1) direct contact during soil disturbance or excavation activities and 2) infiltration to groundwater affecting the potable water supply.

  Additionally, the results and conclusions of previous investigations were re-evaluated using appropriate methods and screening criteria. None of the pesticides or metals detected

above the reporting limits exceeded the industrial or construction worker SSLs. Arsenic and mercury exceeded soil-to-groundwater SSLs; however, impacts to groundwater are considered minimal because the depth to groundwater was greater than 250 feet. Although arsenic concentrations exceeded the residential SSL, arsenic was not considered a COPC. The slightly elevated arsenic concentrations were within the range of background levels, and were associated with a subsurface soil sample. Low concentrations of arsenic detected in groundwater samples was likely due to naturally occurring arsenic, and not activities associated with the site. No unacceptable ecological risks were identified during previous investigations or risk evaluations.

- 2010 Corrective Action Complete Proposal:

  In March 2010 a CAC Proposal considering all results and conclusions was compiled. Due to concentrations of arsenic and mercury exceeding general soil-to-groundwater SSLs, site-specific soil-to-groundwater SSLs were calculated. The site specific calculations resulted in an acceptable dilution/attenuation factor (DAF).

  The proposal concluded that CAC with Controls is appropriate for the site because the building has been removed, the SWMU has been adequately characterized in accordance with applicable regulations, and the available data indicated that contaminants pose an acceptable level of risk under current and projected land use.

- 2011 Corrective Action Complete:

  On February 23, 2011, the NMED granted Corrective Action Complete with Controls.

2.5.2.2 Current

- Annual site inspection and report submitted to NMED
- Exit Strategy and Timelines: LUCs in effect in perpetuity

2.5.2.3 Future

- Continue site inspections to ensure compliance with ICs.

2.6 Site SD-20 (SWMU-95) – Northeast Stormwater Ditch

The Northeast Stormwater Ditch is a shallow open ditch that begins near the end of the northeastern runway (4/22) and extends to the southeast as a culvert under an access road before emptying into an open field (Figure 7). The culvert lies approximately 1,570 ft west of Perimeter Road and the coordinates are Latitude 34°23′27.15″ N and Longitude 103°18′33.41″ W.

2.6.1 Site Description and History

2.6.1.1 Physical Setting

The Northeast Stormwater Ditch was a natural depression area and has been transformed into a shallow open ditch approximately 1,150 feet long and 40 feet wide. The culvert under the

access road lies approximately 3,500 feet west of the Base's eastern boundary fence and 4,750 feet south of the Base's northern boundary fence.

As of the October 2012 site inspection, the site consists of a concrete culvert, an open field area covered with prairie grass, and other areas with noticeably green thick grasses of differing species.

2.6.1.2 History

The site has received stormwater runoff from runways since 1953 and began receiving wash water from the maintenance shops and hangars on the northwest side of the runway in 1969. Expected chemicals would include the water from oil/water separators, alkaline based aircraft cleaning compounds, and other chemicals used on the flight line or in hangars. Runoff flow is discharged to an open area to the southeast of the access road.

2.6.2 Summary of ERP Activities

2.6.2.1 Past

- IRP:

  The Northeast Stormwater Ditch was not included on the original record from 1982-83, but was later designated as IRP Site Number 20.

- 1987 RFA/SI:

  In May 1987 visual site inspections were performed to verify and determine the location of all SWMUs on Cannon AFB as required for RCRA hazardous waste management facility permitting under the RCRA HSWA of 1984. The objective of the evaluation was to determine whether there had been, or was likely to be, release of hazardous wastes or hazardous materials and to provide information to establish priorities for a subsequent RFI, if needed. No samples were taken during the 1987 inspection.

  The Northeast Stormwater Ditch was designated as Appendix I, SWMU-95, and due to the potential for soil contamination, further investigation was recommended at the conclusion of the assessment.

- 1990 RI:

  In 1989, an investigation was conducted to assess site conditions. Boreholes and sampling were conducted along the length of the drainage channel and in the discharge receiving area. Samples were collected from 11 soil borings at depths ranging from 0 to 61.5 feet bgs. The objective was to determine if runoff from the flight line and/or water received from several oil/water separators had impacted the stormwater drainage area. Samples were analyzed for TAL metals, TRPH, SVOCs, and VOCs.

  Long chain organics were detected at a shallow depth in one soil boring near the northwest end of the drainage ditch. Selenium and barium were detected in concentrations above site-specific background concentrations, but within the range of concentrations typical of regional soils.

In addition, site conditions were modeled to determine if contaminants would reach groundwater. Model results confirmed organics would not be expected to migrate and consequently threaten or harm resources, populations, or the environment.

- 1992 Remedial Investigation:

  An additional investigation was conducted in 1992 to assess the nature and extent of contaminants northwest of the site. Two soil borings were drilled and sampled to maximum depths of 10 feet bgs. The soil borings were obtained upstream of the Northeast Stormwater Ditch to evaluate possible contaminant contributions from areas upstream of the ditch. Samples were analyzed for VOCs, SVOCs, TAL metals, and TRPH.

  Low concentrations of VOCs and SVOCs were detected but dismissed as common laboratory contaminants and not deemed indicative of site contamination. High molecular weight saturated hydrocarbons were detected in the TRPH analysis for the two surface soil samples, but were not detected in subsurface samples. No metals of concern were identified in subsurface samples.

  A BRA was completed based on site data. Lead and zinc were identified as the only COPCs for human health risk evaluation. Calculated risk to human health for non-carcinogenic and carcinogenic risks indicated no unacceptable risk and no unacceptable ecological risks were identified.

- 2007 RFI:

  A CSM was developed based on historical site information. Based on localized topography and site conditions two primary release mechanisms by which COPCs could potentially be released from the site were identified: 1) direct contact during soil disturbance or excavation activities and 2) infiltration to groundwater affecting the potable water supply.

  Additionally, the results and conclusions of previous investigations and risk assessments were re-evaluated using current methods and screening criteria. With the exception of arsenic, no COPCs were identified for the construction worker scenario applicable to the site. No unacceptable ecological risks were identified during previous investigations or associated risk evaluations. However, additional near surface and subsurface soil samples were recommended for arsenic analysis.

- June 2009 RFI Addendum:

  In response to the recommendations of the 2007 RFI, an additional soil investigation was conducted in June 2009. Four soil borings were advanced to 15 feet bgs in the northeast stormwater drainage area. Samples were submitted to the laboratory based on XRF field screening results. Three samples from each boring location were submitted to the laboratory for arsenic analysis. Arsenic was detected in all samples. Arsenic concentrations in near surface soils exceeded both the NMED residential and Cannon background SSLs, but were below the NMED industrial SSL. Subsurface concentrations were below the NMED SSLs. Due to the maximum arsenic concentration being between the NMED residential and industrial SSLs, CAC with Controls was recommended for SWMU-95.

- May 2010 Revised RFI Addendum:

  The Revised RFI Addendum Report did not change the conclusions and recommendations drawn by the June 2009 RFI Addendum.

2.6.2.2 Current

- Annual site inspection and report submitted to NMED
- Exit Strategy and Timelines: LUCs in effect in perpetuity

2.6.2.3 Future

- Continue site inspections to ensure compliance with ICs.

2.7 SWMU-2 – Recovered Diesel Tank No. 108

Recovered Diesel Tank No. 108 was located near former Hangar 108 in the west central portion of the Base (Figure 8). It is located adjacent to southwest-northeast runway, approximately 330 feet southeast of Torch Boulevard. Coordinates for the approximate center of the site are Latitude 34°23′15.52″ N and Longitude 103°19′36.70″ W.

2.7.1 Site Description and History

2.7.1.1 Physical Setting

Recovered Diesel Tank No. 108 was a 2,000-gallon underground storage tank (UST) that supplied diesel fuel heating oil to Hangar 108. Hangar 108 was located approximately 3,000 feet east of the Base's western boundary fence and 6,200 feet south of the Base's northern boundary fence. As of the October 2012 site inspection, the site is covered by Hangar 125.

2.7.1.2 History

The tank was believed to have been in service beginning in 1943 and was removed from the ground during the demolition of Hangar 108 in 1989. According to 1987 documentation, the UST was described as a recovered diesel storage tank connected to an oil-water separator. Under that designation the site was added to the 1989 RCRA Permit as an Appendix II Site. However, further investigation corrected the original finding and indicated that the tank was a reservoir for heating oil.

2.7.2 Summary of ERP Activities

2.7.2.1 Past

- 1987 RFA/SI:

  Visual site inspections were performed in May 1987 to verify and determine the location of all SWMUs on Cannon AFB as required for RCRA hazardous waste management facility permitting under the RCRA HSWA of 1984. The objective of the evaluation was to determine whether there had been, or was likely to be, release of hazardous wastes or hazardous materials and to provide information to establish priorities for a subsequent RFI if needed.

Recovered Diesel Tank No. 108 was designated as Appendix II, SWMU-2.

- 1989 Hangar 108 Demolition:

  Hangar 108 was demolished and replaced with Hangar 125 in 1989. During demolition, the 2,000-gallon heating oil tank was removed and the former tank location was covered with the concrete floor of the new hangar. No documentation concerning conditions of the tank or surrounding soils at the time of the UST removal was found. No documentation concerning an investigation into possible contamination at the site was found.

- 2007 RFI:

  Because documentation of previous site conditions was not available, a field investigation was completed. Institutional knowledge and drawings rendered in support of demolition were used to locate the former location of the heating oil UST. Drill rigs accessed the subsurface through the concrete floor of Hangar 125. Four borings were completed to depths of 15 and 16 feet bgs. Nine soil samples were collected at 8 to 10 feet bgs and from the 13 to 15 feet bgs depth intervals and submitted for laboratory analysis for individual fuel oil constituents (VOCs, SVOCs, and TAL metals).

  No VOCs or SVOCs were detected above the reporting limits in any of the samples. Selenium and sodium were not detected above the reporting limits in any of the samples and none of the metals exceed the construction worker SSLs. The maximum concentration of arsenic in subsurface soil exceeded the soil-to-groundwater SSL and the residential SSL. The maximum concentrations of iron, mercury, and thallium exceed the soil-to-groundwater SSLs. However, impacts to groundwater are considered minimal because the depth to groundwater is greater than 250 feet and soil sampling results do not indicate metals are being transported significantly in a vertical direction.

  A CSM was developed based on current and historical site information. Under current use, direct contact with subsurface soils is an incomplete exposure pathway because the area sampled is located under the hangar concrete floor and no contact occurs at the depths sampled. It is unlikely that future construction would occur at the hangar. In addition, any contamination that may be associated with the site is likely to be present at depths greater than typical construction activities (i.e., greater than 10 feet bgs). Although exposure to the subsurface soil is unlikely, it was evaluated in the event that site conditions change significantly and the subsurface soils are disturbed, mixed with surface soils, and/or exposed. The most significant exposure pathway is direct contact with the soil, resulting in incidental ingestion or dermal absorption of chemicals from soil over a short duration and frequency. Human receptors for this pathway are limited to construction workers. Future industrial or residential exposure is unlikely because the potential for major soil excavation and future construction of buildings or residential homes within this site is low.

  The primary release mechanisms by which COPCs could be released from the site are by direct contact during soil disturbance or excavation activities and by infiltration to groundwater affecting the potable water supply. The data used for screening against SSLs were limited to samples collected from the 8- to 15-foot bgs depth intervals. Based on the

evaluation of site concentrations, the location of the detected concentrations, and potential receptors, Cannon AFB petitioned that the site be considered for Corrective Action Complete without Controls status.

- 2008 NMED Approval to seek CAC with Controls:

  Due to the hazardous constituents detected at the Recovered Diesel Tank No. 108 Site being between residential and industrial NMED SSLs, the NMED approved the right to petition for Corrective Action with Controls.

- 2011 NMED Approved CAC with Controls:

  One February 23, 2011, NMED approved the site for Corrective Action with Controls.

2.7.2.2 Current

- Annual site inspection and report submitted to NMED
- Exit Strategy and Timelines: LUCs in effect in perpetuity

2.7.2.3 Future

- Continue site inspections to ensure compliance with ICs.

2.8 SWMU-4 – Recovered Diesel Tank No. 121

Recovered Diesel Tank No. 121 was a 2,000-gallon UST that supplied heating oil to Hanger 121. The tank was located near former Hangar 121 in the west central portion of the base (Figure 8). Coordinates for the approximate center of the site are Latitude 34°23′17.86″ N and Longitude 103°19′34.18″ W.

2.8.1 Site Description and History

2.8.1.1 Physical Setting

Recovered Diesel Tank No. 121 was located adjacent to southwest-northeast runway, approximately 340 feet southeast of Torch Boulevard. As of the October 2012 site inspection, the site is covered by Hangar 126.

2.8.1.2 History

The recovered diesel tank was believed to have been in service beginning in 1943 and was removed from the ground during the demolition of Hangar 121 in 1989. According to 1987 documentation, the UST was described has a recovered diesel storage tank connected to an oil-water separator. Under that designation the site was added to the 1989 RCRA Permit as an Appendix II Site. However, further investigation corrected the original finding and indicates that the tank was a reservoir for heating oil.

2.8.2 Summary of ERP Activities

2.8.2.1 Past

- 1987 RFA/SI:

Visual site inspections were performed to verify and determine the location of all SWMUs on Cannon AFB as required for RCRA hazardous waste management facility permitting under the RCRA HSWA of 1984. The objective of the evaluation was to determine whether there had been, or was likely to be, release of hazardous wastes or hazardous materials and to provide information to establish priorities for a subsequent RFI if needed.

Recovered Diesel Tank No. 121 was designated as Appendix II, SWMU-4.

- 1989 Hangar 121 Demolition:

  Hangar 121 was demolished and replaced with Hangar 126 in 1989. During demolition, the 2,000-gallon heating fuel tank was removed and the former tank location was covered with the concrete floor of the new hangar. No documentation concerning conditions of the tank or surrounding soils at the time of the UST removal was found. No documentation concerning an investigation into possible contamination at the site was found.

- 2007 RFI:

  Because documentation of previous site conditions was not available, a field investigation was completed. Institutional knowledge and drawings rendered for demolition contracting were used to locate the former location of the heating oil UST. Drill rigs accessed the subsurface through the concrete floor of Hangar 126. Four borings were completed to depths of 16 feet. Ten soil samples were collected at the 8 to 10 feet bgs and the 13 to 15 feet bgs depth intervals and submitted for laboratory analysis for individual fuel oil constituents: VOCs, SVOCs, and TAL metals. No VOCs or SVOCs were detected above the reporting limits. Arsenic, copper, selenium, silver, and thallium were not detected above the reporting limits in any of the samples and none of the metals exceed the construction worker SSLs. Iron and mercury exceed the soil-to-groundwater SSL, but both were below site-specific background levels. Impacts to groundwater were considered minimal because the depth to groundwater is greater than 250 feet and soil sampling results do not indicate that metals are being transported significantly in a vertical direction.

  A CSM was developed based on current and historical site information. Under current use, direct contact with subsurface soils is an incomplete exposure pathway because the area sampled is located under the hangar concrete floor and no contact occurs at the depths sampled. It is unlikely that future construction would occur at the hangar. In addition, any contamination that may be associated with the site is likely to be present at depths greater than typical construction activities (i.e., greater than 10 feet bgs). Although exposure to the subsurface soil is unlikely, it was evaluated in the event that site conditions change significantly and the subsurface soils are disturbed, mixed with surface soils, and/or exposed. The most significant exposure pathway is direct contact with the soil, resulting in incidental ingestion or dermal absorption of chemicals from soil over a short duration and frequency. Human receptors for this pathway are limited to construction workers. Future industrial or residential exposure is unlikely because the potential for major soil excavation and future construction of buildings or residential homes within the subsurface of the site is low.

Based on comparison of current maximum site soil concentrations with current applicable human health-based SSLs, no COPCs were identified for the exposure scenario applicable to this site. The available data indicate the chemicals present do not pose an unacceptable level of risk under current and projected future land uses.

- 2008 NMED Approval to seek CAC with Controls:

  Due to the hazardous constituents detected at the Recovered Diesel Tank No. 121 Site being between residential and industrial NMED SSLs, the NMED approved the right to petition for CAC with Controls.

- 2011 NMED Approved CAC with Controls:

  On February 23, 2011, NMED approved the site for CAC with Controls.

2.8.2.2 Current

- Annual site inspection and report submitted to NMED
- Exit Strategy and Timelines: LUCs in effect in perpetuity

2.8.2.3 Future

- Continue site inspections to ensure compliance with ICs.

2.9 SWMU-6 – POL Tank No. 129

Petroleum, Oil, and Lubricants (POL) Tank No. 129 was a 2,000-gallon UST that supplied diesel fuel as heating oil to former Hangar 129 located in the west central portion of the Base (Figure 8). Coordinates for the approximate center of the site are Latitude 34°23′21.44″N and Longitude 103°19′30.16″ W.

2.9.1 Site Description and History

2.9.1.1 Physical Setting

POL Tank No. 129 was located adjacent to southwest-northeast runway, approximately 320 feet southeast of Torch Boulevard. Hanger 129 was located approximately 3,600 feet east of the Base's western boundary fence and 5,600 feet south of the Base's northern boundary fence. As of the October 2012 site inspection, the site is covered by asphalt pavement.

2.9.1.2 History

The tank was believed to have been in service beginning in 1943. The tank was relocated approximately 30 feet north when the buildings on the base were converted to natural gas (date not confirmed), and was removed from the latter location in 1992. According to 1987 documentation, the UST was described as a recovered diesel storage tank connected to an oil-water separator. Under that designation the site was added to the 1989 RCRA Permit as an Appendix II Site. However, further investigation corrected the original finding and indicates the tank was a reservoir for heating oil.

2.9.2 Summary of ERP Activities

2.9.2.1 Past

- 1987 RFA/SI:

  Visual site inspections were performed in May 1987 to verify and determine the location of all SWMUs on Cannon AFB as required for RCRA hazardous waste management facility permitting under the RCRA HSWA of 1984. The objective of the evaluation was to determine whether there had been, or was likely to be, release of hazardous wastes or hazardous materials and to provide information to establish priorities for a subsequent RFI if needed.

  POL Tank No. 129 was designated as Appendix II, SWMU-6.

- 1992 Tank Removal:

  The tank was removed from its second location in the ground in 1992 following standard NMED UST removal protocol, including the collection of confirmatory soil samples. The samples submitted for laboratory analysis during the tank removal were analyzed for TRPH and individual fuel oil constituents including methyl tert-butyl ether (MTBE) and benzene, toluene, ethylbenzene, and xylenes (BTEX). Benzene and TRPH were detected in concentrations below the respective residential SSLs in samples collected during tank removal activities.

- 2007 RFI:

  Because sampling had not been conducted at the original site of the UST, institutional knowledge and available drawings were used to locate the approximate former location of the heating oil UST. Four borings were completed to depths of 16 feet. Eight soil samples were collected at the 8 to 10 feet bgs and the 13 to 15 feet bgs depth intervals and submitted for laboratory analysis for individual fuel oil constituents: VOCs, SVOCs, and TAL metals.

  No VOCs or SVOCs were detected above the reporting limits in samples collected during the investigation. No metals exceeded the construction worker SSLs. Arsenic exceeded the residential SSL and arsenic, iron, mercury, and thallium exceed the soil to groundwater SSL; however, all of these but arsenic and thallium were below site-specific background levels. In addition, impacts to groundwater were considered minimal because the depth to groundwater is greater than 250 feet and soil sampling results do not indicate metals are being transported significantly in a vertical direction.

  As part of the RFI, the confirmatory samples collected during the tank removal were re-evaluated using appropriate methods and screening criteria.

  A CSM was developed based on current and historical site information. Under current use, direct contact with subsurface soils is an incomplete exposure pathway because the area sampled is located under the hangar concrete floor and no contact occurs at the depths sampled. It is unlikely that future construction would occur at the hangar. In addition, any

contamination that may be associated with the site is likely to be present at depths greater than typical construction activities (i.e., greater than 10 feet bgs). Although exposure to the subsurface soil is unlikely, it was evaluated in the event that site conditions change significantly and the subsurface soils are disturbed, mixed with surface soils, and/or exposed. The most significant exposure pathway is direct contact with the soil, resulting in incidental ingestion or dermal absorption of chemicals from soil over a short duration and frequency. Human receptors for this pathway are limited to construction workers. Future industrial or residential exposure is unlikely because the potential for major soil excavation and future construction of buildings or residential homes within this site is low. The primary release mechanisms by which COPCs could be released from the site are by direct contact during soil disturbance or excavation activities, and by infiltration to groundwater affecting the potable water supply. The data used for screening against SSLs was limited to samples collected from the 8 to 15 feet bgs depth interval.

Based on comparison of maximum site soil concentrations with applicable human health-based SSLs, no COPCs were identified for the exposure scenario applicable to this site. The available data indicate the chemicals present do not pose an unacceptable level of risk under current and projected future land uses.

Based on the evaluation of site concentrations, the location of the detected concentrations, and potential receptors, Cannon AFB petitioned that POL Tank 129 qualifies for Corrective Action Complete without Controls status. No ecological screening was completed because the site is located in an industrial area near the flightline.

- 2008 NMED Approval to seek CAC with Controls:

  Due to the hazardous constituents detected at the POL Tank No. 129 Site being between residential and industrial NMED SSLs, the NMED approved the right to petition for CAC with Controls.

- 2011 NMED Approved CAC with Controls:

  On February 23, 2011, NMED approved the site for CAC with Controls.

2.9.2.2 Current

- Annual site inspection and report submitted to NMED
- Exit Strategy and Timelines: LUCs in effect in perpetuity

2.9.2.3 Future

- Continue site inspections to ensure compliance with ICs.

2.10 SWMU-31 – AGE Maintenance Shop Pad

The AGE Maintenance Shop Pad was in an open concrete area adjacent to the southeastern side of the former AGE Maintenance Shop in Building 186 (Figure 5). Coordinates for the approximate center of the site are Latitude 34°23′36.07″ N and Longitude 103°19′14.63″ W.

2.10.1 Site Description and History

2.10.1.1 Physical Setting

The AGE Maintenance Shop Pad was approximately 60 to 70 feet wide and 240 to 280 feet long, and was approximately 4,950 feet east of the base's western boundary fence and 4,100 feet south of the base's northern boundary fence. It was located in the north-central portion of the base in close proximity to the flight line. Its former location was approximately 210 feet south of Torch Boulevard. As of the October 2012 site inspection, the site is asphalt or concrete paved and used for parking and storage area.

2.10.1.2 History

The maintenance pad was active from 1971 to 2008. Wash-water associated with former site activities, along with surface and stormwater runoff, flowed off the pad to the southeast and the surrounding area was potentially contaminated with JP-4, oils, and diesel fuel.

2.10.2 Summary of ERP Activities

2.10.2.1 Past

- 1993 Phase I RFI:

  A Phase I RFI was conducted at the site in 1993 to determine the presence and the lateral extent of potential contaminants in soils. Four 10-foot soil borings were drilled and soil samples collected in areas where wash-water from the maintenance pad enters the AGE ditch and along expansion joints or cracks in the maintenance pad. Surface soil staining and vegetation conditions varied across the site.

  Soil samples were collected from the surface and in numerous intervals to the bottom of the borings at 10-feet. Target analytes included VOCs, SVOCs, metals, and TRPH.

  The only VOC reported was an estimated value for tetrachloroethene. Results reported for SVOCs were primarily PAHs. Antimony, barium, cadmium, chromium, cobalt, copper, lead, nickel, selenium, and zinc were detected above background in surface and subsurface samples in one or more borings. Barium, cadmium, chromium, lead, several SVOCs, and petroleum hydrocarbons exceeded the risk screening criteria. Further investigation was warranted.

- 1994 Phase II RFI:

  During the 1994 Phase II RFI, three 10-foot soil borings were completed in supplemental locations across the site to further assess the lateral and vertical presence and extent of site-related soil contaminants at the 0 to10 foot depth interval. Samples were analyzed for VOCs, SVOCs, TAL metals, and TRPH.

  One VOC, several SVOC compounds, mostly PAHs, and TRPH were reported as detections in the near surface samples.

The Phase II RFI concluded that the asphalt present at the site was likely the source of PAHs detected in soil and it is likely that imported fill material present beneath the asphalt and concrete across the site may account for elevated levels of metals.

- 1997 Risk Assessments and Modeling:
  - A Human Health Risk Assessment was conducted using data collected during the Phase I and Phase II RFIs and using the assessment protocol available at that time from the USEPA.
  - The assessment concluded that the primary contaminant source at the AGE Maintenance Pad was waste fluids (e.g., fuels, oils, and solvents) that leaked or were spilled within the AGE maintenance shop pad area, the adjacent wash pad, and the surrounding surface soil. Mixing and infiltration of the wastes with the soil were shown as the primary chemical release mechanism, with direct contact (soil and dermal contact), surface runoff, wind erosion, or volatilization to the atmosphere also given as secondary mechanisms. Potential receptors at the AGE Maintenance Pad include occupational receptors, hypothetical future construction workers, and hypothetical trespassers.
  - An ERA was proposed to be conducted with the available data, however based on assessment protocol, the AGE Maintenance Pad does not contain any significant ecological component and thus a formal ecological risk assessment was not warranted.
  - Vadose Zone Fate and Transport Modeling was accomplished using existing data. The results of the Vadose Zone Fate and Transport Modeling, assuming sorption, dispersion, and biodegradation occur, indicate that chemicals of concern will not reach groundwater at concentrations above associated tap water screening levels.
- 1999 Voluntary Corrective Measures:

  In 1999, soil was removed from the site as part of voluntary corrective measures implemented to achieve closure of the site. During field work performed in February and March of 1999, a 10-ft-by-5-ft-by-2-ft deep excavation was performed at the site. Verification samples were analyzed and concentrations were compared to Cannon AFB background levels and the TRPH action level to confirm cleanup. TRPH was not detected above the method reporting limit in any of the samples. Total lead concentrations exceeded the method reporting limit in only one sample, and total chromium concentrations were detected below background levels. Approximately 4 cubic yards of excavated soil was disposed as non-hazardous soil in a landfill offsite.
- 2007 Corrective Measures Study (CMS):

  Due to soil contamination present at the site, a CMS was required to develop and evaluate corrective measures alternatives and to recommend the selected final corrective measure(s) for the site. The study evaluated previous sampling results, risk assessments, and modeling conducted at the site to develop and evaluate corrective measures alternatives with the intent of selecting the final corrective measure(s) that is most cost-

effective, most reliable, and easiest to implement, while considering technical, human health, and environmental constraints as well as overall cost. The no further action alternative was chosen.

- 2008 Accelerated Corrective Action:

  A Direct Push Technology (DPT) sampling program was conducted in February 2008 across a 20-foot grid to a depth of 15 feet to delineate the extent of soil contamination at the AGE Maintenance Pad and to confirm the levels of TRPH in soil at locations where previous investigations indicated elevated levels of contamination. An action level of 520 milligrams per kilogram (mg/kg) based on NMED TRPH screening guidance was used to determine the extent of contaminated soil requiring remediation at the site. Based on the analytical results for TRPH detected during the 2008 sampling program, exceedances of the TRPH guideline were reported at three soil boring locations. Based on the analytical data and field observations, the report recommended excavating an additional 300 cubic yards of soil.
- 2009 Corrective Action Activities:

  Several field activities in support of additional soil excavation were conducted at the site from February to September 2009. In total, 340 cubic yards of petroleum contaminated soil, 100 cubic yards of concrete debris, and an additional 61 cubic yards of over excavated soils were removed from the site. Confirmation sampling of the original 340 cubic yard excavation and the subsequent excavation were taken to indicate no soils exceeding the screening level (520 mg/kg) remained in the ground.

2.10.2.2 Current

- Annual site inspection and report submitted to NMED
- Exit Strategy and Timelines: LUCs in effect in perpetuity

2.10.2.3 Future

- Continue site inspections to ensure compliance with ICs.

2.11 SWMU-102 – Wastewater Treatment Effluent Discharge

Wastewater Treatment Effluent Discharge (SWMU-102) was an effluent discharge pipe that directed wastewater from the former sewage lagoons (SWMU-101) under Perimeter Road to the self-contained Playa Lake near the central eastern part of the base (Figure 9). Coordinates for the approximate center of the site are Latitude 34°23′09.74″ N and Longitude 103°18′07.19″ W.

2.11.1 Site Description and History

2.11.1.1 Physical Setting

The Wastewater Treatment Effluent Discharge covered a distance of approximately 800 feet from the former sewage lagoons to the playa lake near the eastern border of the base. The

approximate center was approximately 1,800 feet west of the base's eastern boundary fence and 6,300 feet south of the base's northern boundary fence.

As of the October 2012 site inspection, the site appears is an open field covered with prairie grass which is mowed periodically.

2.11.1.2 History

The Wastewater Treatment Effluent Discharge was an integral part of the lagoon wastewater treatment system. Specific dates of operation of the discharge pipe are not found in literature. However, the former sewage lagoons operated from 1966 to 1988, indicating the discharge pipe had a similar usage timeframe. The effluent discharge apparatus consisted of a discharge pipe and an inlet chamber equipped with two slide gates.

2.11.2 Summary of ERP Activities

2.11.2.1 Past

- IRP:

  The Former Sewage Lagoons (SWMU-101) and the Wastewater Treatment Effluent Discharge (SWMU-102) were not included on the original record from 1982-83, but were later designated together as IRP Site Number 21.

- October 2007 RFI:

  Using institutional knowledge, Base records, and engineering drawings, the approximate location of the effluent discharge was located and a field investigation was undertaken in 2007. Four borings were installed to depths of 16 to 17 feet bgs. Soil samples were collected at the 5 to 7 foot bgs depth intervals and at the 15 to 17 foot bgs depth intervals to determine if the lagoon discharge impacted the subsurface soils. Nine soil samples were submitted for laboratory analysis and analyzed for the following chemical constituents: VOCs, SVOCs, pesticides, PCBs, and TAL metals.

  Two VOCs were detected in one sample at a very low concentration and no SVOCs or PCBs were detected above reporting limits. Five pesticides (4,4-DDE, 4,4-DDT, alpha chlordane, gamma chlordane, and gamma-BHC) were detected at levels well below the lowest SSLs. Selenium was not detected above the reporting limit in any of the samples. None of the metals exceed the construction worker SSLs. Arsenic, iron, mercury, and thallium exceed the soil-to-groundwater SSLs but fall below or within the range of site-specific background levels. Impacts to groundwater are considered minimal because the depth to groundwater was greater than 250 feet and soil sampling results did not indicate that metals were being transported significantly in a vertical direction.

  A CSM was developed based on the results of the 2007 RFI Sampling data. Based on localized topography and site conditions two primary release mechanisms by which COPCs could potentially be released from the site were identified: 1) direct contact during soil disturbance or excavation activities and 2) infiltration to groundwater affecting the potable water supply.

The most significant exposure pathway was determined to be direct contact with the soil, resulting in incidental ingestion or dermal absorption of chemicals from soil over a short duration and frequency. Human receptors for this pathway were limited to construction workers. Future industrial or residential exposure was considered unlikely because the potential for major soil excavation and future construction of buildings or residential homes within the site is low.

Based on the evaluation of site concentrations, the location of the detected concentrations, and potential receptors, Cannon AFB believed that the Wastewater Treatment Effluent Discharge qualified for Corrective Action Complete without Controls status. No ecological screening was completed because the site is located in an industrial area. The available data indicate that the chemicals present do not pose an unacceptable level of human health or ecological risk under current and projected future land uses.

- September 2008 CAC Proposal:

  Based on the results of the 2007 RFI, Cannon submitted a request for CAC Status for the site.

- 2010 CAC Proposal:

  In March 2010 a follow-up submittal addressing NMED comments on the CAC proposals was resubmitted for consideration.

2.11.2.2 Current

- Annual site inspection and report submitted to NMED
- Exit Strategy and Timelines: LUCs in effect in perpetuity

2.11.2.3 Future

- Continue site inspections to ensure compliance with ICs.

3 CONCLUSIONS AND RECOMMENDATIONS

During the 2012 Annual inspection of institutional controls at the 11 sites discussed above, no evidence of a violation was observed. The institutional controls will continue to be implemented, enforced, and monitored. The next annual institutional controls inspections are scheduled be conducted in October 2013.

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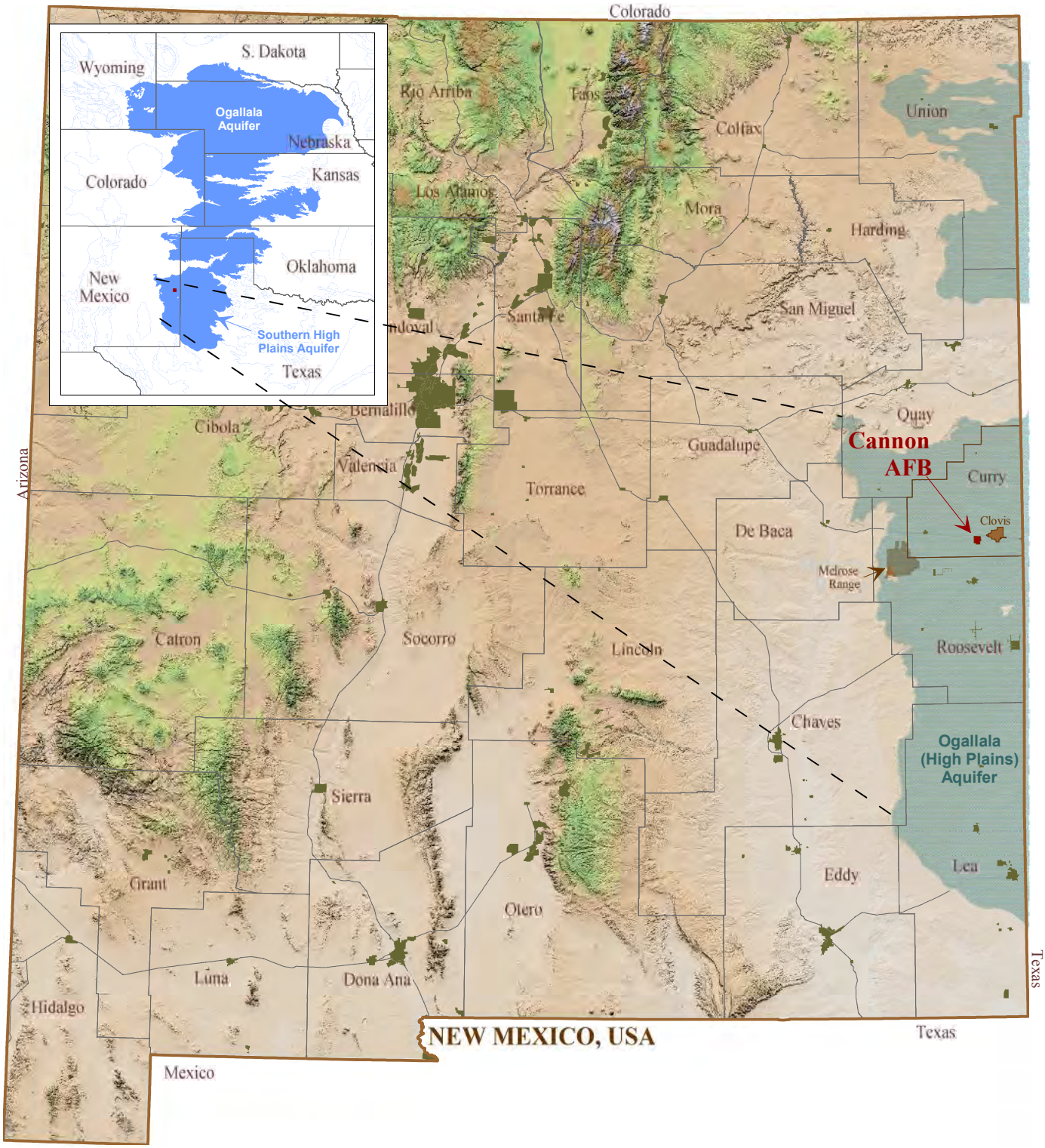
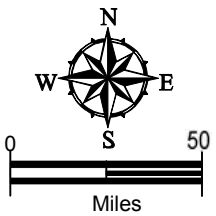
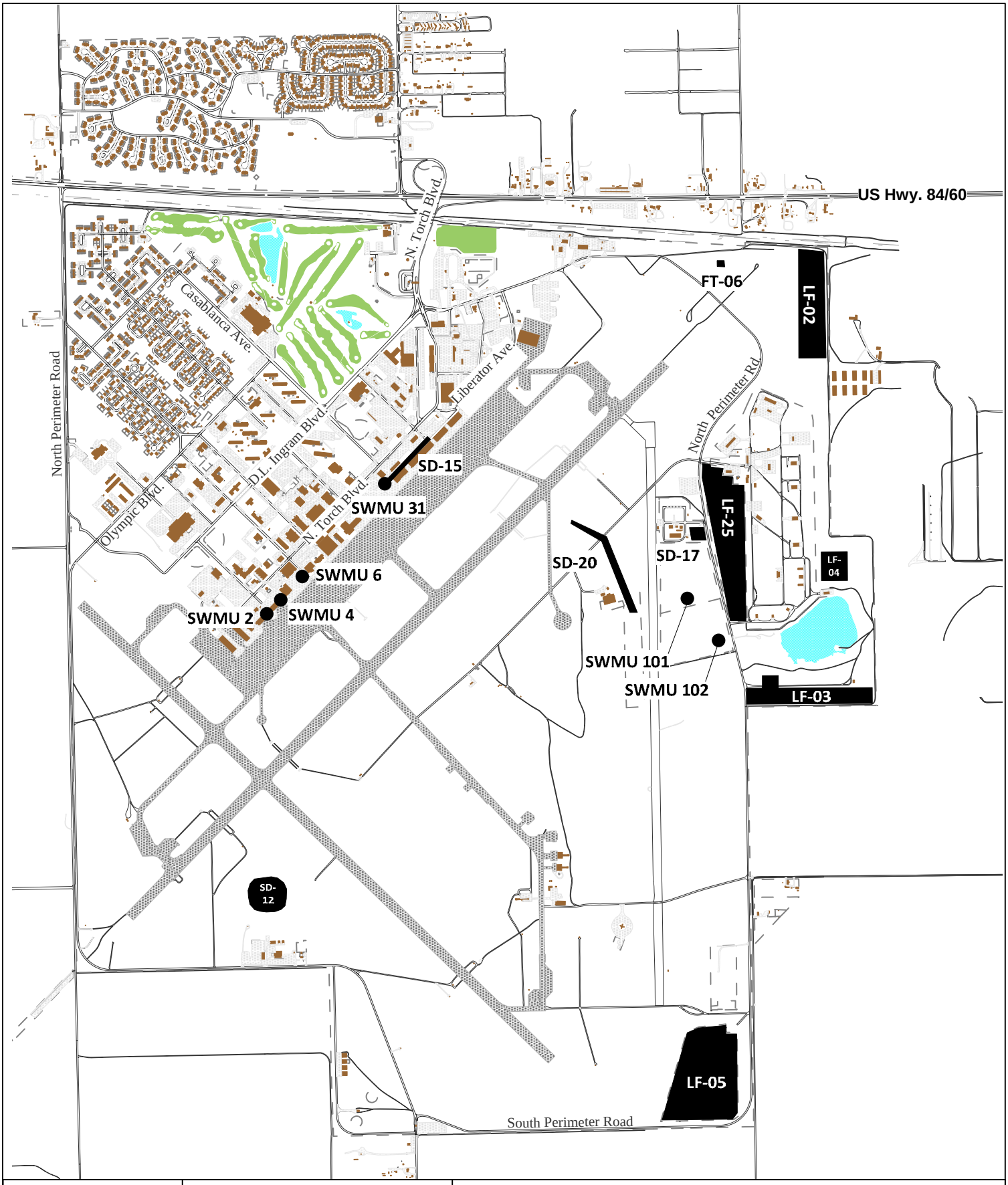
FIGURES





Source files: New Mexico Resource Geographic Information System Program

FIGURE 1
SITE LOCATION MAP
2012 ANNUAL INSTITUTIONAL CONTROLS REPORT
Cannon Air Force Base
Curry County, New Mexico



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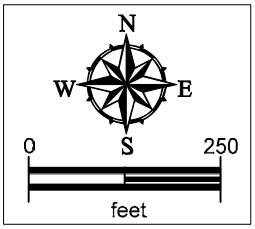
NOTES

Digital data files provided by GeoBase/CAFB
Projection: UTM Zone 13N, NAD 83

FIGURE 2
PLAN VIEW MAP
2012 ANNUAL INSTITUTIONAL CONTROLS REPORT
Cannon Air Force Base
Curry County, New Mexico

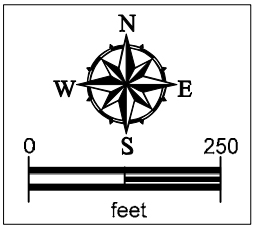
Trinity Analysis & Development Corp.



NOTES

Digital data files provided by GeoBase/CAFB
Projection: UTM Zone 13N, NAD 83

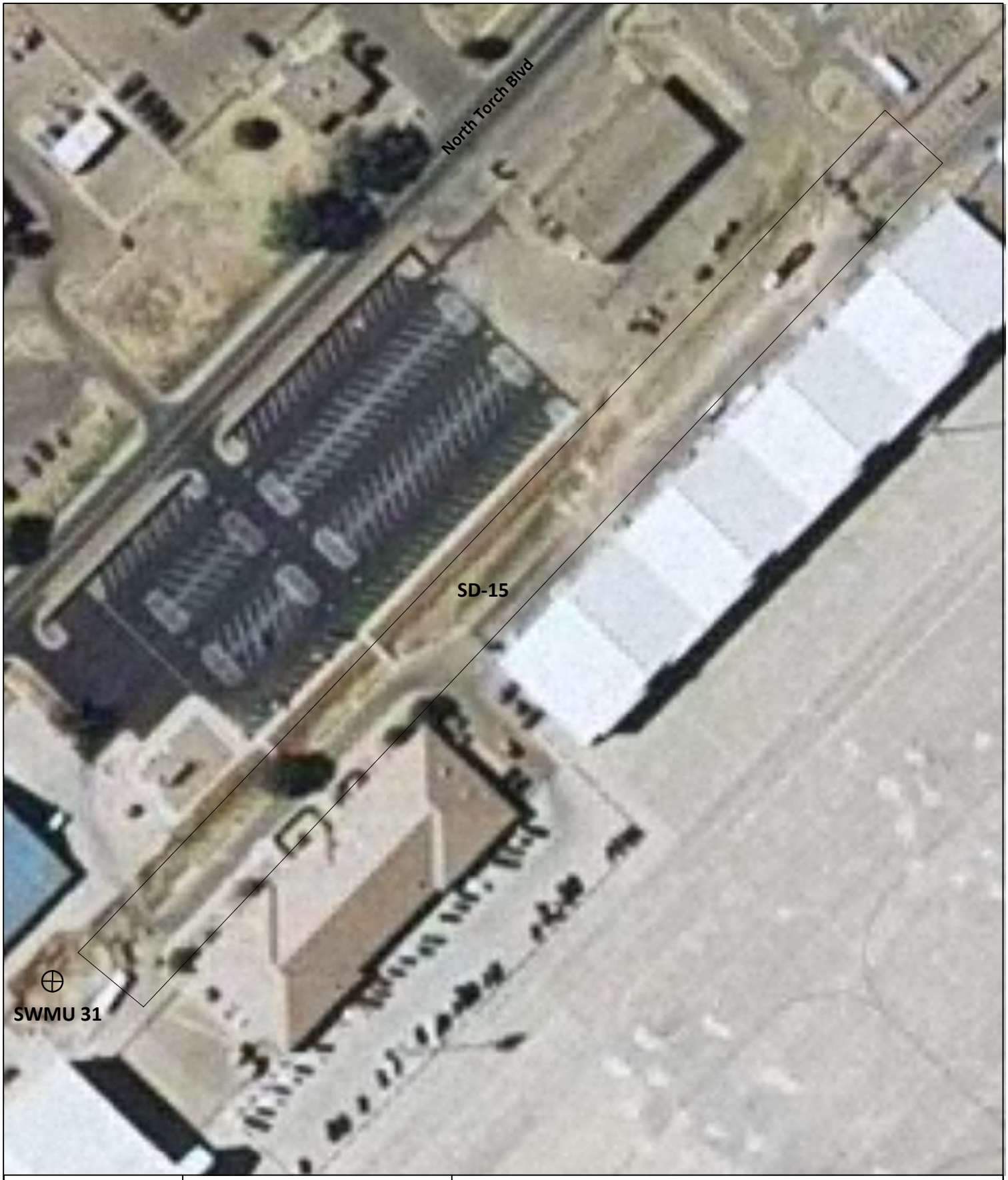
FIGURE 3
2009 AERIAL PHOTOGRAPH - FT-06 & LF-02
2012 ANNUAL INSTITUTIONAL CONTROLS REPORT
Cannon Air Force Base
Curry County, New Mexico

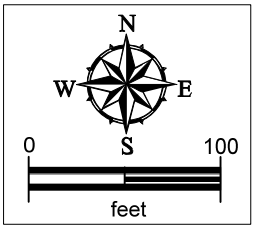


NOTES

Digital data files provided by GeoBase/CAFB
Projection: UTM Zone 13N, NAD 83

FIGURE 4
2009 AERIAL PHOTOGRAPH - SD-12
2012 ANNUAL INSTITUTIONAL CONTROLS REPORT
Cannon Air Force Base
Curry County, New Mexico

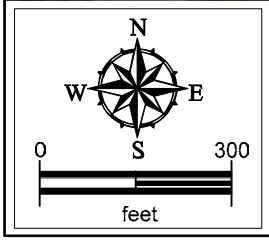




NOTES

Digital data files provided by GeoBase/CAFB
Projection: UTM Zone 13N, NAD 83

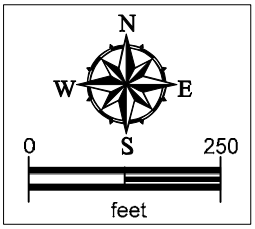
FIGURE 5
2009 AERIAL PHOTOGRAPH - SWMU 31 & SD-15
2012 ANNUAL INSTITUTIONAL CONTROLS REPORT
Cannon Air Force Base
Curry County, New Mexico



NOTES

Digital data files provided by GeoBase/CAFB
Projection: UTM Zone 13N, NAD 83

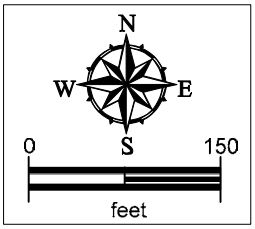
FIGURE 6
2009 AERIAL PHOTOGRAPH - SD-17, LF-25, & SWMU 101
2012 ANNUAL INSTITUTIONAL CONTROLS REPORT
Cannon Air Force Base
Curry County, New Mexico



NOTES

Digital data files provided by GeoBase/CAFB
Projection: UTM Zone 13N, NAD 83

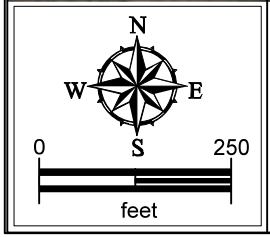
FIGURE 7
2009 AERIAL PHOTOGRAPH - SD-20
2012 ANNUAL INSTITUTIONAL CONTROLS REPORT
Cannon Air Force Base
Curry County, New Mexico



NOTES

Digital data files provided by GeoBase/CAFB
Projection: UTM Zone 13N, NAD 83

FIGURE 8
2009 AERIAL PHOTOGRAPH - SWMU 2, 4, & 6
2012 ANNUAL INSTITUTIONAL CONTROLS REPORT
Cannon Air Force Base
Curry County, New Mexico



NOTES

Digital data files provided by GeoBase/CAFB
Projection: UTM Zone 13N, NAD 83

FIGURE 9
2009 AERIAL PHOTOGRAPH - SWMU 101 & SWMU102
2012 ANNUAL INSTITUTIONAL CONTROLS REPORT
Cannon Air Force Base
Curry County, New Mexico

APPENDIX A
SITE INSPECTION REPORTS

LUC Site Inspection Report

Cannon Air Force Base, Curry County, New Mexico

Site Name: SWMU-102 Date: 10-18-2012

Site Alias: NA Weather: Sunny breezy ~65°F

Location: Between SWMU-101 and the lake

Inspection: Annual Semi-Annual Other:

Current Site Status: CAC CAC w/controls Other:

Curent Land Use Designation: Industrial

Brief Site History: Former waste H2O eff. discharge pipeline

Current Site Configuration: Grassed area across from SWMU-101

Site Conditions: Surface Erosion Exposed Waste Stormwater

Odors Litter Vegetation Cond Good

Monitoring Wells None, closest to MW-P

Other

Signage: Present? NO Condition? NA

Security: Gates/Fences Locks Not Applicable

Notes: (bare areas, tumbleweeds, maintenance or repair needs, erosion, standing water, etc.)

No change since previous inspection

Inspector's Name/Title: Jonathan Kramer Initials: JMK

LUC Site Inspection Report

Cannon Air Force Base, Curry County, New Mexico

Site Name: SWMU-31 Date: 10-18-2012

Site Alias: Weather: sunny breezy ~65°F

Location: One row of bldgs in from flight line, under Bldg 186

Inspection: Annual Semi-Annual Other:

Current Site Status: CAC CAC w/controls Other:

Curent Land Use Designation: Industrial

Brief Site History: AGE Maint. pad

Current Site Configuration: under bldg 186

Site Conditions: Surface Erosion Exposed Waste Stormwater

Odors Litter Vegetation Cond

Monitoring Wells NONE

Other Located w/in fenced enclosure

Signage: Present? NO Condition? NA

Security: Gates/Fences Locks Not Applicable

Notes: (bare areas, tumbleweeds, maintenance or repair needs, erosion, standing water, etc.)

Limited photos

Inspector's Name/Title: Jonathan Kramer Initials: JMK

LUC Site Inspection Report

Cannon Air Force Base, Curry County, New Mexico

Site Name: SWMU-2 Date: 10-18-2012

Site Alias: Weather: sunny breezy ~65°F

Location: Adjacent to Flightline

Inspection: Annual Semi-Annual Other:

Current Site Status: CAC CAC w/controls Other:

Curent Land Use Designation: Industrial

Brief Site History: Former Heating oil UST associated w/ former Hangar 108

Current Site Configuration: New Hangar 125

Site Conditions: Surface Erosion Exposed Waste Stormwater

Odors Litter Vegetation Cond

Monitoring Wells None

Other beneath concrete of New hangar

Signage: Present? No Condition? NA

Security: Gates/Fences Locks Not Applicable

Notes: (bare areas, tumbleweeds, maintenance or repair needs, erosion, standing water, etc.)

No photos taken due to security
same as last year

Inspector's Name/Title: Jonathan Kramer Initials: JMK

LUC Site Inspection Report

Cannon Air Force Base, Curry County, New Mexico

Site Name: SWMU-4 Date: 10-18-2012

Site Alias: Weather: Sunny breezy 65°F

Location: Adjacent to flightline

Inspection: Annual Semi-Annual Other:

Current Site Status: CAC CAC w/controls Other:

Curent Land Use Designation: Industrial

Brief Site History: Former heating oil UST associated w/ former hangar #121

Current Site Configuration: under Hangar # 126

Site Conditions: Surface Erosion Exposed Waste Stormwater

Odors Litter Vegetation Cond

Monitoring Wells NONE

Other bonded concrete of New hangar

Signage: Present? NO Condition? NA

Security: Gates/Fences Locks Not Applicable

Notes: (bare areas, tumbleweeds, maintenance or repair needs, erosion, standing water, etc.)

No photos taken due to security

same as last year

Inspector's Name/Title: Jonathan Kramer Initials: JMK

LUC Site Inspection Report

Cannon Air Force Base, Curry County, New Mexico

Site Name: FT-06 Date: 10/16/17

Site Alias: SWMU-78 Weather:

Location: Northeast of runway, adjacent to concrete pad, between perimeter Rd & R/W lights

Inspection: (Annual) Semi-Annual Other:

Current Site Status: CAC CAC (w/controls) Other:

Curent Land Use Designation: Industrial

Brief Site History: Former fire training area

Current Site Configuration: Flat grassed area, mowed

Site Conditions: Surface Erosion Exposed Waste Stormwater

Odors (Litter) (Vegetation Cond) Dry, healthy same as before

Monitoring Wells None

Other minor metal debris

Signage: Present? NO Condition? NA

Security: Gates/Fences Locks (Not Applicable)

Notes: (bare areas, tumbleweeds, maintenance or repair needs, erosion, standing water, etc.)

NO change from previous

Inspector's Name/Title: Bernstowarz Jonathan Kramer Initials: JMK

LUC Site Inspection Report

Cannon Air Force Base, Curry County, New Mexico

Site Name: SD-20 Date: 10-18-2012

Site Alias: SWMU-95 Weather: Sunny, breezy ~65°F

Location: Between Combat Arms & WWTP

Inspection: Annual Semi-Annual Other:

Current Site Status: CAC CAC w/controls Other:

Curent Land Use Designation: Industrial

Brief Site History: Runway runoff from runway

Current Site Configuration: concrete culvert infall/outfall

Site Conditions: Surface Erosion Exposed Waste Stormwater

Odors Litter Vegetation Cond

Monitoring Wells SW autosampler

Other standing surface H2O green healthy veg.

Signage: Present? NO Condition? NA

Security: Gates/Fences Locks Not Applicable

Notes: (bare areas, tumbleweeds, maintenance or repair needs, erosion, standing water, etc.)

No change from previous inspec.

Autosampler still appears non-functional

Inspector's Name/Title: Initials:

LUC Site Inspection Report

Cannon Air Force Base, Curry County, New Mexico

Site Name: SD-17 Date: 10-18-2012

Site Alias: SWMU-96 Weather: sunny breezy ~60°F

Location: front yard of WWTP / gravel area

Inspection: Annual Semi-Annual Other:

Current Site Status: CAC CAC w/controls Other:

Curent Land Use Designation: Industrial

Brief Site History: Former pesticide storage bldg, sink pit

Current Site Configuration: covered w/ gravel

Site Conditions: Surface Erosion Exposed Waste Stormwater

Odors Litter Vegetation Cond

Monitoring Wells closest well = MW-F

Other

Signage: Present? NO Condition? NA

Security: Gates/Fences Locks Not Applicable

Notes: (bare areas, tumbleweeds, maintenance or repair needs, erosion, standing water, etc.)

NO change from 2011

Inspector's Name/Title: Jonathan Kramer Initials: JMK

LUC Site Inspection Report

Cannon Air Force Base, Curry County, New Mexico

Site Name: LF-02 Date: ~~12-18-~~ 10-18-12

Site Alias: SWMU-02 Weather: Sunny breezy ~65°F

Location: NE corner of base

Inspection: Annual Semi-Annual Other:

Current Site Status: CAC CAC w/controls Other:

Curent Land Use Designation: Industrial

Brief Site History: flat mowed grassy area

Current Site Configuration:

Site Conditions: Surface Erosion Exposed Waste Stormwater

Odors Litter Vegetation Cond good/dry

Monitoring Wells None

Other

Signage: Present? NO Condition? NA

Security: Gates/Fences Locks Not Applicable

Notes: (bare areas, tumbleweeds, maintenance or repair needs, erosion, standing water, etc.)

same as 2011

Inspector's Name/Title: Jonathan Kramer Initials: JKK

LUC Site Inspection Report

Cannon Air Force Base, Curry County, New Mexico

Site Name: SWMU-6 Date: 10-18-12

Site Alias: Weather: sunny breezy ~65°F

Location: Parking lot behind Bldg 116, by flightline

Inspection: Annual Semi-Annual Other:

Current Site Status: CAC CAC w/controls Other:

Curent Land Use Designation: Industrial

Brief Site History: Former heating oil UST

Current Site Configuration: Paved parking between flightline and Bldg 116

Site Conditions: Surface Erosion Exposed Waste Stormwater

Odors Litter Vegetation Cond

Monitoring Wells NA

Other

Signage: Present? No Condition?

Security: Gates/Fences Locks Not Applicable

Notes: (bare areas, tumbleweeds, maintenance or repair needs, erosion, standing water, etc.)

same as 2011

Inspector's Name/Title: Jonathan Kramer Initials: JMK

LUC Site Inspection Report

Cannon Air Force Base, Curry County, New Mexico

Site Name: SD-15 Date: 10-18-2012

Site Alias: SWMU-34 Weather: Sunny breezy ~65°F

Location: Along flightline behind bldgs 190/194

Inspection: Annual Semi-Annual Other:

Current Site Status: CAC CAC w/controls Other:

Curent Land Use Designation: Industrial

Brief Site History: AGE drainage ditch

Current Site Configuration: Stormwater ditch

Site Conditions: Surface Erosion Exposed Waste Stormwater

Odors Litter Vegetation Cond

Monitoring Wells N/A

Other green grass

Signage: Present? NO Condition? NA

Security: Gates/Fences Locks Not Applicable

Notes: (bare areas, tumbleweeds, maintenance or repair needs, erosion, standing water, etc.)

same as 2011

Inspector's Name/Title: Jonathan Kramer Initials: JMK

LUC Site Inspection Report

Cannon Air Force Base, Curry County, New Mexico

Site Name: SD-12 Date: 10-18-2012 JMK

Site Alias: SWMU-85 Weather: Sunny Breezy ~65°f

Location: Rear of dog kennels

Inspection: Annual Semi-Annual Other:

Current Site Status: CAC CAC w/controls Other:

Curent Land Use Designation: Industrial

Brief Site History: Playa lake / flightline runoff

Current Site Configuration:

Site Conditions: Surface Erosion Exposed Waste Stormwater

Odors Litter Vegetation Cond green/good

Monitoring Wells closest well = MW-X

Other

Signage: Present? No Condition?

Security: Gates/Fences Locks Not Applicable

Notes: (bare areas, tumbleweeds, maintenance or repair needs, erosion, standing water, etc.)

Same as 2011 inspection

Inspector's Name/Title: Jonathan Kramer Initials: JMK

APPENDIX B
PHOTOGRAPHIC LOG

Site Photographs

Photo #1
SWMU-2—Corrective Action Complete with Controls. Slightly contaminated soils remain in place beneath the hangar.

Photo #2
SWMU-4—Corrective Action Complete with Controls. Slightly contaminated soils remain in place beneath the hangar.

Photo #3
SWMU-6—Approximate location of former POL Tank 129

Photo #4
SWMU-31—Slightly contaminated soils remain onsite outside the area of the original excavation (under building).

Photo #5
SWMU-34 (SD-15) — Stormwater ditch behind Buildings 191 and 193. Grass healthy. View is to the southwest.

Photo #6
SWMU-34 (SD-15) — Stormwater ditch behind Buildings 191 and 193. Grass healthy. View is to the northeast.

Site Photographs

Photo #7
SWMU-78 (FT-06)—Former fire training area, flat grassed area , mowed with some bare area and limited surface debris.

Photo #8
SWMU-78 (FT-06)—Former fire training area, flat grassed area , mowed with some bare area and limited surface debris.

Photo #9
SWMU-78 (FT-06)—Former fire training area, flat grassed area , mowed with some bare area and limited surface debris.

Photo #10
SWMU-82 (LF-02)—Former landfill. Ground cover very good.

Photo #11
SWMU-82 (LF-02)—Former landfill. Ground cover very good.

Photo #12
SWMU-85 (SD-12)—South Playa Lake

Site Photographs

Photo #13
SWMU-95 (SD-20)—Stormwater collection point from the northeastern end of runway.

Photo #14
SWMU-95 (SD-20)—Stormwater collection point from the northeastern end of runway.

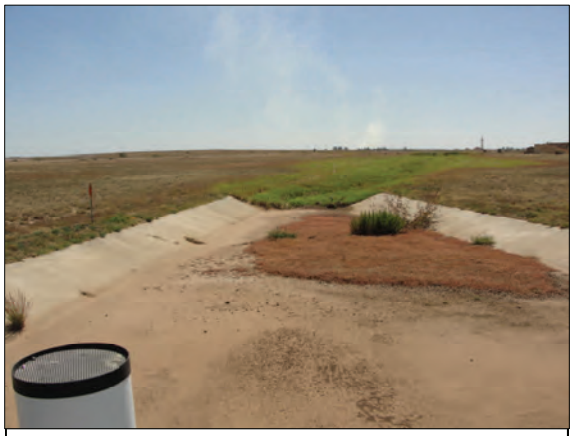


Photo #15
SWMU-95 (SD-20)—Stormwater collection point from the northeastern end of runway.

Photo #16
SWMU-95 (SD-20)—Solar powered surface water autosampler .

Photo #17
SWMU-96 (SD-17)—Gravel covered area in front of wastewater treatment plant.

Photo #18
SWMU-96 (SD-17)—Gravel covered area in front of wastewater treatment plant.

Site Photographs

Photo #19
SWMU-96 (SD-17)—Gravel covered area in front of wastewater treatment plant.

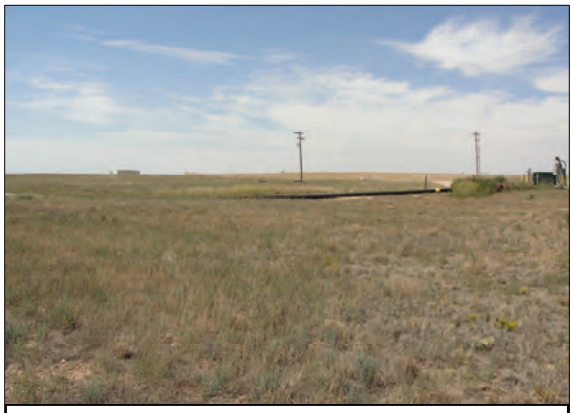


Photo #20
SWMU-102—Former effluent discharge pipeline. Grassed area across from SWMU-101.

Photo #21
SWMU-102—Former effluent discharge pipeline. Grassed area across from SWMU-101.

Photo #22
SWMU-102—Former effluent outfall.